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Photo by Editor

Double-crested Cormorant colony, near Baddeck, Nova Scotia, 1963.
(Common and colonial-nesting species get studied; scarce and solitary-nesting birds don't: see Editorial and S.C.O. Column inside.)

EDITORIAL

In a feature article in this issue, Paul James shows that published research on birds in Canada covers the different groups very unevenly. Waterfowl and raptors receive more - and songbirds less - attention than their relative numbers, diversity, and vulnerability, suggest as appropriate. Waterfowl, as game birds, are supported by a small but vocal and well-funded lobby. And waterfowl and raptors are large, visible, and exciting birds of which study is often easy - and easily funded. Songbirds are even more familiar, seen in gardens and parks, and advertising themselves by loud songs and often by bright colours. Yet study of these birds has lagged, and I suggest that this is because funding agencies - and universities - placed too much emphasis on mechanisms of study rather than focusing on needs for information.

Basic information, including breeding, foraging and other behaviour, is prerequisite to management of species and communities, and to design of further studies, and such information is lacking or inadequate for many songbirds. The focus of funding agencies and university graduate schools is on testing hypotheses statistically through use of large samples, with the result that most work is on common or colonial species whose biology is already well-known. Descriptive studies of solitary or secretive birds often involve few observations acquired over long periods in the field, but funding for such studies is scarce and their payoff in theses is uncertain. Unless such birds have been designated as "endangered" or "threatened", classifications that should be based on an existing body of information, they are unlikely to be studied, and opportunities for remedial action before a crisis develops are lost.

How can we ensure that basic descriptive studies of little-known species receive timely attention?

The Editor

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S.C.O. COLUMN: ORNITHOLOGY IN CANADA - RECENT TRENDS IN PUBLICATIONS AND FUTURE NEEDS.

Ornithology in Canada has a long and distinguished history (Cooke 1981; Ouellet 1988), although the Society of Canadian Ornithologists (SCO) was organized little over ten years ago. The SCO soon will be preparing a National Plan for Ornithology to help set research priorities for the future. To assist this process, we present here an analysis of Canadian ornithological publications in 1970-1991.

Methods. We searched the Canadian portion of the Zoological Record (Aves) from 1970 through 1991 for publications on Canadian birds. The worldwide number of avian publications for these years was also noted. Canadian publications were sorted among the 18 avian orders that occur in Canada (Godfrey 1986) to indicate the relative effort devoted to them. As the number of species per order varied, this was expressed as a proportion of total bird species in Canada and compared with the number of publications expressed as a proportion of the total produced. This showed whether an order had received significantly more or less research effort that expected from the number of species in it, assuming that no order was more or less 'important' than another. Spearman rank correlations were used to test whether the number of papers per order had changed over the 22-year period. All this assumes that publication effort is a reasonable measure of research effort and expenditures per order.

Results. In 1970-1991 2.9% of the global output of ornithological literature was Canadian (Table 1). This was about equal to that of Central and South America combined (James 1987). Although in 1983 the United States produced 14.6% of the global output compared with Canada's 2.7%, Canada produced more per capita, and Canada's relative contribution increased significantly over the 22-year period (Table 1; $r=0.610$, $p<0.01$).

The breakdown by order of avian publications (Table 2) showed that Anseriformes, Charadriiformes, and Passeriformes provided 69% of Canadian publication output, and these taxa make up 71% of the Canadian avifauna. Procellariiformes, Cuculiformes, Apodiformes, Piciformes, and

Passeriformes were significantly 'under-represented" (Table 2), with 284 species (49% of the avifauna) but only 32% of the publications. Anseriformes and Falconiformes were significantly 'over-represented' with 72 species (12% of the avifauna) but 31% of the publishing output. The other ten orders were published on in proportion to the numbers of species included (Table 2). Only Podicipediformes, Falconiformes and Galliformes showed significant trends (all increases) in numbers of papers published over the period examined.

Table 1. Canadian ornithological publications compared with world total, 1970-1991, grouped by 4-year means.

Years	World	Canada	
	Number	Number	% of World
1970-1973	4864	89	1.8
1974-1977	6918	134	1.9
1978-1981	8458	238	2.8
1982-1985	9096	282	3.1
1986-1989	10224	374	3.6
1990-1991	10680	278	2.6

Table 2. Numbers and per cent of Canadian bird species and publications by orders, 1970-1991.

Order 1/	Species		Publications			
	No.	%	No.	%	X^2	r_s
GAVI	5	0.9	61	1.2	0.5	0.20
PODI	6	1.0	45	0.9	0.1	0.68 2/
PROC	23	4.0	48	1.0	36.0 2/	-0.09
PELE	11	1.9	149	3.0	2.0	-0.11
CICO	16	2.8	99	2.0	1.6	-0.16
ANSE	49	8.5	1040	20.7	36.5 2	0.19
FALC	23	4.0	514	10.3	20.3 2/	0.64 2/
GALL	16	2.8	205	4.1	2.2	0.43 2/
GRUI	14	2.4	103	2.1	0.3	0.02
CHAR	126	21.8	952	19.0	1.8	-0.39
COLU	6	1.0	40	0.8	0.4	0.06
CUCU	3	0.5	4	0.1	8.0 2/	0.05
STRI	16	2.8	212	4.2	2.6	0.00
CAPR	5	0.9	18	0.4	3.2	0.30
APOD	9	1.6	31	0.6	6.3 2/	0.01
CORA	1	0.2	1	0.1	3.4	0.12
PICI	14	2.4	44	0.9	11.7 2/	-0.07
PASS	235	40.7	1448	28.9	17.1 2/	-0.39
Totals	578		5014			

1/ Orders abbreviated to first four letters only.
2/ Statistically significant ($P<0.05$).

Discussion. Recent trends. Wild birds are highly valued by Canadians. A 1981 survey showed that millions of participants in bird-related activities received direct benefits estimated to be worth $347 million annually (Jacquemot & Filion 1987). If sustained, these benefits have a capitalized economic value of $6.9 billion at a discount (interest) rate of 5%, a conservative estimate of the loss should the resource that sustains such activities be allowed to disappear. The expenditures Canadians made on bird-related recreational activities amounted to almost $2 billion annually (Jacquemot & Filion 1987). These findings excluded the commercial, subsistence, educational, and scientific values of birds to Canadians, and their recreational use by non-residents, and thus are conservative. Also 80% of Canadians believed that the maintenance of abundant wildlife, including birds, was very or fairly important (Filion et al. 1983).

If we assume that knowledge gained through research is pre-requisite to maintenance of Canada's avian resources, we have some problems. For our low human density, our publishing output is quite high (Table 1), exceeding that of the United States on a per capita basis, and it has increased over the period examined. However, the publishing output is uneven with respect to the various taxa, with two orders receiving a disproportionate amount of attention and five others a significant lack of attention. The output has increased significantly for only three orders.

The most obvious reason for these disparities in research effort is that some taxa are more suited than others for scientific enquiry. The abundance of research on Falconiformes arose from the pesticide contamination problems experienced by these birds from the 1950s onward (Newton 1979; Risebrough 1986), resulting in efforts towards their conservation and use as bioindicators, an important role that they will continue to play. Game birds, here principally Anseriformes and Galliformes, have long had an important place in Canadian culture, which probably explains why they received a disproportionate share of the available resources. Reasons for the under-representation of other orders are less obvious. The Procellariiformes are logistically difficult to study because most are offshore visitors here. The 14 species of woodpeckers are consumers of forest insects, but they have received little study. The many forest passerine species may be vulnerable to potential impacts of intensive forest exploitation, both in breeding areas in Canada and wintering areas in Latin America (Robbins et al. 1989; Terbrough 1989), yet these birds were little studied in the period examined.

