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Northern Gannet - White Horse Island, N.B.
(photo by Tony Diamond)
[First recent nesting record in province - small chick under brooding adult.]

Society of Canadian Ornithologists
Société des Ornithologistes du Canada

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President: Dr. Tony Diamond, ACWERN, P.O. Box 45111, University of New Brunswick, Fredericton, N.B. E3B 6E1. Voice: 506-453-5006 (AM), 506-453-4926 (PM); fax: 506-453-3583 (AM), 506-453-3538 (PM); e-mail: diamond@unb.ca

Vice-President (President-elect): Dr. Kathy Martin, (**UBC**) Dept. of Forest Sciences, University of British Columbia, 2357 Main Mall, Vancouver, B.C. V6T 1Z4; Voice: 604-822-9695; fax: 604-822-5410 or 822-9102; e-mail: kmartin@unixg.ubc.ca
(**CWS**) Pacific Wildlife Research Centre, Canadian Wildlife Service, 5421 Robertson Rd., R.R.1, Delta, B.C. V4K 3N2; Voice: 604-940-4667; fax: 604-946-7022; e-mail: as above.

Secretary (Membership): Dr. Nancy Flood, Dept. Biological Sciences, University College of the Cariboo, 900 McGill Road, Box 3010, Kamloops, B.C. V2C 5N3. Voice: 250-828-5436; fax: 250-828-5450; e-mail: nflood@cariboo.bc.ca

Treasurer: Dr. Tom E. Dickinson, Dept. Biological Sciences, University College of the Cariboo, 900 McGill Road, Box 3010, Kamloops, B.C. V2C 5N3. Voice: 250-828-5447; fax: 250-828-5450; e-mail: tdickinson@cariboo.bc.ca

Recording Secretary: Dr. Peter Blancher, National Wildlife Research Centre, Can. Wildl. Serv., DOE, 100 Gamelin Blvd., Hull, Qué. K1A 0H3. Voice: 819-997-6086; fax: 819-953-6612; e-mail: peter.blancher@ec.gc.ca

Editor of S.C.O. Bulletin *Picoides*: Dr. Tony Erskine, Canadian Wildlife Service, DOE, P.O. Box 6227, Sackville, N.B. E4L 1G6. Voice: 506-364-5035; fax: 506-364-5062; e-mail: tony.erskine@ec.gc.ca.

Members of Council: [Councillors marked * are in 2nd terms]

elected December 1997:

* Mr. Michael Bradstreet, Long Point Bird Observatory, P.O. Box 160, Port Rowan, Ont. N0E 1M0. Voice: 519-586-3531; fax: 519-586-3532; e-mail: mswb@nornet.on.ca

* Mr. Michael Cadman, Canadian Wildlife Service, DOE, 75 Farquhar Street, Guelph, Ont. N1H 3N6. Voice: 519-826-2094; fax: 519-826-2113; e-mail: cadmanm@aestor.am.ec.gc.ca

Dr. Fred Cooke, CWS/NSERC Chair - Wildlife Ecology, Dept. Biol. Sci., Simon Fraser University, Burnaby, B.C. V5A 1S6. Voice: 604-291-5610; fax: 604-291-3496; e-mail: fcooke@fraser.sfu.ca

* Dr. Keith A. Hobson, Canadian Wildlife Service, DOE, 115 Perimeter Road, Saskatoon, Sask. S7N 0X4. Voice: 306-975-4102; fax: 306-975-4089; e-mail: hobson@sask.usask.ca

Dr. Erica Nol, Head, Dept. of Biology, Trent University, Peterborough, Ont. K9J 7B8. Voice: 705-748-1424; fax: 705-748-1205; email:enol@trentu.ca

Dr. Jean-Pierre Savard, Service canadien de la faune, 1141, route de l'Église, 9th floor, c.p.10100, Sainte-Foy, Qué. G1V 4H5. Voice: 418-648-3500; fax: 418-649-6475; e-mail: jean-pierre.savard@ec.gc.ca

elected December 1998:

* Dr. David Bird, Macdonald Coll., McGill Univ., 21,111 Lakeshore Rd., McDonald Stuart Bldg MS2072, Ste-Anne-de-Bellevue, Qué. H9X 3V9; Voice: 514-398-7760; fax: 514-398-7990; e-mail: bird@nrs.mcgill.ca

Dr. Stephen Flemming, Gros Morne National Park, P.O. 130, Rocky Harbour, Nfld. A0K 4N0. Voice: 709-458-2417; fax: 709-458-2059; e-mail: stephen_flemming@pch.gc.ca

Dr. Marty Leonard, Dept. of Biology, Dalhousie University, Halifax, N.S. B3A 4J1. Voice: 902-494-2158; fax: 902-494-3736; e-mail: mleonard@is.dal.ca

