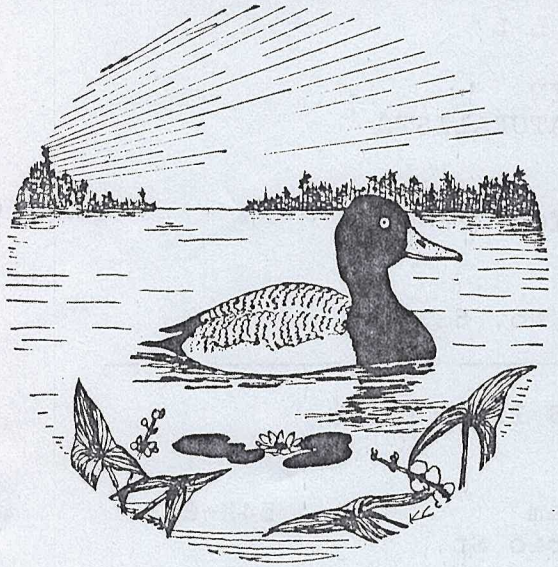

THE BLUE BILL

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EDITOR'S NOTE

The Club's 40th Birthday is one of several significant anniversaries taking place this Fall for naturalists in this area. Less well known is that the Cataraqui Region Conservation Authority was formed 25 years ago, and that its formation was largely a result of the efforts of Dr. Jim McCowan, a former Club President, and the first Chairman of the Authority.

Another milestone to be reached shortly is the 90th Annual Christmas Bird Count in North America. Members of the KFN have participated in this event since 1948 - the year before the Club was founded. Christmas counts, and other surveys carried out by amateur naturalists, serve a number of purposes. Probably their greatest value is that they allow trends in populations to be identified, trends which are often indicative of man-induced changes in the environment.

As in the previous issue of The Blue Bill, an article appears in this issue reminding us that massive and irreparable damage to the environment is occurring in many parts of the world, and that we are at least partly responsible. The article is taken from one of a series of essays on birds and their behaviour written by Adrian Forsyth, a local biologist and author, and published last year in a beautifully illustrated book "The Nature of Birds".

In a recent speech to science teachers in Ottawa, David Suzuki spoke eloquently about the plight of the planet, and portrayed an uncomfortably gloomy picture of what is likely to occur unless the inhabitants of the developed nations reduce their demands for the earth's resources, and make a much greater effort to move towards sustainable development. Politicians are beginning to listen, and if those of us who call ourselves environmentalists will keep the pressure on, perhaps it is not too late to change the picture.

When the KFN celebrates its 50th Birthday, will there still be healthy maple trees in the Otter Lake Sanctuary, and trees filled with Scarlet Tanagers, Rose-breasted Grosbeaks, and a host of warblers at Prince Edward Point in the Spring? It is up to us to make sure that there are!

M.J.B. Evans
Editor

KEN MEETING ON THE 40TH ANNIVERSARY

by Ron D. Weir

The first regular meeting of the Kingston Nature CLub, subsequently renamed the Kingston Field Naturalists, took place in 1949 Nov 24. Nine people attended. The constitution was adopted at a meeting about two weeks later, Dec. 6th, when the first executive was elected: President, Dr. George M. Stirrett; Vice-President, Mrs. Isabel Boardman; Secretary-Treasurer, Dr. R.G.S. Bidwell; Committee Members, Mrs. Ruth Lamb, Mr. W.E. Edwards, Mr. L. Thornton.

Four decades later, the regular November meeting of the KFN was celebrated as the 40th Anniversary, 1989 Nov. 16. A dinner at the Senior Staff Mess, Royal Military College, was followed by an illustrated talk given by John and Janet Foster on "Wildlife Encounters in Eastern Ontario". Their slides were superb. Some 125 members were at the dinner and 160 at the lecture.

Among the six surviving founding members of the KFN, three attended the 40th Anniversary Meeting - Art Bell, Isabel Boardman and Robert Stewart. The KFN President, Diane Lawrence, presented each with an engraved plaque as a Founding Member. The three unable to attend were John Cartwright (London, Ontario), Art Hyde (Kingston, Ontario), and Tony Bidwell (Wallace, Nova Scotia).

Diane Lawrence reviewed briefly KFN contributions to conservation and natural history. KFN memberships stand at 300, involving about 500 people, a number that has remained steady for several years.

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BIRD MIGRATION AT PRINCE EDWARD POINT, SPRING 1989

by Charles M. Francis
Biology Department, Queen's University, Kingston, Ontario K7L 3N6

For the second year in a row (after a long gap since the intensive banding between 1976 and 1981), we monitored the spring bird migration through Prince Edward Point on a daily basis using mist nets. Starting on 30 April, and continuing until 3 June, we set between 27 and 29 nets nearly every day at the Point Traverse woods. Most days we opened the nets at about 06:00, and kept them open until early afternoon, when the number of birds petered out. On 2 days (11 May and 2 June) persistent rain kept us from opening the nets at all, and on several other days nets were

opened late or closed early because of rain. However, even if we could have kept nets open on those rainy days, the banding totals probably would not have been much higher, because few birds were around on most of those days. In addition to the main netting at Traverse, we also caught a number of birds at the Fritze Cottage using a clap net, potter traps, or a few mist nets. Altogether, 6062 birds of 106 species were banded, of which 5837 were mist-netted at Point Traverse. An additional 81 were caught that had been banded in previous years or other locations.

There were several objectives to the banding. One of the objectives was educational. From the evening of May 7 until May 13, 3 people from a Canadian Nature Tour, organized by the Federation of Ontario Naturalists, came to help with the banding and to learn about bird identification and migration. The following two weeks, a university field course led by Dr. Fred Cooke from Queen's and Dr. Erica Nol from Trent University came to study bird migration. Ten students participated in the course, from Carleton, Queen's, Trent, Toronto and Western. The students all learned a great deal about bird identification, morphology, habitat selection, and migration timing, and each prepared a short research project which will provide them credit towards their university degrees.

A second objective was related to conservation. The daily banding totals for each species can be compared with the numbers of each species caught in previous years. Provided that appropriate cautions are taken regarding biases in the method of data collection, these can provide information on fluctuations in population size for each species, and may help give warning of environmental factors that are leading to declines in any populations.

Finally, data were collected to help answer several scientific questions about the timing and pattern of migration in different species. Many different studies will be possible from these data, but three studies were particularly emphasized this spring. For one study, I took detailed measurements on all of the warblers to examine the relationship between body size and migration dates. In a second study, I examined the colour patterns of second-year male Rose-breasted Grosbeaks to determine whether birds with brighter plumage arrived earlier in spring. In a third study, Dr. Allen Keast, from Queen's University, took measurements of wing shape for many species to study the relationships between morphology and migratory distance.

Most of the more detailed analyses of these data are still in progress, but in this report I shall present a general description of the overall pattern of migration in 1989, and compare it with 1988. I shall then describe the species composition of the birds caught, and discuss recaptures of older

birds. Finally, I shall illustrate how these data can be used to examine migration patterns in greater detail using the thrushes as a simple example.

Overall Migration Pattern

Synopsis. There was considerably greater variation in the daily banding totals this year than in 1988, as shown in Figure 1 (Day 0 = April 30). Totals of new birds fluctuated from less than 10 to over 500, with only a few days separating the busiest from the quietest day. In 1988, in contrast, totals were generally lower, but there were few days under 50, and most days totals were between 100 and 200. The difference between the years was due largely to the weather, which varied from ideal to terrible this year. In 1988 generally cool weather delayed migration until the 8th of May (the start of last year's field course!), when warm weather brought an influx of new migrants which continued fairly steadily for most of the month. There were also some differences between 1988 and 1989 in the number of nets used. On quiet days in 1988, additional nets were opened at Cedar Woods, and on some of the busier days around 22-24 May, I had little help and had to close some nets--on 23 May, I used only 10 nets, and still caught 241 birds. Also, on 17 May, which would have been a busy day, we had to close the nets before 09:00 because of a field trip (and still caught 157 birds). In contrast, we opened approximately the same number of nets every day in 1989, and only closed nets for heavy rain, when there were generally very few birds around anyway.

Detailed description. The 1989 season started with a bang as the first day of netting coincided with the arrival of a very large number of kinglets, juncos and white-throated sparrows (almost no birds were present in the area the day before when we were setting up the nets). For the first two days totals approached 400 birds per day, with very few recaptures on the second day, indicating a new influx of birds that day. In contrast, the third day we didn't open the nets until 09:30 because of rain, and caught only 10 birds over the next 4 hours, indicating that most of the birds had left the area.

Over the following 5 days there was a slow but steady trickle of new migrants. The totals fluctuated between 80 and 150, although these were inflated on some days by a large flock of blackbirds that was hanging around the nets (and did not seem to be migrating through). On the 6th, 59 out of 153 (39%), and on the 7th, 55 out of 101 (55%) of the birds, were Red-winged Blackbirds, most of which were females.

From the 8th through the 12th, numbers declined steadily, as contrary winds continued to blow (fluctuating between north-east and north-west), and the weather remained cool with intermittent

drizzle or rain. On 11 May, the rain was sufficiently heavy (and there were so few birds around anyway) that we didn't even open the nets. Unfortunately, this weather pattern coincided with most of the visit of the people from the Canadian Nature Tour, and we only caught 236 birds during the first 5 days they were there. There was, however, a fairly good variety (46 species), and the slow pace allowed plenty of time to study and appreciate the birds, making the week fairly relaxing.

The final day of the tour, in contrast, was anything but relaxing, and was a portent of things to come. The weather finally improved, and the birds started pouring in. That day, the 13th, we banded nearly 400 birds of 43 species, including 10 species that we had not caught earlier in the week.

The following day was the first day of field work for the university field course, and we opened with 300 birds of 40 species, which may have seemed overwhelming to some; however, it was just a warmup for the following day, when we banded nearly 600 individuals--even though we closed 6 nets early. The third day, in contrast, with only 143 birds, seemed positively quiet, although it would have been a quite respectable total in 1988. The next few days were progressively busier, peaking with 510 on the 19th, then dropping 2 days later to 188.

On the 22nd, numbers rose again to 319, coinciding with the day visit of a large number of visitors from the naturalists' workshop at Opinicon, organized by Queen's University. The banding table was somewhat chaotic that day, owing to the large number of people milling around, but everybody certainly got to see a lot of birds--even if there wasn't much time to study each one!

That was the last really busy day, and numbers tended to drop towards the end of that week, although there was another peak on the 27th, the final day of the field course, with nearly 200 birds (the previous day might also have been fairly busy, but periodic heavy rain forced closing of the nets quite early). The final day brought the total number of birds banded during the 14 days of the field course to 3756 (including birds from the Fritze House), with representatives of 98 different species.