Future needs. In assessing future needs, two basic questions relate to overall funding levels and to funding distribution among different bird groups. Canada spends less of its gross domestic product on research and development than any other large industrialized nation (Palca & Anderson 1988). Of total federal spending, less than 10% goes to the Department of Environment and the Natural Sciences and Engineering Research Council, two main supporters of ornithological research in Canada. Given that bird projects receive only a tiny fraction of this, the overall level of funding is arguably inadequate.

We have shown that existing funding is inequitably distributed among taxa (Table 2). A disproportionate amount of resources is allocated to game birds, because the hunting of birds is an important economic activity which must be managed in a responsible manner. However, this rationale is now seen to apply to other bird taxa as much as or more than to game birds. Expenditures by Canadians in 1981 on non-game birds totalled almost three times those

on hunting of birds ($1,434 million vs. $513 million; Jacquemot & Filion 1987). On this basis, it could be argued that levels of expenditures on game vs. non-game birds should be reversed, as both are in equal need of scientific management for their conservation. The Canadian Wildlife Service (CWS) is responsible for species protected under the Migratory Birds Convention Act, covering 14 of the 18 orders in Table 2. Yet, as of June 1991, the CWS Progress Notes series included 194 titles, of which 95 (49%) were concerned with waterfowl vs. 60 (31%) with all other birds [The remaining titles dealt with topics other than birds.]. In addition, the North American Waterfowl Management Plan, signed by Canada and the United States in 1986, is expected to channel about $1 billion over 15 years into work on this group, with Canada contributing one-quarter. No programs of such magnitude exist for other bird taxa in Canada, not even a counterpart to the American Partners in Flight program on Neotropical migrant birds.

As of 1993, 36 species of Canadian birds were listed as endangered, threatened, or vulnerable by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), including members of eight orders in Table 2. The passerines have the largest number of species listed (11; 31%) and waterfowl has one of the lowest (2 spp.; 6%), but the distribution of research effort between these orders is the reverse of the apparent need.

We attempted to rank the different orders on recent research output and trend, tropical forest migrant status, and COSEWIC status. The passerines emerged as the highest research priority for the future, followed by cuckoos, swifts, hummingbirds, and woodpeckers. Although Charadriiformes and owls ranked at the third level, their relatively large proportions of COSEWIC-listed species may warrant higher placement. Whatever research priorities are assigned, we strongly urge a more equitable distribution of research resources between game and non-game birds.

We thank Donna Tanton for typing the manuscript, and Alan Smith, Bob Clark, and other friends and colleagues for their thoughts on Canadian ornithology.

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PRESIDENT'S MESSAGE

During the last few months SCO members have been very active. All members should have received the previous issue of Picoides, now back on a regular publication schedule under its new Editor. Also the Directory of Canadian Ornithologists was published early in 1994 and mailed to members by Steve Wendt and associates at CWS. Bruce Falls and Mike Cadman are assembling manuscripts of papers presented at the symposium on bird populations at our joint meeting with the Wilson Ornithological Society in Guelph. The MSS are being edited, and arrangements for funding their publication are in progress; a final announcement should appear in the next issue of Picoides.

The committees on the Speirs and on the Baillie and Taverner awards have made their selections, which will be announced at our 1994 general meeting in Missoula. David Nettleship, our President-Elect, has prepared a slate of candidates for new councillors (1994-96), for whom you will have voted by the time you read this. Results of the election will be made at the general meeting and in Picoides.

There will be at least one meeting of SCO Council in Missoula. Please check for location and time when you get there. The SCO general meeting is scheduled for Saturday, 25 June, 12:00-13:00, and this will be our only occasion to meet there as a group. I urge you to take the opportunity to bring up any SCO affairs or other topics in Canadian ornithology. I look forward to seeing a good Canadian delegation at Missoula.

The XXI International Ornithological Congress will take place in Vienna, Austria, 20-25 August 1994. Canadian participation will be good, and many will be presenting papers. If there is a desire for a gathering of Canadians at the I.O.C., please let me know so I can arrange for a meeting room and a convenient meeting time.

A short word about my situation: I took an early retirement at the end of January 1994, but continue in my research and other ornithological activities. Since 1993, I have accepted a position of Professeur associé, Département de sciences biologiques, Université de Montréal. I also remain a Research Associate at the museum where I have an office and access to collections and laboratory. I thank all those who communicated with me and offered their support after the events of last summer at the museum. It was greatly appreciated.

I extend my thanks to all members of SCO committees for their hard work, and I hope to see many of you at Missoula despite the conflict with field activities.

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REPORTS FROM S.C.O. AWARD WINNERS

1992 TAVERNER AWARD REPORTS

(NOTE: The "1992" reports included in Picoides 6(1): pp.3-6, covered awards made in 1991, not 1992, and reported on work done in 1990-91.)

"Offspring sex ratios, mortality, and relative provisioning of daughters and sons in the Northern Harrier Circus cyaneus. R. Bruce McWhirter, Ohio State University (now at McGill Univ.).

Sex ratio has two main paradigms. The first, proposed by Fisher (1930, The genetical theory of natural selection. Clarendon Press), posits that natural selection will favour parents that invest equally in the

sexes, such that the population sex ratio at the end of the period of parental care should be the inverse of the costs of producing individuals of each sex. The second paradigm supposes that whenever the genetic fitness benefits of producing daughters or sons vary predictably with ecological circumstances individual parents are expected to manipulate the sex ratio of their offspring so as to maximize the number of grand-offspring produced (Gowaty 1991; Current Ornithology, 8:141-171). Offspring sex ratios were documented over 10 years (1980-85,1990-93) for a southeastern New Brunswick population of the Northern Harrier Circus cyaneus, a strongly size-dimorphic hawk. In contrast to a population in the Orkney islands, Scotland, in which the sex ratio at fledging was female-biased (Picozzi 1984, Ibis 126:356-365), sex ratios at hatching and at fledging did not deviate from parity in New Brunswick. However, in Scotland the sex ratio at fledging became progressively less female-biased and eventually male-biased over a 30-year period. In Orkney, but not in New Brunswick, there existed a shortage of males in the breeding population. Despite the larger size of females, daughters and sons were provisioned similar amounts of food during the period of parental care, implying that the sexes similarly affect parent residual reproductive value (that is, the parent's expected contribution to the population through future offspring). These observations are consistent with the expectation of Fisher's (1930) principle of the evolution of population sex ratios, viz. parents should invest equally in daughters and sons, unless the reproductive values, or average expected fitnesses, of the sexes differ, in which case natural selection will favour parents that produce more of the rarer sex. In New Brunswick, a seasonal decline in sex ratio (proportion of males) was evident among fledglings, but not hatchlings, implying a differential increase in mortality among male offspring as the breeding season progressed. Increased mortality among males relative to females was primarily due to an overall seasonal increase in nestling mortality, rather than to sex-specific differences in susceptibility to mortality.

I found little evidence of facultative parental manipulation of offspring sex ratios depending on ecological circumstances at the time of breeding. In New Brunswick, the secondary sex ratio was not correlated with two variables that influence food availability and possibly maternal condition, viz. vole abundance and amount of precipitation in spring. There may not be selection for the manipulation of sex ratios in response to environmental conditions at the time of egg-laying because those conditions do not forecast conditions at the time offspring are being reared. Sex ratios varied non-randomly according to the egg sequence within clutches. Overall, eggs laid first in the clutch were biased towards females, and second and third eggs laid were biased towards males; however, the proportion of females among eggs laid early increased with increasing clutch size. Regardless of clutch size, neither sex predominated in the last egg laid. Sex-biased hatching sequences appear to be a common phenomenon among birds of prey. None of the adaptive hypotheses advanced to explain sex-biased hatching sequences were consistent with the autecology of harriers in New Brunswick, nor could I confirm that the non-random allocation of the sexes within clutches is adaptive. However, growth in females was more strongly negatively asssociated with correlates of reduced food consumption and increased mortality, including high precipitation, late birth date, and late positions within the laying sequence

than was growth in males. Females began flying at an older age and developed flight skills more slowly than males. Furthermore, the ability of fledglings to secure food from parents was strongly influenced by the sequence in which siblings began flying. Thus, a skewing of the sex ratio of first-hatched offspring towards females may enhance the growth, competitive ability, and survival, and hence relative fitness, of daughters. Eggs hatched asynchronously, consequently starvation increased with position in the laying sequence. Yet the proportion of nestlings that died within broods did not increase with brood-size. I propose that the shift towards an even sex ratio among late-hatched eggs is an adaptive mechanism that limits the degree of sex-biased mortality and forestalls the development of a maladaptive sex ratio at the end of the period of parental care.

"Is reproduction in Burrowing Owls limited by food supply?" Troy I. Wellicome, University of Saskatchewan (now at U. of Alta.)

The Burrowing Owl Athene cunicularia is classified as "threatened" in Canada, meaning that it is likely to become endangered and eventually extirpated if the alarming decline in its abundance is not reversed. Unfortunately, the exact causes of this decline remain unknown.

In the past century, the Canadian prairies have been transformed from a natural grassland ecosystem to an agriculture-dominated system. At present, in the more fertile regions, approximately 85% of the land is cultivated and kept free of any natural vegetation. Permanent cover exists only in narrow strips next to roads or creeks and in small pastures; consequently most Burrowing Owls nest in heavily grazed pasture fragments interspersed among croplands. Telemetry studies have shown that the foraging ranges of many of these owls are larger than the pastures in which they nest. The owls must therefore rely on the surrounding agricultural landscape for part of their supply of small mammals, which comprise the majority of their food intake. But can these areas of intensive land use support adequate prey populations?

Burrowing Owls lay between 8 and 11 eggs, but biologists in Canada have noticed that pairs rarely fledge more than 4 or 5 young in agricultural regions. The goal of my research is to determine if food limitation is resulting in low reproductive output for owls in these areas.

I chose to examine food limitation in breeding Burrowing Owls using two complementary approaches: an experimental technique and a correlative technique. I selected a study site of approximately 200 000 ha on the Regina Plains (Saskatchewan), where more than eighty pairs of owls were known to nest. Before egg-laying in 1992 and 1993, I replaced natural burrows with artificial burrows, allowing me to monitor nest contents throughout the breeding season.

Direct effects of food supply

To determine if reproductive output in Burrowing Owls is limited by food intake, it is necessary to compare owls in their normal situation to owls that are definitely not limited by food supply. I accomplished this by adding extra mice to the food caches of a subset of nests, ensuring that these pairs always had an excess of food. Because it is useful to know during which period of the breeding season food is most limiting, I designed food-supplementation experiments to test each of three stages that could constrain the birds energetically: the egg-laying, incubation, and brood-rearing stages.

I provided extra food to 27 of 68 pairs during egg-laying in 1992 and 1993. Supplementally fed owls laid an average of 0.5 more eggs (9.3 vs. 8.8) than did unfed birds in both years, but produced eggs of greater volume only in 1992. Broods that I supplemented during the nestling stage only (n=19) fledged substantially more and heavier young than did broods not supplemented at any stage (n=22). Nestling losses in control nests were associated with cannibalism, where the smallest members of a brood died and were eaten or were killed and then eaten. In 1993, I fed some pairs from the start of egg-laying through the end of the nestling period (n=14), and they did not fledge more young than pairs supplemented for the nestling period alone (average number fledged=7.8). These experiments suggested that, although food restricts the number, and sometimes the size, of eggs that Burrowing Owls lay, it is the food supply during the nestling period that determines the quality and quantity of young that leave the nest.

Effects of natural prey abundance

Given that high levels of food in Burrowing Owl nests increase reproductive output, abundant natural prey in the habitat surrounding nests should also lead to high reproductive output. If so, one would expect a correlation between the natural prey supply of pairs and their reproductive output.

To examine this relationship, I first censused small mammals in each of six habitat types: undisturbed grassland, pasture, cropland, summer-fallow, roadside, and hayland. Habitats associated with periodic plowing (cropland and fallow) had a lower richness of prey than did habitats with permanent vegetative cover. Roadside, undisturbed grassland, and cropland - all habitats with tall vegetation - had the higher numbers of prey. However, crops supported abundant prey only when mature, at which stage the vegetation was probably too tall (>1m) for Burrowing Owls to extract prey. So, despite having a high abundance of prey, cropland may not support available prey. These findings agree with those of telemetry studies that showed Burrowing Owls select grassland and roadside habitats for foraging, but avoid cropland and pasture.

Having identified both high- and low-quality habitat for Burrowing Owl prey, I am currently using aerial photographs to quantify the proportions of each habitat type around 32 unsupplemented nests. I predict that the proportions of high-prey habitats surrounding nests will be positively correlated with reproductive output, and the proportions of low-prey habitats will be negatively correlated with reproductive output.

Preliminary management recommendations

Because my supplementation experiments have shown that reproductive output in Burrowing Owls is limited by the amount of food at nests, and if my correlative work corroborates this finding, I recommend that managers restore or enhance habitats (such as undisturbed grasslands and roadsides) that support abundant, available prey in the vicinity of active owl nests. In regions such as British Columbia and Manitoba, where Burrowing Owls are being re-introduced or intensively managed, I recommend that conservationists maximize fledging success by supplementally feeding owl pairs during the nestling period.

I would like to thank the many organizations that provided financial support for this research. I am especially grateful to the Society of Canadian Ornithologists, Saskatchewan Environment & Resource Management, and World Wildlife Fund, for their generous contributions.

1993 BAILLIE STUDENT RESEARCH AWARD AND TAVERNER AWARDS REPORTS

"Breeding in a dynamic habitat: Individual decisions and fitness consequences." Rachel F. Holt, University of Toronto (mailing address: Forestry, U.B.C.).

Current forestry practices increase the proportion of early successional stages in the forested landscape. This directly impacts biodiversity by altering habitat structure; however, it may also have more subtle effects. For instance, the rate of turnover of early successional stages is much higher than that of later stages. These rapid habitat transitions may have profound implications for populations colonizing these areas. Although the effects of such changes on the structure of communities has been studied, we still have limited knowledge of the effects on individual behaviour and population dynamics. The Mountain Bluebird Sialia currucoides is a secondary cavity-nesting passerine that preferentially nests in open habitats with little vegetation structure, and in recent years has been found colonizing clear-cuts shortly after logging. This report details the results of my 1993 field season and describes future work investigating the consequences, to this species, of living in a dynamic habitat.