The period after the course was much quieter. The Traverse nets were open for another 6 days, but even including birds caught at the Fritze House, we only banded another 405 birds. The last few birds banded around the Fritze House in early June included a number of nestlings and just fledged young of early nesting species.

Throughout the busiest period, until pretty well the end of the course, we recaptured very few birds, indicating that most birds

were just passing through, with new ones arriving everyday. However, by the end of the month we were catching many of the birds several times. This suggests that the proportion of summer residents was much higher, although we continued to catch small numbers of late migrants even on the final day.

Species Composition

Overall, we banded a total of 106 species, excluding Ruby-throated Hummingbirds, of which we caught and measured 46 (but didn't band because they were too small), and a Ruffed Grouse which we caught several times but couldn't band (because it is under provincial instead of federal jurisdiction!). Also excluded are the Brewster's Warbler, which is actually a hybrid between the Golden-winged and Blue-winged warblers, the Gambel's White-crowned Sparrow, which is a distinctive western race of this species that nests around Hudson Bay, and 2 flickers that appeared to be hybrids with the western race ("Red-shafted Flicker"), with a mixture of orange and yellow flight feathers and tail feathers. We have also counted only one species of "Traill's Flycatcher", which is actually a composite of 2 species, the Willow and Alder. Both species were heard singing near the nets, and we presumably caught both, but it is not presently known how to distinguish them if they don't sing (which they rarely do when they are being banded!).

The numbers and average capture dates of each species are listed in Table 1, together with the corresponding figures from 1988 for comparison. In general, the totals for many species are remarkably similar when comparing the 2 years, and the number of species caught each year was very similar. By far the most abundant species in 1989 was the Myrtle Warbler, with 790 individuals--more than twice as many as the next most common species, the Yellow Warbler. The numbers of the latter species were very similar to those in 1988, when it actually outnumbered the Myrtle Warbler. Both Ruby-crowned and Golden-crowned kinglets and Slate-colored Juncos were way up on last year, due largely to the big influx on the first 2 days of banding--last year it is likely that many of these birds migrated through in April before we started banding. Rose-breasted Grosbeaks were up in numbers this year (to the detriment of many fingers, but the benefit of the grosbeak study!), and there were increases in some of the warblers such as Nashville, Magnolia and Black-throated Green. It is difficult to tell whether these increases reflect real population changes, or merely the greater number of birds banded in 1989.

Blue jays largely avoided the nets this year, with a big drop in numbers from last year, but this was balanced by a large increase in blackbirds early in the month. A few Rusty Blackbirds were seen around the nets last year, but none managed to get caught--

in contrast, we caught 27 this year.

Among the more unusual species caught in 1989 were 2 Clay-colored Sparrows, 1 Prairie Warbler, 1 Cerulean Warbler, 1 Carolina Wren, and 3 Yellow-breasted Chats. The last is a very high total for this essentially southern species. We also caught 3 Orchard Orioles, matching the total for last year. Somewhat surprisingly, we didn't catch any Hooded Warblers, which is a southern species that seemed to be increasing based on a catch of 4 last year (however, one was seen near the Cedarwoods area this year by Ken Edwards). The absence of Kentucky and Worm-eating Warblers was rather less surprising, as these are both very uncommon migrants. Among other species caught last year, but missed this year, were the White-breasted Nuthatch, which we saw in the woods, but never caught, Vesper and Grasshopper Sparrows, which live mainly in the fields and only occasionally enter the netting areas, and the Pine Siskin, which fluctuates considerably in numbers from year to year, depending upon the cone crop in the conifer forests to the north. This year there was apparently a very good cone crop, and very few siskins (or redpolls) migrated this far south. Last year we kept the nets open most nights, which explains the Whip-poor-will, Nighthawk, and Saw-whet Owls. We were also lucky on the raptors, with 1 each of Cooper's Hawk, Red-tailed Hawk and Kestrel in addition to the more regular Sharp-shinned Hawks. This year we failed to catch any Red-headed Woodpeckers, although one was seen to bounce out of a net, and we compensated to some degree with a Yellow-bellied Sapsucker. We also caught fewer Red-bellied Woodpeckers this year. This is a southern species that appears to fluctuate considerably in the numbers reaching Ontario every year.

Other additions to the list this year include a Mourning Dove, which finally located the potter traps at the Fritze House on 3 June, and a Green-backed Heron that made the mistake of flying through the woods (it flew back into the net two more times before realising fields were safer). Yellow-throated Vireos, Northern Parula, and Orange-crowned Warblers are all uncommon but regular migrants that found the nets this year, but not last. We saw a Mockingbird last year, though we failed to catch it. House Sparrows are, of course, regular around the Fritze House, although we didn't catch any last year. The House Finch, on the other hand, appears to be a new immigrant. We didn't see any of these at the point last year, but this year there were several males singing around the harbour in late May, and we caught 2 females with brood patches at the Fritze House as well as 2 birds at Traverse. This species has spread rapidly through southern Ontario in the past 5-10 years, and seems to be now reaching areas further away from the towns.

Recoveries and Returns

Bird-banding is a particularly useful way to study the movements of birds, as well as their longevity and survival.

Movement studies rely on recoveries of birds away from the banding site. Unfortunately, at least for non-hunted species in North America, the recovery rates are very low. Although we caught over 6,000 birds, only 3 of them had been banded elsewhere. (Last year, we didn't catch any recoveries, and in 1985 we caught 1, a Grey Catbird banded in Ottawa the previous autumn on its southward migration.) Clearly, at such a rate, no single field project is liable to gain sufficient data for a detailed study of the movements of any one species. Nevertheless, with all of the data combined from all of the banders in North America, quite a bit of information has been gained about movement patterns.

Of the three birds we captured with foreign bands, one was a Brown-headed Cowbird that had been banded as an adult male on 17 July 1987, near Huron, Ohio, and which we caught on 31 May 1989 in a Potter trap at the Fritze House. It is difficult to tell whether this bird switched breeding areas, or whether it was a post-breeding wanderer when it was originally banded in July 1987. The second recapture was a Cedar Waxwing, that was banded at Powdermill Nature Reserve, near Pittsburgh, Pennsylvania as a second-year bird on 25 August 1988. We caught it on 27 May 1989 in the mist nets at Traverse. Cedar Waxwings are semi-nomadic, rarely breeding in the same area 2 years in a row, so it is possible that this bird bred near Powdermill last year, and moved to Ontario to breed this year although, of course, we don't know for sure where it bred either year. The final recapture was a Yellow Warbler. It was banded as an after-hatching year male on 13 May 1985 near Addison, Vermont, and recovered almost exactly 4 years later on 17 May 1989. This represents a shift of about 280 km to the west, and suggests that the bird was migrating a different route. Of course, it is not possible to tell whether it migrated a slightly different route every year, whether one or the other location was accidentally reached, due for example to bad weather, or whether it made a permanent shift in migration routes sometime in its life.

Given the very low recovery rates away from the banding site, returns of birds to the original site are usually the most useful means of studying survival rates. Birds on their breeding grounds are particularly likely to return to the same area each year, increasing the chances of catching them. We caught 78 birds of 15 species that had been banded at Prince Edward Point in previous years (Table 2). The most commonly caught species was the Brown-headed Cowbird (many of which were caught at the Fritze House), followed by Yellow Warblers, Gray Catbirds and

Song Sparrows. The highest return rate, however, was by the Rough-winged Swallow--we only banded 13 of these last year, 5 of which we caught back this year. The oldest known bird was a Kingbird, banded as a hatching-year bird in August 1979. This was one of three old birds we caught in 1988. The others were another Kingbird, also banded in 1979, and a Brown Thrasher, banded in 1980--either they didn't survive another year, or they managed to avoid the nets this year. Although these returns are informative, we do not yet have sufficient data to estimate survival rates. At least 2 consecutive years of recaptures are required to distinguish survival rates from recapture rates--many old banded birds may still be alive, but we just didn't catch them this year. In addition, we still have fairly small samples for most species.

Thrush Migration - A Sample Analysis

To show how banding data can potentially be used to study migration patterns, I have illustrated in Figure 2 the daily banding totals for the five species of spotted thrushes that migrate through Prince Edward Point in spring. As is apparent in the figures, the general pattern, and the average timing, remains very consistent from year to year--in fact the order of the average capture dates was exactly the same in both years (the means are given in Table 1). Consistent trends such as these suggest that the banding data provide a reasonably good measure of the true arrival times of each species.

To see whether the arrival times of each species correspond with their migratory distances, I looked up their wintering and breeding ranges in the American Ornithologist's Union checklist. The Hermit Thrush, which arrives earliest, winters the furthest north, in the southern United States. The Wood Thrush which is next, winters in Central America. The other three species winter mainly in South America, and are the latest to arrive, although there appears to be little difference between them in latitude. However, differences in breeding latitude seem to explain the remaining variance. Excluding the Hermit Thrush, which breeds at an intermediate latitude, the capture order matches the breeding latitude perfectly. The Wood Thrush is most southerly, followed by the Veery, the Swainson's Thrush, and finally the Grey-cheeked Thrush, which breeds mainly in the far north (at least the subspecies that we catch). Of course, from an analysis such as this, it is not possible to differentiate cause and effect--whether they winter further north so they can migrate early or vice versa.

Differences between years can also give some clues about the effects of weather. Hermit thrushes appeared to be somewhat earlier this year than last, although this must be interpreted cautiously, as many of them may have migrated through in April

last year. Wood Thrushes were slightly later in 1989, presumably because many of them were held back by the bad weather in early May. The Veery and Swainson's Thrush did not differ much between years, presumably because they were migrating mainly during favourable weather in both years. Gray-cheeked Thrushes were slightly earlier this year than last, but the difference is slight, and very few birds were caught anyway, so it probably is not very significant. The relatively low numbers of Gray-cheeked Thrushes potentially suggests that they are less common than the other species. However, it is possible that birds migrating late, when the weather is generally favourable, may be much more likely to migrate straight through without stopping, and therefore they are under-represented in the banding sample.

Clearly, there are many potential biases in banding data, but if the data are interpreted cautiously--and supplemented with additional data when possible--they can provide valuable information on such things as the timing of migration, or changes in relative population size.