The study site (Figure 1) is the Beaverfoot Valley, in the Rocky Mountains near Golden, British Columbia. Logging began in 1968 and has created a mosaic of clear-cuts surrounded by mature forest. There are approximately 70 clear-cuts in the 60 km^2 valley, the majority of which are approximately 45ha. These patches vary in stage of regeneration from open bare areas (logged in 1993) to 20-year-old Lodgepole Pine Pinus contorta and White Spruce Picea glauca stands approximately 4m tall.

In 1993, 24 Mountain Bluebird nests were found in 18 clear-cuts, with a majority of nests in patches between 3 and 16 years old. Bluebird nests were predominantly in cavities made by primary cavity nesters (species which excavate their own nesting holes) in stumps, snags or live trees (83%;n=20). The remaining 17% (n=4) were in 'natural cavities' in hollowed-out burnt logs. Position and type of nest was non-random; mean height of centrally placed nests was 1.9 $\pm$ S.E.2.5m, and nests on the edges of patches were higher at 5.2 $\pm$ S.E.1.6m. This is a straightforward consequence of only having small stumps left in the centre of patches.

Predation

Total nest predation was 30% (n=7 of 24), and there is an indication that the probability of predation may be influenced by placement of nests and nest-types. Of the low nests 43% (7 of 16) were predated whereas none of the high nests (n=5) were predated. Preliminary experiments on patterns of predation suggested that Deer Mice and chipmunks may revisit nests, at least within the season. Six artificial clutches were added to previously predated nests in 1993. Of these, 4 (67%) were predated a second time, a higher rate than the mean predation rate for that nest type. The preliminary data suggest that Mountain Bluebirds should prefer to nest in high edge nests where possible and avoid renesting in previously predated nests.

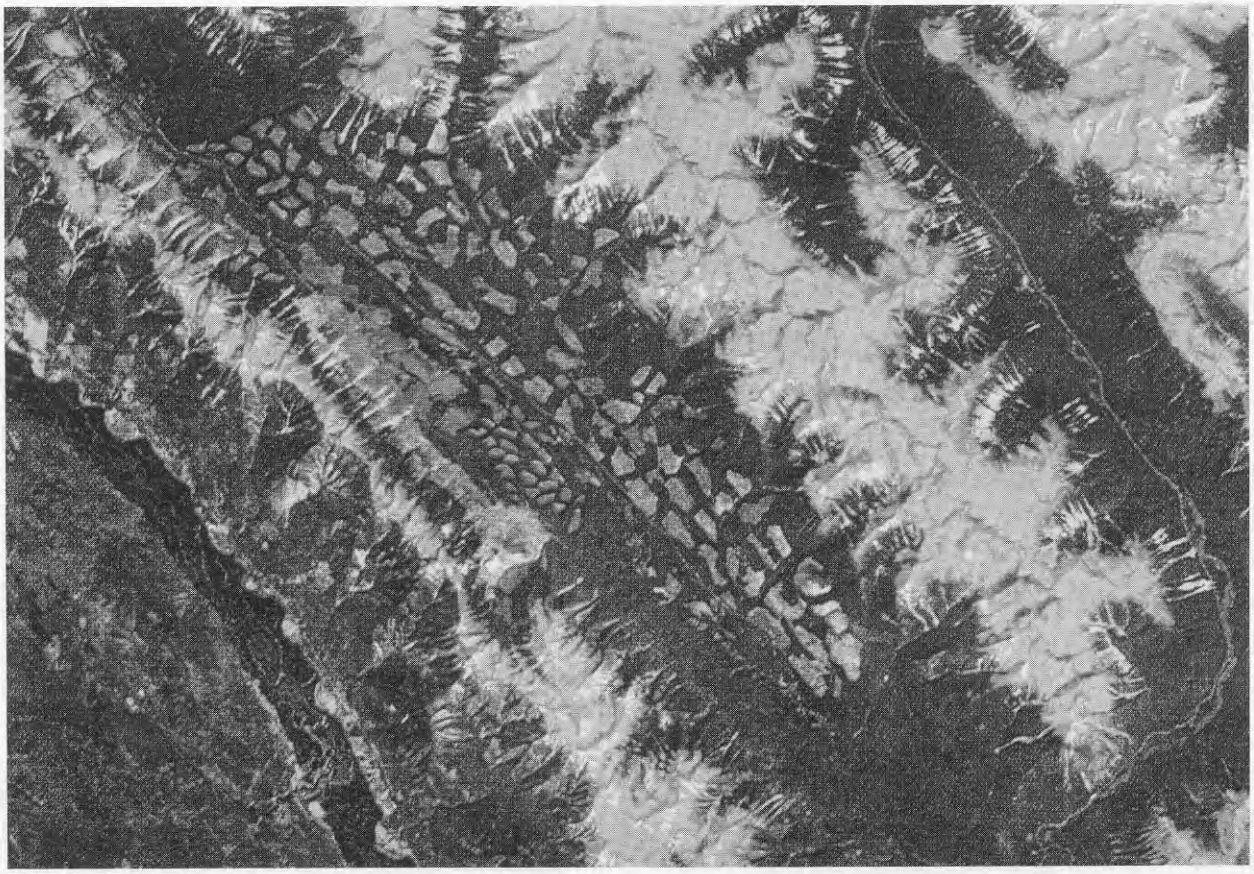

Figure 1. Satellite photograph of study area. Irregular areas (centre of photo) are cut-overs of various ages; adjoining uncut areas (dark) are in National Parks; white areas are mountain ranges (snow-capped).

Vegetation succession

In 1993, the patterns of patch occupancy suggested that the suitability of patches for bluebirds changes with their successional age: the majority of nests were in patches 3-15 years old with few nests in younger or older patches. Initially, birds are prevented from nesting in newly created patches by the lack of nest sites. After a number of years primary cavity nesters excavate cavities, and bluebirds can then establish nests in these patches. There are a number of reasons why bluebirds may not nest in older clear-cuts: vegetation differences may affect foraging efficiency and thus create fitness differences among birds nesting in patches of different ages. There may be differential predation rates across clear-cuts of different ages because predation may increase with cavity age if predators revisit nests, or there may be increased predator density in older patches, or the susceptibility of nests to predation may increase if adults are forced to spend more time foraging rather than defending the nest. Old cavities, which tend to be in old patches, may also have decreased value as a result of high parasite loading or decay.

Experiments

In the 1994 field season I will test these various hypotheses using both manipulative

and mensurative experiments. I will set out nest-boxes in a systematic pattern, with artificial clutches of eggs, to determine whether nest predation is predictable from position within the patch, nest height or patch size. I will also repeat this experiment with 'second clutches' of artificial eggs to determine whether previously predated nest sites have a higher probability of predation.

By increasing the availability of nest sites by adding nest boxes, individuals will be able to make decisions on where to breed, without the constraints of nest-site limitation. They may then choose young patches or old patches or may nest at random, depending on the relative importance of other proximate factors. Observations of the behaviour of adults foraging in patches of different ages will be used to assess whether foraging is less efficient in older patches. The number of young fledged and growth rates of chicks will also be used to assess fitness differences between patches. In addition, experimental manipulations of vegetation will be used to determine whether removal of vegetation affects decisions of where to breed, or whether these decisions are based on other factors such as cavity age or probability of predation.