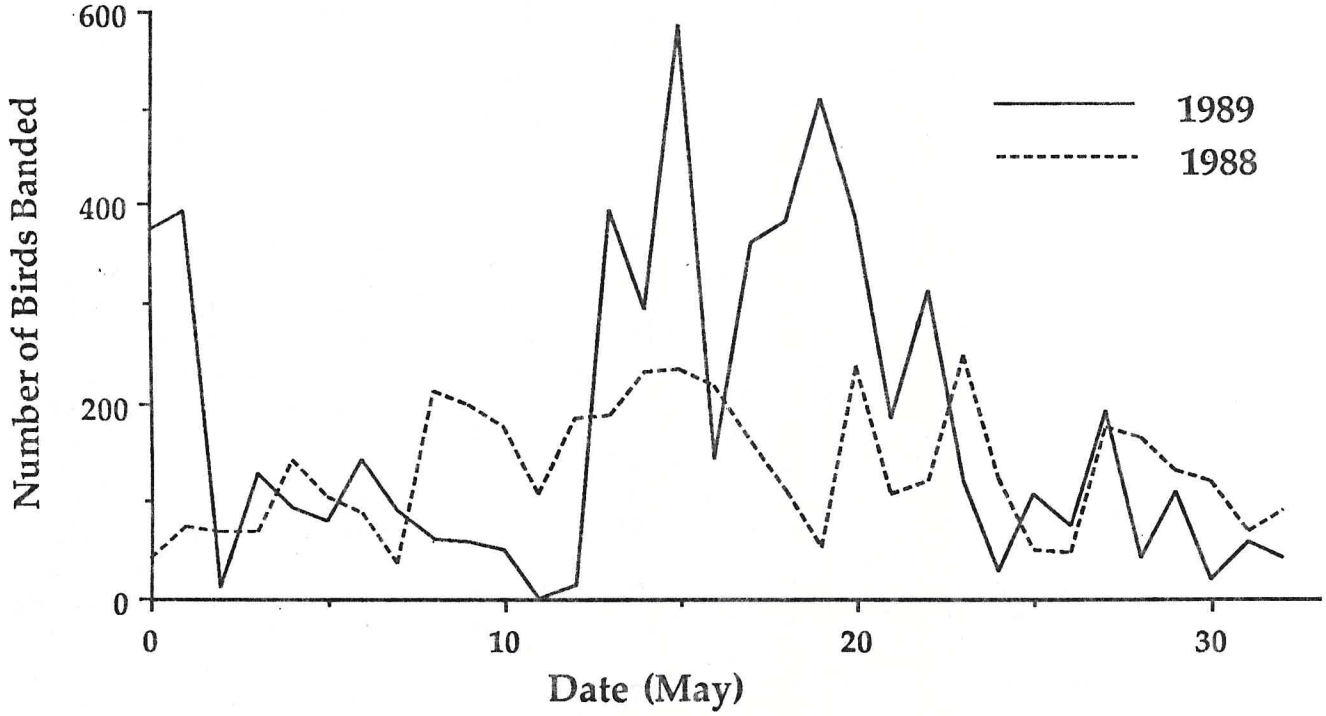

Figure 1. Daily banding totals at Prince Edward Point, Ontario, for Spring 1988 and Spring 1989. The data include only birds caught in mist nets. Birds were netted only in the Point Traverse woods in 1989, but were netted at both Point Traverse and the Cedarwoods are in 1988.

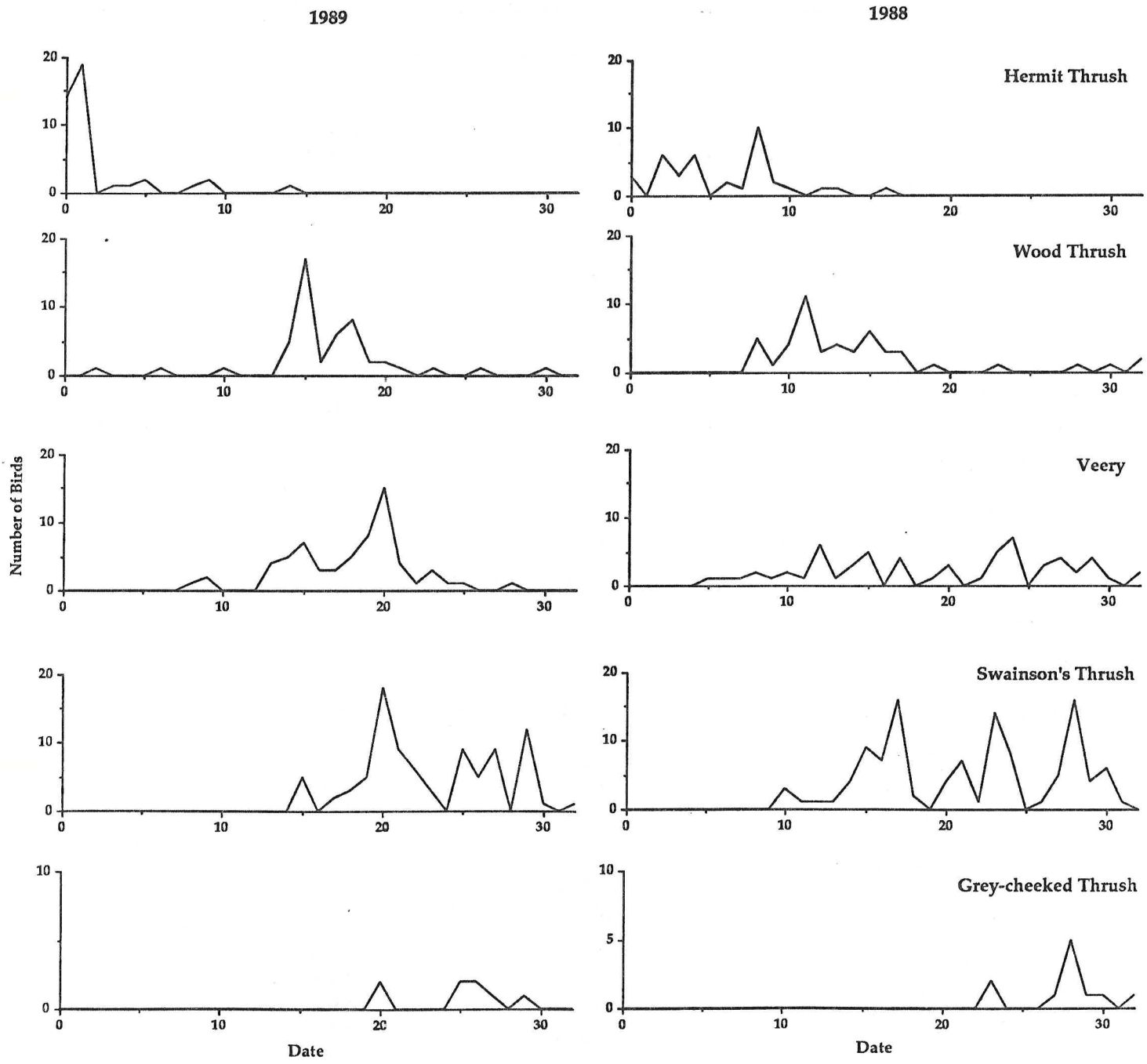

Figure 2. Daily banding totals for five thrush species at Prince Edward Point, Ontario during spring 1989, and spring 1988.

Table 1. Total numbers and average capture dates of each species banded in the spring of 1989 and 1988 at Prince Edward Point, Ontario. Most of the birds were caught in mist nets at the Traverse Woods, but these totals also include those banded at Cedar Woods (1988 only) as well as birds trapped or clap-netted at the Fritze House and a few birds banded as nestlings. The dates are all in May, except that 0 = April 30, and 32 = June 1, etc.

Species	1989 Total	1989 Mean Date	1988 Total	1988 Mean Date
Green-backed Heron	1	21.0	.	.
American Woodcock	1	28.0	1	12.0
Common Snipe	1	21.0	1	25.0
Solitary Sandpiper	.	.	1	16.0
Killdeer	4	40.0	4	14.0
Mourning Dove	1	34.0	.	.
Sharp-shinned Hawk	7	8.6	10	10.2
Cooper's Hawk	.	.	1	7.0
Red-tailed Hawk	.	.	1	11.0
American Kestrel	.	.	1	12.0
Northern Saw-whet Owl	.	.	4	4.0
Black-billed Cuckoo	3	28.3	3	31.3
Hairy Woodpecker	2	15.5	1	14.0
Downy Woodpecker	9	13.9	12	12.3
Yellow-bellied Sapsucker	1	15.0	.	.
Red-headed Woodpecker	.	.	1	13.0
Red-bellied Woodpecker	1	27.0	6	12.0
Yellow-shafted Flicker	25	7.5	16	5.8
(Yell. x Red Flicker	2	0.5	2	2.5)
Whip-poor-will	.	.	1	12.0
Common Nighthawk	.	.	1	17.0
Eastern Kingbird	34	17.9	40	25.9
Great Crested Flycatcher	21	19.2	21	21.4
Eastern Phoebe	6	14.5	3	5.3
Eastern Wood Pewee	38	26.7	55	26.6
Yellow-bellied Flycatcher	29	27.0	27	27.9
Traill's Flycatcher	41	28.3	49	28.2
Least Flycatcher	110	19.8	102	18.2
Blue Jay	24	19.5	137	18.4
European Starling	7	21.6	10	19.4
Bobolink	8	21.9	14	19.8
Brown-headed Cowbird	87	17.9	61	15.6
Red-winged Blackbird	234	8.7	89	15.4
Eastern Meadowlark	3	18.0	1	15.0
Orchard Oriole	3	13.3	3	16.0
Baltimore Oriole	160	18.3	166	16.4
Rusty Blackbird	27	1.6	.	.
Common Grackle	58	20.6	38	14.6
Purple Finch	18	5.8	3	12.3
House Finch	6	28.7	.	.
American Goldfinch	107	21.7	126	19.0
Pine Siskin	.	.	39	14.7
Vesper Sparrow	.	.	1	17.0