Conclusion

Using a variety of approaches, I hope to elucidate the proximate factors affecting habitat selection by the Mountain Bluebird. In particular I will assess how the relative importance of these factors changes with time, and thus determine the population consequences to this species of living in a dynamic habitat. Assessment of such factors is especially critical given the rate and scale at which we are currently changing the landscape mosaic through resource extraction and development. Knowledge of the patterns and processes of species' habitat selection and requirements is required before we can hope to understand the full impact of our land-use decisions.

I am very grateful for the financial support provided by the James L. Baillie Memorial Fund through the Society of Canadian Ornithologists to conduct this research.

"James Henry Fleming, 1872-1940: Dean of Canadian Ornithology." Michael S. Quinn, York University.

J.H. Fleming was the epitome of the Victorian amateur naturalist and collector. The use of the adjective 'amateur' is in no sense applied in a derogatory manner, but is meant in its true etymological sense as one who pursues an interest for the sheer love of it. Fleming embodied the rich natural history traditions of the European gentleman naturalist and blended them with the emerging ideas of scientific ornithology in the early twentieth century. He was heir to a legacy that left him independently wealthy and was able to pursue his interests as a full-time avocation. His life and accomplishments illustrate a period of transformation that was witness to a growing separation between amateur and professional in the realm of natural science. Fleming was involved in all facets of Canadian bird study, from international organization to local efforts, and from pure research to conservation advocacy. Fleming's life is therefore an interesting story in its own right and a rich window to a world of yesteryear.

J.H. Fleming began cultivating his natural history interests at a very early age. His first interest was in the plants and butterflies in

his father's horticultural garden, but by the age of twelve his passion had settled on birds. The earliest specimens in his collection date from 1884 and he was known to have purchased hummingbird skins with his lunch money while still in primary school. In 1886 he visited London and the Natural History Museum with his father and settled on the idea of forming an ornithological collection for Canada. In 1905, J.H. Fleming had the first of two additions built onto his Toronto home to house his personal museum and library. The collection and library eventually occupied a three-storey addition and comprised 32,267 specimens representing all of the 27 known orders of recent birds, 163 out of 166 families, 2074 of 2600 genera, and over 6300 species (based on the taxonomy at the time of his death), plus approximately 10,000 library items. When he died in 1940, his collection was the largest and most representative collection of birds and ornithological works in the world.

Many awards and honours were bestowed upon J.H. Fleming during his life time, including the following: Honorary Curator of Ornithology, National Museum of Canada, 1913; Honorary Curator of Division of Birds, Royal Ontario Museum, 1927; Honorary Member Société Ornithologique & Mammalogique de France, 1931; first Canadian president of the American Ornithologists' Union, 1932; Corresponding Member of the Zoological Society of London; Colonial Member of the British Ornithologists Union. In addition, Fleming published more than 80 scientific papers and notes. He was instrumental in the development of the Migratory Bird Treaty/Convention, the National Museums Act, and the establishment of several national parks and wildlife reserves.

J.H. Fleming died in his home on 27 June 1940, of natural causes. On 20 March 1928 he had written a codicil to his will leaving all of his ornithological collection and scientific library to the Royal Ontario Museum. The bequest doubled the size of the ROM bird collection and established its ornithological library as one of the most complete in the country.

Michael Quinn is studying the times and contributions of J.H. Fleming towards a doctoral degree in the faculty of Environmental Studies at York University. The results of his research will be embodied in a dissertation and, hopefully, in a number of papers both scholarly and popular. The 1993 Taverner Award (interestingly, Taverner was Fleming's best and life-long friend) was instrumental in allowing Quinn to visit archives and libraries in Washington, Philadelphia, New York and Cambridge to pursue his research on Fleming.

"Evidence for interspecific influences on habitat selection, habitat use and prey selection in the Least Flycatcher and American Redstart." Paul R. Martin, Queen's University.

The structure of bird communities is characterized by complex species interactions, including predation, parasitism, and competitive interactions. Previous work on Least Flycatchers (Tyrannidae) and American Redstarts (Emberizidae), which frequently co-occur in forest bird communities, suggested that the Least Flycatcher directly influences habitat selection and use in the American Redstart by competitive exclusion. Such complex interaction between relatively distantly related species has implications for a better understanding of factors governing community structure. This in turn could prove

important to the understanding of population dynamics of these two neotropical migrant songbirds.

The goal of this study was to examine in detail differences in ecology between the two species, as well as interspecific interactions that may influence their place within the community. This goal was broken down into the investigation of differences in habitat use, foraging behaviour, and prey use between the two species, as well as documentation of behavioural interactions which could provide information on the influences of one species on the other.

Habitats used by these two species, described using fixed-radius point counts, were found frequently to overlap. but were characterized by different micro-habitat variables. Least Flycatchers frequented areas of even-height, heavy mid-high canopy (6-18m) forest, with more open spaces below 6m. Habitats used by American Redstarts, however, were characterized by a relatively low, broad, and dense canopy (1.5-12m) with denser low undergrowth up to 6m.

More detailed work on interactions between the two species used song-playback experiments to attract American Redstarts (and Black-capped Chickadees as controls) into Least Flycatcher territories, to quantify interspecific aggression. Aggression was found to be relatively high, with over 80% of all redstarts that approached the playback speaker being actively attacked and chased by territorial Least Flycatchers. This was compared to no signs of aggression shown towards approaching Black-capped Chickadees. Overlap in territories of the two species was moderately common, however, suggesting that complete interspecific territoriality, as a rule, does not occur. Previous work suggesting greater overlap between Least Flycatcher territories, and of territories of 1st-year male redstarts relative to adult male redstarts (>1yr old), remains to be confirmed from this study site.

Preliminary data gathered on foraging behaviour and prey utilization must be supplemented with subsequent data before analysis on species differences can be completed. Such subsequent data collection is planned for this coming season, as are further experiments regarding response of Least Flycatchers to American Redstart song, and testing for differential response of Least Flycatchers to first year- and adult-plumaged male American Redstarts, which show delayed plumage maturation.

I am grateful for the funding received from the Taverner Memorial Fund through the Society of Canadian Ornithologists. Other support was received through the Eastern Ontario Model Forest Project and NSERC funding to Dr. Raleigh Robertson at Queen's University. The project was undertaken at the Queen's University Biological Station, Lake Opinicon, Ontario.

NEWS ON BIRD POPULATION MONITORING

A U.S./Canadian Workshop on Monitoring of Landbirds During Migration took place in September 1993, at Simcoe, Ontario. Fifty people from government, universities and NGOs presented 23 technical papers and made recommendations on further program development. It was concluded that validation studies to date support the ability of several existing, standardized migrant monitoring programs to track population trends in locally breeding populations or in species that breed only in areas distant from the monitoring site. Both functions are valuable. The workshop proposed a chain of long-term monitoring sites and further development of extensive programs (i.e. not restricted to a few sites), and suggested an organizational structure to achieve this. Appointment of committees is occurring early in 1994. A summary of the recommendations and/or abstracts of the technical presentations may be obtained from Peter Blancher, Canadian Wildlife Service, Hull, Québec, K1A 0H3.

In October a workshop in California dealt with "The Use of Mist-Nets to Monitor Bird Populations", with about 40 participants from 6 countries. Research papers were presented and recommendations developed on standards for mist-netting in 3 seasons (breeding, migration and other). The focus was on monitoring population trends and demography (reproductive success, survival), with most emphasis on the latter. Recommendations dealt with details of net placement, standardization, hours of operation etc., and information on appropriate analysis and use of results is also included. Anyone using mist-nets for demographic estimates should get a copy of the proceedings, which should appear in a U.S. Forest Service publication. For more information contact C. John Ralph, Redwood Science Laboratory, USFS, 1700 Bayview Drive, Arcata, California 95521 U.S.A..

'A National Monitoring Strategy for Landbirds' was developed by the Canadian Wildlife Service, and is being circulated to interested parties for comment. This document reviews existing population monitoring programs, sets priorities and defines species/geographic gaps where further program development is needed. If you wish to review the draft or receive the final version, contact Connie Downes, Canadian Wildlife Service, Hull, Québec K1A 0H3. The 'Monitoring Strategy' is one step towards a Canadian Landbird Conservation Strategy. Information on the latter may be obtained from Judith Kennedy, at the address above.

Erica Dunn

CANADIAN WILDLIFE SERVICE ACTIVITIES RELATED TO SONGBIRDS

CWS has a Songbird Committee, consisting of CWS employees at Headquarters and in the regional offices who are responsible for or who do research on songbirds. Many of us are fairly new at the job, as several songbird positions were established with Green Plan dollars. The communication and coordinating function of the CWS Songbird Committee is growing in importance, as regional offices are undergoing reorganizations that sometimes disperse former CWS personnel to different units.

Here is a partial list of current or recent CWS activities related to songbirds, selected for general interest and lack of

overlap with other news items in this issue of 'Picoides'. See end of list for addresses.

- Studies on exposure to and effects on birds of anticholinesterases (e.g. carbofuran, fenitrothion, diazenon) (Pierre Mineau, HQ).
- Funding of projects on neotropical migratory birds, through the Latin American Program (Colleen Hyslop, HQ).
- Validation of banding and counting birds during migration as methods of monitoring bird populations (Erica Dunn, HQ).
- Development of regional audio tapes to train Breeding Bird Survey volunteers and others in songbird calls (Connie Downes, HQ).
- Review of route regression analyses of Breeding Bird Survey; power analyses of Forest Bird Monitoring Program (Brian Collins, HQ).
- Review of bird-bander training and education, and preparation of training materials; recommendations to reduce injury/mortality during bird banding (Ellen Hayakawa, HQ).
- Developing new methods of studying effects of forest spraying on songbirds, including energetics and radio telemetry (Solitary Vireo, Swainson's Thrush) (Dan Busby, N.B.).
- Study of influence on breeding birds of varied tree-harvest regimes in stream buffer zones (Gerry Parker, N.B.).
- Breeding Bird Atlas of Quebec due to appear in 1994 in English and in French (J. Gauthier, P.Q.)
- Studies on bird abundance and/or reproductive success in various seral stages of black spruce forests, in exploited vs. non-exploited bogs, in remnant vegetation patches in clearcuts, and in various types of forest and agricultural landscapes in the Abitibi area; Pileated Woodpecker surveys in fragmented and non-fragmented landscape; study on impact of ecological barriers on behaviour of songbirds in boreal forest (Jean-Pierre Savard, P.Q.).
- Analysis of data on relationships between changes in agricultural landscape, farming practices and songbird populations in Quebec (J.-L. DesGranges, P.Q.).
- Studies of bird nesting in grazed and ungrazed fields with special reference to Field Sparrow and Bobolink. Effect of natural tallgrass prairie characteristics on bird use (Luc Bélanger, P.Q.).
- Studies on Loggerhead Shrike and Yellow Rail. Development of a data base on endangered species nesting (Pierre Laporte, P.Q.).
- Forest Bird Monitoring Program has been expanded in Ontario, Wetland Bird Monitoring Program pilot work is underway, and MAPS is being used to investigate habitat requirements for boreal forest birds in NW Ontario (Mike Cadman, Ont.).
- Developing field techniques for studying boreal bird/habitat relationships, to assist forest bird management Decision Support System (Dan Welsh, Ont.).
- Research on DNA analysis to identify breeding grounds of migrants. Study on effect on birds of B.t. spraying in Saskatchewan to reduce spruce budworm (Keith Hobson, Sask.).
- Study in Alberta of effects of insecticide DECIS on songbird productivity (Doug Forsyth, Sask.).
- Monitoring in prairie provinces includes several intensive banding stations, and Forest Bird Monitoring Program (Brenda Dale, Alta.).

- Mist-net program run 4 years in N.W.T. demonstrated low volume of captures. N.W.T. bird checklist being updated for 1994, and review of status of passerines in NWT is underway (J. Sirois, N.W.T.).
- "Birds of Yukon" underway for target completion by 1997. Pilot banding and MAPS conducted near Whitehorse (Wendy Nixon, Y.T.).
- Songbird population monitoring in British Columbia (Rhonda Millikin, B.C.).
- Effects of habitat fragmentation and selective cutting on woodpecker energetics; monitoring Spruce Grouse populations in Yukon; studying effects on birds and mammals of cutting deciduous vegetation from conifer plantations (Kathy Martin, B.C.).

Erica Dunn

For further information on any of the above projects, contact the people listed at the following addresses:

HQ: Canadian Wildlife Service, Hull, Québec K1A 0H3
N.B.: P.O. Box 1590, 63 East Main St., Sackville, N.B. E0A 3C0
P.Q.: 1141 Rte de l'Eglise, P.O. Box 10100, Ste-Foy, P.Q. G1V 4H5
Ont.: 49 Camelot Dr., Nepean, Ont. K1A 0H3
Sask.: 115 Perimeter Rd., Saskatoon, Sask. S7N 0X4
Alta.: Twin Atria No. 2, No. 210-4999-98 Ave., Edmonton, Alta. T6B 2X3
N.W.T.: P.O. Box 637, Yellowknife, N.W.T. X1A 2N5
Y.T.: P.O. Box 6010/100, Whitehorse, Y.T. Y1A 5L7
B.C.: Box 340, 5421 Robertson Rd., Delta, B.C. V4K 3Y3

ARTICLE: BREEDING BIRD SURVEY - SIGNIFICANT POPULATION CHANGES IN CANADIAN SONGBIRDS, 1966-1990

Connie Downes and Erica Dunn, Canadian Wildlife Service, 100 Gamelin Blvd., Hull, P.Q. K1A 0H3

Recently Downes (unpubl.) compiled data from the Breeding Bird Survey (BBS) to determine the status of Canadian landbirds breeding in 3 habitats of particular conservation concern: forest, grassland and scrub. The highlights of her summary and some subsequent work are reported here, in hopes of stimulating research into the causes of significant declines in certain species.

Species that met minimum criteria for BBS coverage were classified by breeding habitat and migration pattern (long- vs. short-distance), as per Droege (1990, with minor modifications). Population trends were calculated for 1966-1990 for Canada and for each of 6 biogeographic regions using a regression analysis (Erskine et al. 1992).

There were more declines than increases in grassland nesters, given that 50% would be expected to decline simply by chance (Table 1). Scrub-nesters also showed a preponderance of decreases, but only with marginal significance.

Grassland species as a group appear to be declining, which suggests that there might be a common cause related to habitat.

A similar analysis for the continent as a whole gave the same result (Droege unpubl.) In all the groupings, however, there were individual species with significant population change. Some of these deserve individual attention as well (Table 2). In addition, there are strong BBS declines in a few species that did not fit the criteria for this particular analysis (notably Yellow-bellied Sapsucker and House Sparrow).