Table 1. continued

Species	1989 Total	Mean Date	1988 Total	Mean Date
Savannah Sparrow	16	16.1	13	14.1
Grasshopper Sparrow	.	.	3	10.3
White-crowned Sparrow	57	16.5	26	15.2
(Gambel's W-c Sparrow	1	8.0	.	.)
White-throated Sparrow	292	9.3	216	7.4
Chipping Sparrow	147	13.7	122	12.6
Clay-colored Sparrow	2	15.5	.	.
Field Sparrow	31	11.5	44	10.7
Slate-colored Junco	179	1.3	41	2.4
Song Sparrow	45	12.3	65	12.7
Lincoln's Sparrow	54	18.4	50	15.8
Swamp Sparrow	43	11.8	35	11.5
Rufous-sided Towhee	4	8.0	7	10.4
Northern Cardinal	1	19.0	1	10.0
Rose-breasted Grosbeak	216	17.5	129	16.6
Indigo Bunting	32	27.8	26	24.8
Scarlet Tanager	32	20.1	25	17.8
Cliff Swallow	1	24.0	1	19.0
Barn Swallow	6	16.2	8	18.5
Tree Swallow	7	21.6	11	16.4
Northern Rough-winged Swallow	11	20.0	20	17.8
Cedar Waxwing	80	27.4	37	26.9
Red-eyed Vireo	118	24.9	117	26.3
Philadelphia Vireo	11	23.7	9	21.1
Warbling Vireo	17	20.9	13	14.8
Yellow-throated Vireo	3	17.3	.	.
Solitary Vireo	16	13.3	9	11.3
Black-and-White Warbler	84	16.7	33	14.5
Worm-eating Warbler	.	.	1	27.0
Blue-winged Warbler	4	17.3	4	18.8
(Brewster's Warbler	1	13.0	1	21.0)
Golden-winged Warbler	9	17.7	7	15.4
Nashville Warbler	192	16.3	63	13.4
Orange-crowned Warbler	2	20.0	.	.
Tennessee Warbler	36	20.7	37	20.9
Northern Parula	2	16.5	.	.
Cape May Warbler	19	20.6	17	17.4
Yellow Warbler	380	18.9	349	19.2
Black-throated Blue Warbler	36	17.1	41	19.4
Myrtle Warbler	790	12.2	347	8.1
Magnolia Warbler	256	20.6	186	22.0
Cerulean Warbler	1	17.0	.	.
Chestnut-sided Warbler	72	21.1	74	20.5
Bay-breasted Warbler	38	22.3	37	19.4
Blackpoll Warbler	7	26.9	18	28.8
Blackburnian Warbler	56	20.8	44	23.2
Black-throated Green Warbler	101	19.8	43	18.3

Table 1. continued

Species	1989 Total	1989 Mean Date	1988 Total	1988 Mean Date
Pine Warbler	3	12.3	2	6.0
Western Palm Warbler	16	15.1	6	9.2
Prairie Warbler	1	19.0	.	.
Ovenbird	47	20.0	50	21.2
Northern Waterthrush	9	17.9	6	18.7
Kentucky Warbler	.	.	1	14.0
Mourning Warbler	16	26.6	27	26.1
Common Yellowthroat	128	19.3	117	19.8
Yellow-breasted Chat	3	23.0	.	.
Hooded Warbler	.	.	4	28.0
Wilson's Warbler	22	22.5	24	21.4
Canada Warbler	33	23.5	31	24.2
American Redstart	58	22.0	85	21.5
House Sparrow	3	22.7	.	.
Northern Mockingbird	1	20.0	.	.
Gray Catbird	181	20.4	145	20.8
Brown Thrasher	14	15.3	24	11.7
Carolina Wren	1	0.0	.	.
House Wren	15	14.6	51	13.5
Winter Wren	6	2.8	7	5.1
Brown Creeper	83	2.9	23	3.9
White-breasted Nuthatch	.	.	3	15.3
Red-breasted Nuthatch	2	20.0	3	16.7
Black-capped Chickadee	19	15.7	20	6.0
Gold-crowned Kinglet	194	1.7	12	2.9
Ruby-crowned Kinglet	312	7.9	149	8.8
Blue-gray Gnatcatcher	3	9.7	1	13.0
Wood Thrush	49	16.3	49	14.1
Veery	64	17.9	61	19.3
Gray-cheeked Thrush	8	24.8	11	27.6
Swainson's Thrush	88	22.9	111	21.4
Hermit Thrush	45	3.0	37	5.8
American Robin	50	18.8	85	12.9
Eastern Bluebird	1	32.0	.	.

Table 2. Numbers of birds recaptured in 1989 that were banded in previous years at Prince Edward Point.

Species	Year of Banding			
	1988	1986	1985[a]	1979
Downy Woodpecker	2			
Eastern Kingbird	1		1	1
Great-crested Flycatcher	1			
Eastern Wood Pewee	1			
Brown-headed Cowbird	13			
Red-winged Blackbird	5			
Baltimore Oriole	4			
Common Grackle	3			
American Goldfinch	1			
Song Sparrow	8		1	
Rough-winged Swallow	5			
Yellow Warbler	10			
Grey Catbird	10			
Black-capped Chickadee	2[b]	1[c]		
American Robin	7		1	

[a] In 1985, we banded birds for only part of the spring (as part of a field course). The total was only about 2,000 birds.

[b] These 2 chickadees were caught together on 12 November 1988, when I left the owl nets open for a few hours in the morning.

[c] This chickadee was caught in an owl net in October 1986 (there wasn't any spring banding that year).

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NATURE RESERVES OF THE KFN

by
Helen R. Quilliam and Ron D. Weir

One of the objectives of the KFN, described in Article 11 of its constitution, is to acquire, receive, and hold lands for the purpose of preserving their natural flora and fauna. The following article describes the history of acquisition of the Nature Reserves held by the KFN, how the KFN administers the holdings and pays the taxes.

The first purchase occurred in 1963 when 80 hectares (200 acres) in the Otter Lake - Sucker Lake area north of Sydenham were acquired. As part of the process of searching, Martin Edwards and Helen Quilliam had visited the office of the Dept. of Lands and Forests (now M.N.R.) at Tweed to inquire about the availability of Crown Land. They were shown a map of lands still under the Crown, but were told that even though the property sought by the KFN would be for preservation and nature study only, it would be considered a private use and that the Department's policy of the day prohibited giving up any more Crown land for private use. The 1963 purchase had followed many exploratory expeditions into the country north of Sydenham and this particular spot was first discovered on foot. At that time the road between the two lakes was closed because of flooding by beavers. A walk to the low area where flooding had almost joined the two bodies of water revealed a beautiful spot. A Common Loon floated by and called just offshore. The KFN explorers had found the right place.

A quick trip to the Registry Office of Loughborough Township revealed that the property was owned by Gananoque Power & Light Co. They agreed to sell their two lots, with the caveats that if the KFN ever wished to dispose of the property it must first be offered to the Company, and that the KFN could not object to the construction of a dam if this were ever deemed necessary by the Company. Because of these conditions, a very low selling price was asked, which the KFN was able to afford at that time. Named the Otter Lake Sanctuary, this property lies on the Canadian Shield and contains a mixed mature hardwood - coniferous forest, marsh, swamp, bogs, lakes and rocky outcroppings.

Sand from a small pit in the Sanctuary along the public road was sold to the Township for road work in the area and the revenues were used to finance an expansion in 1967 of 40 hectares immediately adjacent to the initial purchase. An additional expansion extending to Gould Lake occurred in 1981 when 80 hectares were acquired, financed by donations from the membership and from monies raised in various projects (Wright 1981).

Our Sanctuary lands are strategically located between holdings by the Cataraqui Region Conservation Authority to the southwest on Gould Lake and Frontenac Provincial Park to the east. Various studies in North America have shown that continuous tracts of land are required by many bird species to survive and reproduce. Isolated islands of habitat fail to meet their needs. Thus the preservation of the Otter Lake Sanctuary will serve many bird and other animal species well. Because of its mature hardwoods and long term security with the KFN, the Sanctuary was chosen in 1987 as one of the sites in Canada where the annual Forest Bird Monitoring Studies began in 1988 in an effort to measure the effects of destruction of tropical rain forest on insect eating birds of Canadian forests. Aside from some walking trails in addition to the Rideau Trail and labels placed adjacent to some typical plants, the Otter Lake Sanctuary is maintained in its natural state.

The acquisition of the Sanctuary spurred considerable activity and served as a focus binding the KFN membership together. It is a place members can enter at any time and study at leisure. Trails were marked out. Organized and unorganized field trips, particularly by the botanists and lepidopterists, led to considerable exploration and discovery. Dr. Roland Beschel put down markers for many flowering plants. Several unusual species of orchids were found thanks to the efforts of Nora Mansfield and Leslie Roberts. The ferns were identified. Nesting Osprey, Barred Owls, Golden-winged and Cerulean Warblers are annual within the Sanctuary. The KFN Junior Naturalists put up boxes for nesting Wood Ducks. Various studies and censuses have been carried out in the Sanctuary. Among those published are on the Orchids (Roberts 1973), bird species (Little 1979), vascular plants (Roberts 1980), butterflies and skippers (Pratt 1982).

Following our lengthy search for suitable marsh property along Lake Ontario, the KFN, with financial assistance from Wildlife Habitat Canada, purchased 100 hectares on Amherst Island. This property is an outstanding birding area, consisting of grassy fields, cattail and sedge marshes, and a gravel bar reaching out into Lake Ontario. This area is one of our best observation points for the spring and fall migration of waders, terns, gulls, and waterfowl. It hosts the largest known breeding colony of Wilson's Phalaropes east of Rainy River, Ontario. The KFN's share of the purchase price was raised from membership donations and accumulation from various projects.

In 1987, the KFN and Ducks Unlimited (DU) signed a conservation agreement by which the marshes on the property, which invariably dried up each July, would be upgraded. An earthwork dam was completed in 1988 with a weir to control water levels and to permit a complete drawdown about once in a seven year period. Ducks Unlimited bore the costs associated with the construction and will maintain the earthworks for 30 years at their expense.

In return, the KFN has agreed to leave the earthworks in place for that period. The pond resulting from the dam covers 12.5 hectares when water is at the normal operating level.

In the first nesting season following completion of the earthworks, nesting waterfowl numbers rose compared with the previous 10 years as the ducks took advantage of the wetland. Among the species raising broods on the property in 1989 were Canada Goose, Green-winged Teal, Black Duck, Mallard, N.Pintail, Blue-winged Teal, Shoveler, Gadwall and American Wigeon. Five of the six shorebird species known to nest in the Kingston region did so on the property in 1989, viz. Killdeer, Spotted and Upland Sandpipers, Common Snipe and Wilson's Phalarope. Numbers of nesting Black Terns rose as the birds exploited both the cattail and grass marshes. Two apartment houses erected for Purple Martins were occupied and several broods were fledged.

The philosophies of management of the Sanctuary lands and the Amhest Island holding are very different. In general, the Sanctuary is left in its natural state with almost no interference. A few walking trails are maintained there and signs are posted to prevent users from getting lost and to deter hunters. However, for the Amherst Island property, the marshes have been upgraded and this traditional agricultural area has been kept in that use by permitting cattle grazing, which serves two important functions. Firstly, grassland is maintained to benefit the waterfowl and migrant shorebirds. Secondly, the income derived offsets taxes on the property. The maintenance of the cattle fences is the responsibility of the grazer so that KFN maintenance is minimal on this property as well.

In 1987, the KFN Executive set up a Capital Reserve Fund as By-Law 9 in which are maintained sufficient investments to generate the necessary interest income to pay the annual taxes on KFN lands. This By-Law was put in place so as not to place any financial burden on the future membership and to permit any additional land acquisition to be free of taxation concerns. The Nature Reserves Standing Committee manages all the KFN property in accordance with the policy outlined in the Appendix to the By-Laws, which are reprinted here. Currently, the Government of Ontario rebates part of the taxes on land maintained as forest, for which the Otter Lake Sanctuary qualifies, and on land used for agriculture, for which our Amherst Island property qualifies. These rebate programmes relieve some of the tax burden but history shows that they are transitory at best.

Appendix to By-Laws - Nature Reserves

(i) Use of Nature Reserves is restricted to Members of the Kingston Field Naturalists and their guests. Members wishing to sponsor a group visit, or a visit by an outside organization, should first seek permission from the Committee or KFN Executive.

(ii) KFN Members using the Nature Reserves should ensure that they do not jeopardize the natural state, or designated management activities of the area (see Appendix subsections A and B). Hunting, trapping, recreational vehicles and open fires are prohibited. Camping is not allowed except by special permission from the Committee or KFN Executive.

(iii) User of KFN Nature Reserves do so at their own risk.

(iv) Projects on natural history are encouraged on the Reserves. To ensure that projects are compatible with the natural environment and other possible activities taking place there, all projects should receive prior approval from the Committee. Records should be kept for all projects to ensure the preservation of results for later use. Field notes and records should be placed on file with the KFN Executive.

(v) Collection of specimens is forbidden except with specific permission from the Committee, where a project will be of particular scientific value.

SUBSECTION A

OTTER LAKE SANCTUARY

(1) Otter Lake Sanctuary is to be maintained in its natural state. Permanent buildings are undesirable. If in the future any small permanent building for shelter becomes necessary, it must be designed and built to merge with the surroundings with as little disturbance as possible.

SUBSECTION B

AMHERST ISLAND RESERVE

(1) The Conservation Agreement with Ducks Unlimited will remain in force until its expiration in the year 2016.

(2) The Amherst Island Reserve is to be maintained in a state of grassland.

What of the future? It is certain that the Kingston area will grow significantly in population over the next 100 years. Development pressure will accompany this growth with strong lobbies to fill wetlands, including conservation authority lands, for housing, industrial use, dumps, or recreation. A number of the significant natural areas within 50 km of Kingston have been identified by the KFN. Some of these are probably secure for the next 100 years, but many are not. Where the KFN can act as a catalyst to ensure saving these areas, it will probably do so, and that catalytic activity may sometimes involve buying the land but other times arranging for some other route for preservation.

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THE EMIGRANT FACTOR
A BIOLOGIST'S DEFENCE OF A GLOBAL PERSPECTIVE

by Adrian Forsyth

(An abridged excerpt from "The Nature of Birds", by Adrian Forsyth, published by Camden House Publishing, 1988. Reproduced by permission of the author and publisher.*)

My eyes downcast, I am fully occupied with my bit of the earth, watching the fork tines open the soil, exposing the potatoes like huge, pale eggs nested in the earth or stooping to waggle the carrots by their tops and to lift the bright orange tapers out of the dark and into the light. And then I hear the honking and calling in the north: above the trees, the first Canada geese are southbound. Their cries, the sound of their swishing wings and the sight of their long necks stretched in one collective direction express an urgency - as though they are chasing a fading sun that is receding from the Earth.

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* Available from Harrowsmith Bookstore, Camden East, Ont., KOK 1JO (1-800-267-0954) Soft cover edition (#1007A) $19.95; Hard cover edition (#1007B) $29.95 .

That is all repeated in the spring. Outside our house last April, I bent to pick up a Tennessee warbler, a bit of bright fluff with almost no mass to it - just enough to have broken its neck on one of our windows. The tiny warbler had spent 150 nights in a towering tropical forest, where rains come in torrents, where kinkajous and opossums prowl the treetops, where pit vipers wait. This warbler had crossed oceans, and now it was back - and dead. The dissonance made me realize that much of the marvel which is the first spring warbler is the sense of where it has been all winter long.

These things set me thinking about the shrinking tropical forest and the poisoned marshes of Chesapeake Bay. I have been wondering more and more about the autumn clouds and the arrows of southbound birds and the future of their destinations. The birds, the ecosystems and human societies are in trouble.

Even the sedentary northern naturalist must think of the large ecological world beyond his or her own narrow sphere of activities. It is no accident that organizations seeking public donations for conservation programmes in the Tropics rely heavily on the example of migratory birds to make the issues seem relevant to North Americans. The comings and goings of migratory birds link continents and, in the process, they expand our view of the world.

Broadening our perspective is becoming more and more necessary as the world grows smaller. In the current international economy, most of our actions have global ecological significance. The chain of cause and effect associated with our lives touches every bit of the globe and influences matters large and small: the pesticides we sell to other countries come home as residues in the fish we eat; the radioactivity of a French atomic test in Polynesia shows up in our caribou; a mighty leatherback sea turtle that hatched on a beach in Suriname chokes on a plastic bag it has mistaken for a jellyfish drifting south from the Canadian Arctic.

Not only are we capable of polluting a foreign land or organism, we can now consume its wildlife in a more direct manner. The incursion of multinational agribusiness into tropical environments, the clear-cutting of trees and the devastation of the rain forest by squatters in search of fertile land have all had dire consequences. According to Oxford University's T.C. Whitmore, the globe's equatorial greenbelt is being destroyed relentlessly, at the rate of 75,000 acres per day. The cheap beef we feed our dogs and cats, more protein than that eaten by the entire populace of India, is paid for with the destruction of tropical ecosystems. As we bite into a fast-food hamburger and wash it down with a carbonated sugar solution enlivened by kola nut extract and caffeine, another swath of tropical forest is being gutted to feed our demand for cheap tropical produce. As

we eat, an ovenbird flies from one ecological wasteland to another, from pasture to plantation, seeking but not finding the trackless primeval tropical forest still imprinted in its genes as migratory maps.

Those things we do in innocence and ignorance are finally starting to come home in a tangible and unpleasant form: they are beginning to affect our migrant birds. The birds in our parks, forests and backyards, which we assume will show up as usual each spring, are in trouble. It is time for us to contemplate their winter.

An estimated five billion birds, at least 248 species in all, pour out of North America each autumn on their way to Central America and northern South America. They pack themselves into an area much smaller than the northern landmasses where they bred earlier and so, in winter, they exist at densities far greater than those of summer. Many of our northern songbirds actually spend more time in tropical forests than in northern temperate habitats. For that reason along, tropical ecology is part and parcel of the survival of our temperate songbirds. As a result, those ornithologists with tropical experience take a very different view of migration than do most northern naturalists, seeing it as an opportunity for tropical birds to increase their reproductive success in a summer location. From their point of view, these birds are migrating north for the temporary ease of a North American summer, rather than migrating south to avoid harsh, inhospitable winters.

Nevertheless, the objective scientific importance of the winter ecology of migrant birds has not been great enough to stimulate much research on the topic. Russell Greenberg of the Smithsonian Institution points out that it is only in this decade that ornithologists have actually shown territorial behaviour of migrants on their wintering grounds to be quite common. After reviewing everything published on the subject, Greenberg concludes that "the serious study of the ecology of migrant birds in tropical areas has barely begun."

It was not until 1980 that the first collection of papers on the topic of migrant ecology in the Tropics was published. Browsing through that tome, one begins to realize that we have only begun to fathom the extent of the ecological complexity of the phenomenon of migrant birds that flutter around us every day of our temperate summers. I watch the first ruby-throated hummingbird working the columbines and know that a short while ago, the tiny bird was perhaps probing the flowers of a vine sprawled across the stelae and glyphs of a ruined Mayan civilization. But why Yucatan rather than Cuba or Jamaica? Who can assure me that as Central America's ecology is gradually destroyed, the ruby-throats will have the genetic flexibility to winter elsewhere?

Ornithologists are discovering unexpected richness in the tropical natural history of temperate birds. Who would have guessed that in winter, the eastern kingbird, a bird that I see all summer hawking insects along the lakeshore, enters into a special relationship with a tropical tree? Eugene Morton of the Smithsonian Institution points out that these kingbirds, along with red-eyed vireos and scarlet tanagers, begin their winter by flying deep into Amazonian Ecuador, Peru and Bolivia. They then follow the advancing dry season north, apparently tracking the seasonal fruiting of the *Didymopanax morotonii*, a tree that is noted for relying on these birds to disperse its seeds. I will have to look with new eyes at the next crying kingbird that hovers over my trespassing canoe as it cruises by the overhanging cedars of Ontario's Lake Opinicon. It is a transmogrification of the Amazon forests.

It is an environmental disaster that so much intricate migrant ecology will be destroyed before we can begin to study it. Tropical forests cover only about 6 to 7 percent of the Earth, but they contain roughly two-thirds of all our bird species. Fifty acres of tropical forest are destroyed every minute of every hour of every day. As they disappear, many migrant bird populations must also decline.

Naturally. it is not just the birds that are in difficulty. Human poverty is increasing as habitats are degraded and the ecological productivity of the land diminishes. In the Tropics, we are witnessing the first terrifying demonstration that all species depend on the health of ecosystems. Ultimately, we all suffer when resources and species, humans included, are excessively exploited.

In proportion to their financial resources, knowledge and potential influence, North American scientists have done almost nothing about such ecological problems.

There is a curious disparity between what we know of the marvelous mechanisms of avian migration and what we know about the ecological systems in which the marvel takes place. It is amazing what scientists have discovered about bird migration and navigation. They have chartered planes during the day and the night, released birds and employed planetariums to show that birds can use the stars as compasses. They have built sophisticated instruments to discover and prove that birds can see ultraviolet light which is invisible to us, and to show that birds can hear the deep ultrasound generated by winds pouring over the Rockies, sounds to which our ears are deaf. They have measured the effects of magnetic fields. They have gathered astonishing information through dedication, work, intelligence and the use of sophisticated resources. And yet scientists as a group have made little use of their dedication, intelligence,

energy and resources to preserve the ecosystems that sustain the very life they have studied so hard to be able to describe. Amateurs, naturalists and conservationists have done far more than academic biologists to protect bird populations.

We can only assume that a limited mental geography explains the chasm. Lester Short's remarks were written a mere four years ago. How late we have left it! Too many of the best-qualified individuals have stayed in the comfort of their ivory towers, clucking indignantly but impotently at the destruction. What is required is an activism that makes use of their skills and education. The most ordinary of industrial concerns, the most conservative fundamentalist religious groups, the watchdogs of consumer goods - all have lobby groups in the nation's capitals. But hordes of professional biologists sit back and complacently imagine that underfinanced conservation groups will somehow manage to publicize the crisis. If we are to do anything constructive about the fate of migrant birds, we have to understand that environmental devastation is driven by the politicians, planners and economists who remain stolidly urban and nationalistic, rather then ecological and global, in their outlook and who remain relatively uninformed and unaffected by ecologists.