Breeding Bird Survey declines are not sufficient evidence in themselves to stimulate conservation action, but rather are a clue that a closer look is warranted. In some species with fluctuating populations, for example, significant BBS trends can depend heavily on start and end values in the period of years chosen for analysis (e.g. finches, certain warblers). This can be determined by studying patterns in annual indices of population change. In species with persistent declines (e.g. Fig. 1), the BBS evidence should trigger further research.

We urge field workers to focus attention on the population dynamics of the species in which BBS has detected declines, to identify underlying causes and to determine whether (and what) conservation strategies should be undertaken. To obtain graphs of annual indices of particular species, contact the first author.

Literature Cited

Erskine, A.J., B.T. Collins, E. Hayakawa and C. Downes. 1992. The cooperative Breeding Bird Survey in Canada. Can. Wildl. Serv. Progress Notes 199. 14 pp.

Droege, S. and J.R. Sauer. 1990. North American Breeding Bird Survey Annual Summary 1988. U.S. Fish and Wildlife Service, Biol. Rep. 89(13). 16 pp.

Table 1. Percent of species with increasing or decreasing BBS trends.

Classification	No. of species	Percent incr.	Percent decr.	P[1]	% signif incr.	% signif. decr.
By habitat						
Forest	77	45	55	NS	9	14
Scrub	32	38	62	+	6	19
Grassland	24	25	75	*	4	25
By migration pattern						
Long-distance	74	43	57	NS	9	11
Short-distance	61	36	64	NS	8	28

[1] Chi-squared P of difference in proportions of increasing vs. decreasing trends from expected 50:50 ratio (all trends included, significant or not). Significance: + = $0.05<P<0.10$, * = $P < 0.05$.

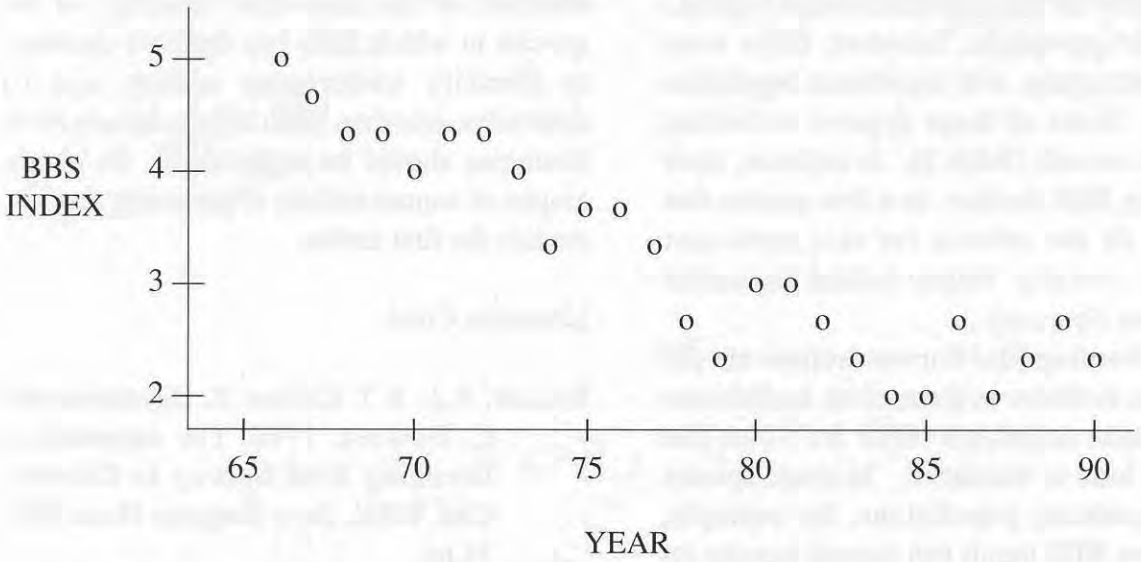

Figure 1. Annual BBS indices for Eastern Meadowlark, for the Canadian breeding range. The graph for Western Meadowlark was very similar.

Table 2. Species in analysis that had significant changes in Canadian BBS, 1966-1990[1]

Increasing Ferruginous Hawk (G,S), Yellow-bellied Flycatcher (F,L), American Robin (-,S), Cedar Waxwing (S,S), Steller's Jay (F,-), Red-breasted Nuthatch (F,S), Philadelphia Vireo (F,L), Red-eyed Vireo (F,L), Solitary Vireo (F,L), Blackburnian Warbler (F,L), Cape May Warbler (F,L), Lincoln's Sparrow (S,L), House Finch (-,S).

Decreasing Killdeer (G,S), Ruffed Grouse (F,-), Blue Grouse (F,-), Sharp-tailed Grouse (G,-), (Ring-necked Pheasant) (G,-), (Band-tailed Pigeon) (G,-), Short-eared Owl (G,S), Great Horned Owl (F,-), Chimney Swift (-,L), Ruby-throated Hummingbird (F,L), Northern Flicker (-,S), Eastern Wood Pewee (F,L), Olive-sided Flycatcher (F,L), Eastern Phoebe (-,S), (Barn Swallow) (-,L), Boreal Chickadee (F,-), Sedge Wren (G,S), Mountain Bluebird (F,S), (Veery) (F,L), Loggerhead Shrike (-,S), Brown Thrasher (S,S), European Starling (-,S), (Nashville Warbler) (F,L), McGillivray's Warbler (S,L), Common Yellowthroat (S,L), Song Sparrow (S,S), Chipping Sparrow (S,L), (Clay-colored Sparrow) (S,L), White-throated Sparrow (S,S), Eastern Meadowlark (G,S), Western Meadowlark (G,S), (Red-winged Blackbird) (-,S), Brown-headed Cowbird (-,S), Common Grackle (-,S), White-winged Crossbill (F,S), Purple Finch (F,S).

[1] Significance at $P < 0.05$ except species in parentheses ($0.05 < P < 0.10$). Letters after species name show breeding habitat (Grassland, Scrub/successional, Forest), and migration pattern (Short- vs. Long-distance). Dash - not included in analysis.

DIRECTORY OF CANADIAN ORNITHOLOGISTS - 1994

An updated directory of ornithologists (in english & french) has been prepared by SCO and the Canadian Wildlife Service (Migratory Birds Conservation). About 500 entries give information on research interests and ornithological activities as well as names and addresses. Many of the people listed are not included in other ornithological directories. We hope to keep it up to date.

Extra copies and a D-Base version on diskette are available for a small charge. For further information, contact Erica Dunn, CWS-NWRC, 100 Gamelin Blvd., Hull, Quebec K1A 0H3

IN PRESS
Current and "In Press" Articles in Canadian Ornithology

CANADIAN WILDLIFE SERVICE, PRAIRIE AND NORTHERN REGION

Diamond, A.W. in press. Seabirds of the Seychelles, Indian Ocean. in Seabirds on islands: threats, case studies and action plans. (Nettleship, D.N., Burger, J., & Gochfeld, M., eds.). Biol. Cons. Ser. no.1, Birdlife International, Cambridge, U.K.

Gratto-Trevor, C.L. & Dickson, H.L. 1994. Confirmation of elliptical migration in a population of Semipalmated Sandpipers. Wilson Bull, 106: 78-90.

Hobson, K.A. & Clark, R.G. Turnover of ^{13}C in cellular and plasma fractions of blood: implications for nondestructive sampling in avian dietary studies. Auk, in press.