There are still North Americans who possess only the dimmest sense of international geography and of the potentially disastrous trends in global ecology that their lives determine. Yet the wealth and expertise that resides in the north can be used to build and rehabilitate the south only when the people in developed countries become more outward-looking. Ecologists in particular must use all their resources to make global ecological sustainability an integral part of our national- and foreign-policy agendas.

The restricted mental geography that our political nationalism promotes is what lends impetus to the decline of our own migrant bird populations. The threatened loss of a few of our migratory wood warblers may motivate North Americans to save tropical forests that contain vast numbers of other resident species. From pure self-interest, temperate naturalists have plenty to be concerned about.

Princeton ecologist John Terborgh, an authority on Neotropical migrant birds, summarizes the deteriorating situation confronting our temperate songbirds: "About half of all land birds breeding in North America go to Mexico, the Bahamas, Cuba and Hispaniola. Migrants commonly make up 50 percent of bird numbers in these northern areas and lesser percentages as one goes south into southern Middle America. Since many migrants are concentrated in winter, the clearing of one hectare of forest in Mexico is probably equivalent to clearing five to eight hectares in the

northeastern United States.... Continued tropical deforestation will result in major reductions in many species."

Anthony Diamond of the Canadian Wildlife Service has recently made a detailed study of the expected habitat loss for many of the North American migrants. By the year 2000, a short dozen years from now, Philadelphia vireos will have lost 83 percent of their wintering habitat; ruby-throated hummingbirds, 59 percent; Baltimore orioles, 52 percent. The litany is long and depressing.

It is true that migrants often use edge habitats or early succession areas such as the forest that springs up along shifting riverbeds in Amazonia or new landslides in mountainous regions. But it is naive to expect that birds which have evolved over thousands of years in virtually pristine tropical habitats will be able to cope effectively with the present rate of change. Terborgh argues that "the notion that second growth will provide a haven for migratory populations is, I think, largely fallacious.... Most migrants favour tree crowns or the cool dark recesses of the forest interior." In any case, second-growth forest is in short supply in Central America. In its place are huge areas of cattle pasture dominated by African grasses and pan-tropical weeds. "The total biomass of birds breeding in the North American continent will probably change little," suggests Terborgh. "What will change is the familiar ambience of our forests in springtime. It just won't sound the way it used to."

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FIELD TRIPS

1) AMHERST ISLAND - 1989 AUG 27 by Ron D. Weir

Twenty-eight participants took part in their outing to Amherst I. Bright sunshine with light NE winds shifting later to light SW provided ideal conditions for viewing the birds. The entire morning was spent exploring the KFN property at the east end. By proceeding slowly and patiently, it was possible for everyone to see most of the birds, especially those at close range through telescopes.

Among the highlights were 10 Baird's Sandpipers that allowed a close approach within 3 metres. In the same field of view were Semipalmated Sandpipers, Least Sandpipers, Sanderlings and Spotted Sandpipers, which made comparison of field marks ideal. In addition, age differences were also noted. Black-bellied Plover, Semipalmated Plover and Killdeer were also together for comparison. About 10 Short-billed Dowitchers permitted leisurely study and photographing. All of these birds were either in the pond or along the rocky bar.

Waterfowl present included geese, teal, both Green-winged and Blue-winged, Mallard, Black Duck, Shoveler, pintail, gadwall and wigeon. All these species nested on the property during this past spring and summer, which represents a sharp rise in nesting numbers over those breeding there prior to the habitat improvement by the KFN. The season's first Water Pipit flew over us at the corral as we ate lunch. For an hour after lunch, the owl wood was searched for warblers, vireos and flycatchers, but only 15 species in all from these families were seen. Tree Swallows at 3500 birds outnumbered all other species on the island.

2) WOLFE ISLAND - 1989 OCT 15 by Gustave J. Yaki

About 25 participants arrived off the 7:15 a.m. ferry from Kingston on this overcast but windless day. Early morning temperature was about 46 degrees F. (8 C.) but climbed up to about 64 degrees F. (18 C.) by mid-day as the sun came out.

The first stop was a Mill Point where an immature White-winged Crossbill, present the day before, was still in the same spruce trees. Many small passerines here included a tardy Red-eyed Vireo, Palm Warbler, Rufous-sided Towhee, and an Eastern Phoebe, the first of four seen during the day.

At the sewage pond on the 4th Line, a female Bufflehead flew off, leaving behind two female-plumaged Teal (probably Green-winged), which refused to fly in spite of encouragement. American (formerly Water) Pipits sat in a tree next to the road. Later a Merlin flashed through the trees, at one point tilting 90 degrees to manoeuvre through the twigs, in pursuit of a small woodland bird. Nearby a small flock of Black-bellied Plover were found in a freshly manured field. From the south side of Reed's Bay, A common Loon, about a dozen Horned Grebes, and some Bonaparte's Gulls were noted. Near Sand Bay, working the mud flats, were about five Pectoral Sandpiper and a similar number of Common Snipe. Several groups of Dunlin were out on the rocky shore. A Northern Mockingbird obligingly sat on a wire along Highway 96.

At noon about half the group left. The rest saw about 20 migrating Turkey Vultures enroute to Horne Point where all three species of Scoters were present, including full plumaged males. Nearby one Canada Goose in a ghostly plumage - a gray-white body with paler neck markings than its companions - was in a grassy field. At Pyke's farms, four immature and five adult Snow Geese mingled with Canadas. Later, at Reed's Bay, again, an adult blue-phase Snow Goose was observed. Several Lapland Longspurs were also encountered.

In all, a total of 76 species were noted. Interestingly, 16 species seen the day before were not recorded.

FALL ROUND-UP - 1989 NOV 4-5

by Ron D. Weir

The 24th KFN Fall Round-Up took place tween 1500 h. Saturday 4 November and 1500 h. Sunday 5 November 1989. Participants numbered 31. Weather on Saturday was clear with increasing cloud by sunset, 5 degrees C., E to SE winds (light). Sunday began with overcast conditions, south winds which became very strong to 50 kph by mid-morning and 10 degrees C. Broken cloud gave way to rain clouds by mid-afternoon and rain began by evening. The strong wind made finding songbirds difficult.

Nevertheless, the 133 species constitute a record high (previous 126 in 1980) which compare with the 1970-88 (19 year) average of 113 species. The only new species to the Count was the Solitary Sandpiper (party #5). Seen only for the 2nd time were the Cattle Egret (party #8) and Yellow Warbler (party #5). Other noteworthy sightings include the Brown Thrasher and Solitary Vireo (party #1), Tree Swallow (party #2), Brant, Ring-necked Pheasant and Long-eared Owl (party #3).

N.Goshawk, Field and Savannah Sparrows (party #4), Baird's Sandpiper (party #5), Eastern Phoebe (party #6), King Eider, Purple Sandpiper and Little Gull (party #7), and Bohemian Waxwing (parties #1 and #7).

Record high counts were tallied for Common Loon at 400 (previous high 177), Great Blue Heron 31 (17), Snow Goose 50 (17), White-winged Scoter 575 (300), and House Finch 67 (53). The Sora Rail was the first since 1976, and the White-winged Crossbills, the first since 1981. The cumulative total since the Fall Round-up began in 1966 stands at 211 species.

The makeup of the parties follows with the main spots that were visited. The numbers in the following table have had known duplications removed so that the total individuals for a species may not equal the sum of the contributions from each party. The results are a fairly accurate estimate of the numbers of birds found. After the count, birders once again enjoyed the potluck supper and warm hospitality offered by Marian and Joel Ellis.

Party 1- Josette Arrasus, Kathy Innes, Laurie Wright (Amherst I., P.E.Pt., Bell's I.).

Party 2- Bill Cutfield, Marg Hendrick, Annette Mess (Perch R., Wolfe I.).

Party 3- Art Bell, Lynn Bell, Joel Ellis, Peter Good, Betty Gray, Kurt Hennige, Paul Mackenzie (Wolfe I., Amherst I., Bell's I., local areas).

FALL ROUND-UP (cont'd)

Party 4- Fred and Sylvia Cooke, I. Craine, B. Gjetvaj, T. Jamieson, P. Krannitz (Canoe L., Wolfe I.).

Party 5- Tony Empey, Gary Ure, Rob Worona (Perch R., Henderson, N.Y. and area, local areas).

Party 6- David Bree, Margaret Pears, Llew Rintoul (P.E.Pt., Wolfe I., Kingston).

Party 7- Marg Brown, Martin Edwards, Bob & Peggy Ridgely, George Vance, Ron Weir (Amherst I., P.E.Pt.).

Party 8- Miscellaneous participants who submitted casual observations.

	PARTY NUMBERS								
SPECIES	1	2	3	4	5	6	7	8	TOTAL
Red-throated Loon	-	-	-	-	-	-	2	-	2
Common Loon	8	7	12	5	2	6	360	-	400
Pied-billed Grebe	4	4	2	-	1	-	-	-	9
Horned Grebe	16	5	10	3	14	4	110	-	162
Red-necked Grebe	-	-	2	-	-	-	2	-	4
Double-crested Cormorant	-	1	1	-	35	-	1	-	36
Great Blue Heron	1	3	6	3	14	4	-	-	31
Cattle Egret	-	-	-	-	-	-	-	1	1
Mute Swan	-	15	-	-	3	-	-	-	15
Snow Goose	-	50	40	40	-	-	-	4	50
Brant	-	-	50	-	-	-	-	-	50
Canada Goose	8	4090	1500	3000	2000	1000	50	-	6000
Wood Duck	-	2	-	-	1	-	-	-	3
Green-winged Teal	-	1	3	-	-	6	2	-	12
American Black Duck	6	15	18	20	40	20	36	-	155
Mallard	139	124	1000	110	130	30	43	-	1300
N. Pintail	2	6	3	-	9	-	1	-	21
N. Shoveler	3	-	3	-	-	-	-	-	3
Gadwall	110	65	150	-	14	-	9	-	240
American Wigeon	110	118	250	4	206	-	-	-	580
Canvasback	-	10	7	6	6	20	-	-	20
Redhead	1	-	20	-	-	20	-	-	20
Ring-necked Duck	-	300	20	-	3	-	-	-	320
Greater Scaup	30	1820	5000	*	800	1800	250	-	9000
Lesser Scaup	20	12	15	6	2	200	20	-	250
King Eider	-	-	-	-	-	-	1	-	1
Oldsquaw	521	3	5	2	50	4	1500	-	2000
Black Scoter	-	5	10	8	12	10	1	-	25
Surf Scoter	-	6	2	-	-	10	4	-	20
White-winged Scoter	9	21	20	25	100	10	400	-	575
Common Goldeneye	1	320	10	15	65	25	37	-	450

PARTY NUMBERS

SPECIES	1	2	3	4	5	6	7	8	TOTAL
Bufflehead	2	4	15	10	50	30	11	-	100
Hooded Merganser	-	7	30	10	28	-	-	-	60
Common Merganser	-	1	5	2	20	11	24	-	60
Red-breasted Merganser	32	18	30	1	21	-	52	-	100
Ruddy Duck	3	-	-	-	-	-	4	-	4
Turkey Vulture	-	-	-	-	-	-	2	-	2
N.Harrier	2	5	15	-	8	3	13	-	40
Sharp-shinned Hawk	1	-	-	-	2	-	1	-	4
N.Goshawk	-	-	-	1	-	-	-	-	1
Red-tailed Hawk	2	8	10	3	10	3	5	-	41
Rough-legged Hawk	2	4	12	8	2	5	9	-	42
American Kestrel	-	1	6	-	4	1	2	-	14
Gray Partridge	-	-	-	-	6	-	-	-	6
Ring-n. Pheasant	-	-	1	-	-	-	-	-	1
Ruffed Grouse	-	-	-	3	1	5	1	-	10
Sora	-	-	-	-	1	-	-	-	1
American Coot	-	4	20	-	1	-	-	-	25
Black-bellied Plover	4	1	16	-	3	-	4	-	24
Killdeer	-	-	1	-	6	2	-	-	9
Greater Yellowlegs	2	4	6	1	5	6	5	-	25
Lesser Yellowlegs	2	-	3	6	5	4	2	-	20
Solitary Sandpiper	-	-	-	-	1	-	-	-	1
Hudsonian Godwit	3	1	4	1	-	1	1	-	7
Sanderling	-	6	-	-	2	2	4	-	14
Semipalmated Sandpiper	-	30	-	-	-	-	-	-	30
White-rumped Sandpiper	-	2	5	8	1	-	-	-	16
Baird's Sandpiper	-	-	-	-	2	-	-	-	2
Pectoral Sandpiper	-	2	5	4	20	-	-	-	31
Purple Sandpiper	-	-	-	-	-	-	1	-	1
Dunlin	10	24	10	40	20	46	20	-	100
Short-billed Dowitcher	-	-	-	-	4	-	-	-	4
Common Snipe	2	1	10	6	15	1	8	-	43
American Woodcock	1	-	1	-	-	-	1	-	3
Little Gull	-	-	-	-	-	-	1	-	1
Bonaparte's Gull	8	20	50	40	28	10	60	-	216
Ring-billed Gull	78	325	400	*	125	180	600	-	1600+
Herring Gull	12	1	20	6	21	40	265	-	365
Great Black-backed Gull	5	23	8	10	35	12	58	-	151
Common Tern	-	-	-	-	-	-	1	-	1
Rock Dove	63	112	55	20	300	80	25	-	555
Mourning Dove	27	6	20	4	-	15	30	-	102
E.Screech-Owl	-	2	4	-	-	-	1	-	7
Great Horned Owl	1	3	12	3	4	2	3	2	30
Long-eared Owl	-	-	1	-	-	-	-	-	1
Short-eared Owl	1	-	-	-	-	-	1	-	1
N. Saw-whet Owl	3	-	-	-	-	-	5	7	7
Belted Kingfisher	-	-	-	-	2	-	1	-	3
Downy Woodpecker	-	2	6	3	4	6	2	-	23
Hairy Woodpecker	-	-	2	3	-	1	2	-	8
N. Flicker	-	-	-	-	-	-	2	-	2
Pileated Woodpecker	-	-	1	-	2	-	-	-	3

PARTY NUMBERS

SPECIES	1	2	3	4	5	6	7	7	TOTAL
E. Phoebe	-	-	-	-	-	1	1	-	2
Horned Lark	-	11	25	30	-	50	-	-	116
Tree Swallow	-	2	-	-	-	-	-	-	2
Blue Jay	10	11	7	20	24	10	12	-	94
American Crow	24	4	6	-	25	6	25	-	90
Black-capped Chickadee	3	27	15	40	50	-	50	-	185
Red-breasted Nuthatch	-	-	3	-	-	2	-	-	5
White-breasted Nuthatch	-	2	8	4	5	1	-	-	20
Brown Creeper	-	-	1	-	2	2	3	-	8
Winter Wren	1	-	-	-	-	-	-	-	1
Golden-crowned Kinglet	2	1	6	1	8	3	5	-	26
Ruby-crowned Kinglet	-	-	10	-	3	-	2	-	15
E. Bluebird	-	-	-	-	-	3	7	-	10
Hermit Thrush	-	-	-	-	-	2	1	-	3
American Robin	1	5	400	-	26	22	75	-	529
Brown Thrasher	1	-	-	-	-	-	-	-	1
Water Pipit	-	1	2	1	-	-	2	-	6
Bohemian Waxwing	1	-	-	-	-	-	1	-	1
Cedar Waxwing	200	-	20	3	65	120	600	-	800
N. Shrike	-	-	1	-	-	1	-	-	2
European Starling	85	400	200	*	500	140	500	-	1800
Solitary Vireo	1	-	-	-	-	-	-	-	1
Yellow Warbler	-	-	-	-	1	-	-	-	1
Yellow-rumped Warbler	5	-	4	-	8	8	6	-	31
N. Cardinal	-	-	1	-	3	8	4	-	16
Am. Tree Sparrow	4	80	150	25	80	63	30	-	432
Chipping Sparrow	3	-	-	-	-	1	3	-	4
Field Sparrow	-	-	-	1	-	-	-	-	1
Vesper Sparrow	-	-	-	-	-	-	1	-	1
Savannah Sparrow	-	-	-	2	-	-	-	-	2
Fox Sparrow	-	-	-	-	-	-	1	-	1
Song Sparrow	1	11	20	1	25	10	4	-	72
Swamp Sparrow	-	-	1	-	4	-	-	-	5
White-throated Sparrow	-	-	10	1	-	-	1	-	12
White-crowned Sparrow	-	3	-	-	1	-	1	-	5
Dark-eyed Junco	12	3	25	30	6	30	25	-	131
Lapland Longspur	-	-	4	60	-	25	-	-	89
Snow Bunting	50	189	60	200	22	75	104	-	700
Red-winged Blackbird	150	93	250	*	400	80	10	-	1000+
E. Meadowlark	-	2	1	-	-	1	5	-	9
Rusty Blackbird	-	-	300	-	7	2	-	-	300+
Common Grackle	-	-	-	1	1	-	-	-	2
Brown-headed Cowbird	2	22	25	*	-	2	75	-	125+
Purple Finch	-	1	5	-	2	-	25	-	33
House Finch	4	6	20	3	8	15	5	6	67
Red Crossbill	-	-	-	-	-	-	3	-	3
White-winged Crossbill	-	-	10	-	20	-	5	-	35
Pine Siskin	-	-	-	-	6	-	10	-	16
American Goldfinch	7	1	25	6	4	6	35	-	83
Evening Grosbeak	-	-	-	-	15	-	15	-	30
House Sparrow	5	52	200	*	75	80	53	-	465
SPECIES TOTAL	62	73	90	62	84	68	91	5	133

* Seen but not counted

AUTUMN SEASON - 1989 AUG 1 - NOV 30

by Ron D. Weir

Autumn migration extends over the longest period of the calendar year and presents the greatest number of records for summary. Passage of the insect eating birds, including flycatcher, vireos, warblers, appeared normal during August and September. Depending upon which day an observer was at Prince Edward Pt. (P.E.Pt.), she or he was faced either with uncountable numbers swarming through the trees or extremely few birds to be counted. During a number of September nights, many nocturnal migrants were heard over our home and those of Sep 10/11 were especially numerous.

The counting of the night migrants by call resulted in 180 birds per minute passing overhead. Presumably, they were forced to lower flying altitudes by low cloud and the passage of a cold front with light N-NW winds. The passage rate of about 10,800 per hour continued for about 8 hours until just before sunrise, which amount to about 86,400 having flown over during hours of darkness.

Among the few species I am able to identify include Gray-cheeked and Swainson's Thrushes (see species account below). It is interesting to estimate the number that passed over a line joining Kingston to Trenton, which is about 100 km in length. Assuming I could hear the birds calling within 200 metres on either side of the roof of our house, then the 86,400 passed over a 400 metre front. Scaling this number, some 216,000 moved across a 1 km front or 21,600,000 over the line joining Trenton to Kingston. Of course, it is not known whether the density of the night flight was similar between the two cities, but experience has shown that the passage of such a cold front does trigger migration along a broad front.

Mild weather during October included one week of unusually heavy and persistent fog, all of which delayed migrants, especially Saw-whet Owls. The fog is thought to have been responsible for the Sora rail ending up in a cedar tree on Amherst I. (see species account below).

Significant hawk flights occurred Sep 24, Oct 6, 7, 15, Nov 12, 19, five of which were days on weekends when observers could be out. Hawks did move on some weekdays as locals at P.E.Pt. noted the birds but did not keep tallies on numbers or species. Trends set during the past several years were again evident as numbers continue to increase for Red-throated Loon, Golden Eagle, and Lesser Black-backed Gull. However, Loggerhead Shrikes remained scarce.

All but one of the boreal (winter) finches arrive in our area during the period, along with Bohemian Waxwings. Rarities include Eared Grebe, Eurasian Wigeon, Common and King Eiders, Red-necked and Red Phalaropes, Pomarine and Parasitic Jaegers, Laughing and Franklin's Gulls, Dickcissel, and Lark Sparrow.

EARLIEST ARRIVALS

Common Eider	Oct 9 (1 female)	Amherst I.	KFN	1978 Oct 19
Surf Scoter	Sep 17 (1)	Amherst I.	HE	1980 Sep 27

LATEST DEPARTURES

Solitary Sandpiper	Nov 5 (1)	Perch R.	GU *et al*.	1962 Nov 4
Baird's Sandpiper	Nov 5 (2)	Perch R.	GU *et al*.	1985 Nov 3

SPECIES ACCOUNTS

Red-throated Loon - Oct 8 - Nov 19 (9 in all!) Amherst I., Bath Road, P.E.Pt., Wolfe I., KFN

Common Loon - peaks Oct 6 (50), 8 (50), Nov 5 (350), P.E.Pt. KFN

Horned Grebe - peaks Oct 8 (75), 15 (50), Nov 5 (150) P.E.Pt. KFN

Red-necked Grebe - Oct 5-Nov 5 (19 in all) Amherst I., P.E.Pt. KFN

Eared Grebe - Sep 10-17 (1) Amherstview Sewage Lagoon, KH, RW *et al*., 6th autumn record

Double-crested Cormorant - peaks Sep 30 (5000), Oct 15 (3000), P.E.Pt., KFN

Cattle Egret - Nov 3-5 (1) Moscow, Mr. & Mrs. McDonald *et al*. (very late record)

Eurasian Wigeon - Oct 7 (1 male) Bell's I., MJ, GY, RWK, WS., 6th autumn record

American Wigeon - peaks Oct 1 (750), 22 (500), Bell's I., KFN

Redhead - peak Nov 19 (3000), Wolfe I., JHE

Common Eider - Oct 9 (1 female), Amherst I. bar, RDW, BAW, JHE, ME, RW, HRQ, 1st since 1984 and 9th ever for this irregular very rare visitor during autumn and early winter. The bird swam to within 10 paces of the shore at the bar.