Hobson, K.A., Piatt, J.F., & Pitochelli, J. Using stable isotopes to determine seabird trophic relationships. J. Anim. Ecol. in press.

Holroyd, G.L. 1993. Dark secrets. Discovering the unusual habits of the Black Swift. Birder's World, 7(5): 22-25.

INSTITUTE FOR WETLAND AND WATERFOWL RESEARCH

Alisauskas, R.T. & Arnold, T.W. American Coot. in The management of migratory shore and upland game birds (Tacha, T.C. et al., eds.) Texas A&I Univ. Press, Kingsville. in press.

Arnold, T.W. Effects of supplemental food on egg production in American Coots. Auk, in press.

Arnold, T.W. A roadside transect for censusing breeding coots and grebes. Wildl. Soc. Bull., in press.

Gabor, T.S., Gadawski, T.R., Ross, R.K., Rempel, R.S., & Kroeker, D.W. Visibility bias of waterfowl brood surveys using helicopters in the Great Clay Belt of northern Ontario. J. Field Ornithol., in press.

ROYAL SASKATCHEWAN MUSEUM

Hjertaas, D. & James, P.C. Operation Burrowing Owl: the first five years. Raptor Res. Rep. in press.

James, P.C. The status of the Burrowing Owl in North America. Raptor Res. Rep. now published.

James, P.C. 1994. Northern Hawk Owl irruptions in Saskatchewan: 1990/91 and 1991/92. Blue Jay, 52: 25-28.

James, P.C., Ethier, T.J., & Toutloff, M.K. Parameters of a declining Burrowing Owl population in Saskatchewan. Raptor Res. Rep. in press.

Sodhi, N.S., Oliphant, L.W., James, P.C., & Warkentin, I.G. 1993. Merlin (Falco columbarius). In The Birds of North America. No.44. American Ornithologists' Union.

Warkentin, I.G., Parkin, D.T., James, P.C., & Oliphant, L.W. Lack of extra-pair fertilization in Merlins revealed by DNA fingerprinting. J. Molec, Ecol. in press.

UNIVERSITY OF ALBERTA

Hunt, L.E. 1993. Diet and habitat use of nesting Prairie Falcons (Falco mexicanus) in an agricultural landscape in southern Alberta. M.Sc. thesis, 61pp. (student of G. Holroyd)

UNIVERSITY OF REGINA

Bayne, E.M. & Brigham, R.M. Prey selection and foraging constraints in Common Poorwills (Phalaenoptilus nuttallii: Aves, Caprimulgidae). J. Zool. (London) in press.

Brigham, R.M. & Trayburn, P. Brown fat in birds? A test for the "mammalian" brown adipose tissue-specific mitochondrial uncoupling protein in Common Poorwills. Condor in press.

Caada, R.D. & Brigham, R.M. Breeding biology of the Common Poorwill (Phalaenoptilus nuttallii) at the northern edge of its distribution. J. Field Ornithol. in press.

Caada, R.D. & Brigham, R.M. Reproduction constrains the use of daily torpor by free ranging Common Poorwills (Phalaenoptilus nuttallii). J. Zool. (London) in press.

Forbes, M.R.L., Clark, R.G., Weatherhead, P.J., & Armstrong, T. Risk taking by female ducks: intra- and interspecific tests of nest-defense theory. Behav. Ecol. Sociobiol. in press.

Kissner, K.J. & Brigham, R.M. 1993. Evidence for the use of torpor by incubating and brooding Common Poorwills (Phalaenoptilus nuttallii). Ornis Scand. 24: 333-334.

Sherry, D.F., Forbes, M.R.L., Ivy, G.O., & Khurgel, M. 1993. Females have a larger hippocampus than males in the brood parasitic brown-headed cowbird. Proc. Nat. Acad. Sci. U.S.A. 90: 7839-7843.

Zurowski, K.L. & Brigham, R.M. Does use of doubly labeled water in metabolic studies alter activity levels of Common Poorwills? Wilson Bull. in press.

UNIVERSITY OF SASKATCHEWAN

Bortolotti, G.R. Effect of nest-box size on nest-site preference and reproduction in American Kestrels. J. Raptor Res. in press.

Wiebe, K.L. & Bortolotti, G.R. Energetic efficiency of reproduction: the benefits of asynchronous hatching for American Kestrels. J. Anim. Ecol. in press.

Wiebe, K.L. & Bortolotti, G.R. The role of food in determining hatching spans of birds: energetic constraints or facultative manipulation. Ecology in press.

Wiebe, K.L. & Bortolotti, G.R. Food-dependent benefits of hatching asynchrony in American Kestrels (Falco sparverius). Behav. Ecol. Sociobiol. in press.

CANADIAN ORNITHOLOGISTS AND THEIR WORK

ROYAL SASKATCHEWAN MUSEUM/UNIVERSITY OF REGINA

Rick Espie - M.Sc. (James) - Feeding ecology and habitat selection in Piping Plovers.

Paul James - Population ecology of raptors and endangered species. Economic value of birds. Steady-state economics.

Kurt Mazur - M.Sc. (James) - Home range and habitat selection by Barred Owls in the boreal forest.

Terry Smith - B.Sc. (James) - Population ecology of Cooper's Hawk.

Robert Warnock - M.Sc. (James) - Effect of habitat fragmentation on Burrowing Owls.

UNIVERSITY OF REGINA

R. Mark Brigham - Physiological and behavioural ecology of goatsuckers: specifically, convergence in the use of torpor and foraging strategies between these birds and insectivorous bats.

Mark Forbes - Life history variation in birds; Ecology and evolution of bird parasites.

Glenn C. Sutter - Ph.D. (Brigham) - Impact of ecological crunches (drought) on reproduction and energetics of grassland songbirds.

Kaili Wang - M.Sc. (Brigham) - Roost and nest site habitat selection by Common Poorwills.

SOME RECENT OR IMPENDING PUBLICATIONS OF INTEREST

Ornithology in Ontario. Martin K. McNicholl & John Cranmer-Byng, eds.

This work was first publicized several years ago, and it finally is expected to appear in 1994. A good read is promised, even for those who live outside Ontario.

Breeding Birds of Ontario: Nidiology and Distribution. George K. Peck & Ross D. James.

Revisions to vol. 1 (publ. 1982) of the above work are being published, in Ontario Birds, the first two parts in vol.11 (1993) and the final part in 1994.

Dictionnaire Étymologique des Noms d'Oiseaux du Canada. L. Gary Donovan & Henri Ouellet. $39.95. publ. par Guérin, 4501, rue Drolet, Montréal, Québec H2T 2G2

The Proceedings of the Third Prairie Conservation and Endangered Species Workshop (1993, Provincial Museum of Alberta Natural History Occasional Paper no. 19). includes 99 papers (384 pp), including the Prairie Conservation Action Plan. $15 (payable to TWS Man. Branch), available from Dan Chranowski, Manitoba Wildlife Branch, 1129 Queens Ave., Brandon, Man. R7A 1L9. [Proceedings of the earlier workshops are still available, but from Blue Jay Bookshop, box 4348, Regina, Sask. S4P 3W6 (2nd) and from the Edmonton Natural History Club, box 1582, Edmonton, Alta. T5J 2N9 (1st).]

"Birds in the [western] Boreal Forest" (1993, publ. by Forestry Canada, Dieter Kuhnke, ed.), Proceedings of the workshop in Prince Albert, Sask., March 1992. 254pp.

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