King Eider - Nov 5 (1 female), P.E.Pt., GV, RDW, regular rare visitor during autumn and winter.

Ruddy Duck - Sep 17 (1), Oct 4 (1) Amherstview Sewage Lagoons, VPM et al., Nov 3 (1) Rogers Rd. at L.Ontario, DM, Nov 4 (4) Amherst I., KFN.

Turkey Vulture - peaks Oct 7 (200), 6 (150), P.E.Pt., KFN

Osprey - late migrant Nov 2 (1) Little Cat. Creek at King St., GU

Bald Eagle - Nov 11 (1 imm) P.E.Pt., JHE, VPM

Sharp-shinned Hawk - peaks Sep 24 (200), Oct 7 (200) P.E.Pt., KFN

N. Goshawk - Sep 24 - Nov 5 (6 in all) KFN, no invasion or irruption.

Red-shouldered Hawk - peaks Nov 12 (140), 18 (45) P.E.Pt., JHE, RDW

Red-tailed Hawk - peaks Nov 12 (640), Oct 7 (85), Nov 18 (65), P.E. Pt., KFN

Golden Eagle - Sep 30 (1 ad), Oct 8 (2 ad), 15 (1 imm), 21 (1 imm), 28 (1 imm), Nov 18 (1 imm), P.E.Pt., KFN, most ever, migrants with other raptors.

Merlin - Aug 9 - Oct 21 (15 in all), P.E.Pt., KFN, rising numbers

Peregrine Falcon - Sep 9 (1) P.E.Pt., JHE, RDW, 14 (1) downtown Kingston, HE

Sora - Oct 28 (1) Amherst I., AS. This bird was perched in a Red Cedar tree within the owl woods, presumably disoriented when migrating through heavy fog.

Lesser Golden Plover - peak Sep 20 (200) Wolfe I., VPM

Whimbrel - Sep 2 (1), Amherst I., JHE, RDW

Hudsonian Godwit - Oct 14 - Nov 5 (11 in all), KFN

Baird's Sandpiper - Aug 20 - Nov 5 (20 in all!), peak Aug 27 (10), Amherst I., KFN

Purple Sandpiper - Nov 4 (1) Amherst I. bar, MB, GV, RDW

Stilt Sandpiper - Oct 22 (1), Bell's I., RDW

Buff-breasted Sandpiper - Sep 17 (1), Amherstview Sewage Lagoon, VPM, MHE et al.

Red-necked Phalarope - Aug 28 (2) Amherst I. bar, FC, JCN

Red Phalarope - Oct 22 (2) Amherst I. bar, JHE, RDW

Pomarine Jaeger - Oct 6 (1 dark phase), P.E.Pt., KH

Parasitic Jaeger - Sep 24 (1 imm), P.E.Pt., RDW, MB

Laughing Gull - Oct 22 (1 in 1st winter plumage), Amherst I. bar, JHE, RDW, 3rd record

Franklin's Gull - Sep 23 (1 ad), Amherst I. bar, WB

Little Gull - Aug 8-19 (1 imm), Amherst I. bar, RKE et al.; Aug 20 (1 ad) Amherst I., TE, GU; Oct 9 (1) Amherst I., RW; Oct 14 (1 ad) P.E.Pt., RDW et al.; Nov 5 (1 ad) P.E.Pt., KFN; Nov 11 (1 ad) Millhaven, RKE (6 in all).

Lesser Black-backed Gull - Aug 12 (1 in 2nd summer plumage) Amherst I. bar, VPM, JHE; Oct 1 (1 ad) Wolfe I., JHE, ME. Numbers of this newcomer from Europe continue to increase slowly.

Black-legged Kittiwake - Oct 15 (1 imm), P.E.Pt., RDW et al. (FON trip).

Forster's Tern - Aug 19 (1) JHE, VPM, Sep 2 (1 ad), JHE, RDW, 23 (1) WB, Oct 9 (1) RW, all Amherst I.

Yellow-billed Cuckoo - last report Oct 8 (1) Lemoines Pt., K & MC

Saw-Whet Owl - peak night for netting Oct 22/23 (61), P.E.Pt., GV et al.

Eastern Phoebe - peaks Sep 30 (50), Oct 8 (30), P.E.Pt., JHE, RDW

Blue Jay - peak Sep 24 (1500), P.E.Pt., KFN

Common Raven -Aug 23 (2) Chaffey's Lock, NLB, Oct 2 (2) Otter L., R & KC, Oct 15 (1) Morton, MH, Nov 10 (1) Fourteen Island Lake, JI

Boreal Chickadee - Oct 22 (1), Squaw Pt., RKE

Red-breasted Nuthatch - strong flight, peaks Sep 30 (50), 24 (25), 3 (20), Oct 8 (15), P.E.Pt., KFN

Golden-crowned Kinglet - Sep 30 (5000), P.E.Pt., JHE, RDW

Ruby-crowned Kinglet - Sep 30 (5000), P.E.Pt., JHE, RDW

Gray-cheeked Thrush - night migrants calling over my home, 60 per hour x 8 hours, Sep 10/11 (480), Kingston, RDW

Swainson's Thrush - as per Gray-cheeked but 600 per hour, Sep 10/11 (4800), Kingston, RDW

N. Mockingbird - Aug 15 (1) Montreal St., KH; Aug 20 (3) Amherst I., KH, RW; Oct 15 (1) Wolfe I., KFN

Bohemian Waxwing - Oct 29 (2) Canoe Lake Rd., RDW; Nov 5 (1), 12 (7), 19 (1), P.E.Pt., KFN; Nov 12 (20) Otter Lake Sanctuary, FC; 12 (10) Amherst I., AS; 19 (20) Frontenac P.P., RDW

Loggerhead Shrike - Sep 10 (1), RW. Oct 15 (1) VPM, MHE, both P.E.Pt.

Yellow Warbler - Nov 5 (1) Perch R., GU et al., late

Yellow-rumped Warbler - peak Sep 30 (5000) P.E.Pt., JHE, RDW

Dickcissel - Nov 12-16 (1 female) Amherst I. (feeder), AS et al., 1st since 1987

Clay-colored Sparrow - Oct 14 (1) Wolfe I., GY

Lark Sparrow - Oct 8 (1 imm) P.E.Pt., RDW, 1st since 1987

N. Oriole - Nov 19-21 (1 female) Perth Road Village (feeder), J & BP et al. (late and 5th November record ever).

Pine Grosbeak - Nov 19 (5), P.E.Pt., JHE, RDW

Purple Finch - peaks Oct 15 (250), 7 (100), P.E.Pt., KFN

Red Crossbill - Oct 15 (4), Nov 5 (3), P.E.Pt., KFN

White-winged Crossbill - Jul 14 (30) Napanee Lake, FC;, Oct 14-15 (1) Wolfe I., GY et al.; 29 (2) Canoe Lake Rd., RDW; Nov 3 (10) Bicknell's Cres. Kingston, CW; 5 (35) Kingston, 12 (3) Amherst I., AS

Common Redpoll - Nov 12 on, KFN

Pine Siskin - Sep 16 on, strong flight, peaks Oct 7 (200), 8 (150), Sep 30 (150), P.E. Pt., KFN

Evening Grosbeak - Oct 23 (6) Morton, MH, low numbers since then.

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BOOK REVIEW

by Robert B. Stewart

"LEGACY - The Natural History of Ontario"

John B. Theberge, Editor; Mary T. Theberge, Associate Editor and Illustrator; David Barr and Theodore Mosquin, Associate Editors; Don Bonner, Cartographer. 1989. McClelland and Stewart Inc.

A "Coffee Table" book in format and high quality photographic reproductions. but certainly not in content, and that is meant as a compliment. The book is co-sponsored by the Ontario Heritage Foundation and the Federation of Ontario Naturalists. The forty-three authors are a selection of some of the best known writers and educators in the field of natural history in the province. Approximately a quarter of them have spoken to the KFN or at FON meetings sponsored by KFN, and this group includes Ron Weir who did a section on "Owls of the Kingston Region". The "Acknowledgements" near the end of the book recognizes the efforts of many contributors, including the photographers.

Legacy, 397 pages, is divided into five major parts. The first, "A Small Piece of Planet Earth", locates us with respect to global plate tectonics, places us in the continental weather patterns, and provides an overview of the populations of life forms that have existed with the changes in land forms over time.

Part Two, "Provincial Perspectives", begins with sections on geology, followed by soils, then sections on a variety of topics such as wildflowers which places its emphasis on evolution, pollination strategies and why they are where they are. Other

sections include forest ecosystems, several sections on invertebrates, amphibians, reptiles, a large section on birds, another on mammals including man. Each of these chapters deals more with the biology of the subject rather than species lists.

Part Three, "Special Environments" considers areas of special significance such as Point Pelee, the Niagara escarpment, and some of the large parks in Ontario. Again, each section describes the land base, vegetation and the unique biological features.

Part Four, "Vignettes of Nature", is subdivided into major sections based on regions and human development. These include the Carolinian zone, farmlands, urban nature, the Great Lakes and the hardwood-boreal forest. Each of these includes articles on specific topics germane to the particular subject area and of special interest. The farmlands section includes articles on wetlands, the maple sugar bush, and a historical record of the Passenger pigeon in Ontario.

Part Five, "Perspectives on Nature", has two chapters; one by John Livingston and the other by John Theberge. One is a distillation of the author's sense of the naturalist and the intrinsic value of the natural world. The other takes us by another route to an appreciation of the wholeness of nature. This is an ecological approach that identifies us as a part of the whole, with a message that to destroy one is to endanger that whole.

Throughout the book one is impressed by the high quality maps, tables and illustrations that well serve the educational goals of the various authors.

The section on References emphasizes the geo-physical sections of the book with little referencing of the large amounts of natural history data and phenomonology that is presented. It is stated that some of the authors did not feel their treatment of the subject required references. In some cases I can agree and in others I do not. This, in a sense, reflects a personal desire to acquire more information. The biographical sketches of the authors provide something of the background of those educating us in this book. The Index is superb. It is based mainly on geographical place names and on plant, bird and animal species. Although a price of $75.00 may give on pause, the impression that one would get from a reasonable perusal is correct. The content mirrors the illustrations in quality. I am delighted to have been loaned a copy for the purpose of this review and fully intend to add this very excellent book to my collection.

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