Dr. Karen Wiebe, Dept. of Biology, Univ. of Saskatchewan, Saskatoon, Sask. S7N 5E2. Voice: 306-966-4406; fax: 306-966-4461; e-mail: wiebek@duke.usask.ca

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BIRDS 2000 - LIVING ON THE EDGE

Joint Millenial Meeting of the American and British Ornithologists' Unions and Society of Canadian Ornithologists

Memorial University of Newfoundland, St. John's, Nfld.
14-19 August 2000

LIVING ON THE EDGE: The Edge of the Continent
The Edge of the North Atlantic
The Edge of the Arctic
The Edge of Extinction and Preservation
and
The Edge of the New Millenium

Dates to note: 5-13 August - pre-conference tours;
14 August - business meetings;
15-19 August - conference, including tours (17th) and banquet (19th);
20-31 August - post-conference tours.

For information on sessions, submitting abstracts, accomodations, etc., please contact (until further notice):
Dr. W.A. (Bill) Montevecchi,
Biopsychology Programme & Ocean Sciences Centre,
Memorial University of Newfoundland,
St. John's, Nfld. A1B 3X9
ph: 709-737-8496; fx: 709-737-2430; em: mont@morgan.ucs.mun.ca

PRESIDENT'S MESSAGE

My term as President comes to an end just when I was beginning to feel I had the hang of it and had some idea what to do! I am sure I am not the first to feel this way, and will not be the last - if we continue with two-year terms of office. My term was somewhat overwhelmed by editing and producing the Proceedings of the Fredericton meeting, which taught me a lot about time management; I would like to take this opportunity to thank everyone for their patience, and particularly the contributors who had to wait far too long to see their work in print. One consolation is that I can now provide reams of advice to the Publications Committee on pitfalls to avoid in producing subsequent publications. The volume goes to press this month and should be in members' hands by Christmas.

One result of this delay was to demonstrate that the strategy of building a journal on a succession of meeting-based publications had not worked for us; accordingly Council, at its meeting in Montréal, decided to proceed directly to journal production. I applaud this decision and will work hard to help implement it. To be successful, our journal will have to establish high standards and a strong clear profile from the outset; it will need solid support from its members, most obviously in submitting high-quality material. I look forward to working with our new President, Kathy Martin, the Publications Committee, Council, and all members, to make the journal something we can be proud of.

My term coincided with the establishment by the Society of regular Scientific Meetings, which I trust will continue. Council may decide (as discussed in Montréal) to meet separately in alternate years and jointly with another North American ornithological group in between; our next meeting, with the A.O.U. and B.O.U. in St. John's, would allow us to move smoothly into such a pattern. Whatever is decided, I hope the Society will continue to diversify its activities and begin to increase its membership to support and perpetuate its increasingly active role in Canadian ornithology.

I close by thanking Council for its support over my four years as Vice-President and President. I particularly wish to thank Peter Blancher for his assiduous patience as Recording Secretary, and our officers and editor - Tom Dickinson and Nancy Flood, Tony Erskine - for their continuing outstanding work as Treasurer and Membership Secretary, and *Picoides* Editor, respectively. Councillors (and especially Presidents) come and go, but it is the long-serving functionaries of the Society who keep the essential activities running smoothly. I am delighted they have all agreed to continue serving. To my successor Kathy Martin I wish a successful term, knowing that she will have solid support from these people and her Past-President.

18th ANNUAL MEETING and 4th CONFERENCE of the SOCIETY OF CANADIAN ORNITHOLOGISTS

McGill University, Montréal, Qué.

5-7 August 1999

SCIENTIFIC PROGRAM (chair: G. Seutin)

FRIDAY, 6 AUGUST 1999 / VENDREDI, LE 6 AOÛT 1999
(Redpath Museum, auditorium)

0900-0910 Introduction - G. Seutin
0910-1000 The demography of Marbled Murrelets of the Sunshine Coast, B.C.: An update - F. Cooke

Symposium I - Endangered species/Espèces en danger de disparition (Chair/Président: D. Bird)

1020-1040 Factors affecting Piping Plover productivity at Lake Diefenbaker, Saskatchewan - J.P. Goossen and T. Jung
1040-1100 Piping Plover recovery efforts in Atlantic Canada - A. Boyne and D. Amirault
1100-1120 The effects of predation and subsequent predator control at a Roseate Tern colony in Nova Scotia - B. Whittam et al.
1120-1140 Captive propagation of Loggerhead Shrikes at the Avian Science and Conservation Centre, McGill University - D.M. Bird et al.
1140-1200 Colonization followed by extirpation: the Greater Prairie-Chicken on the northern Great Plains - C.S. Houston

Symposium II - Species at risk/Espèces menacées (Chair/Président: J.-P. Savard)

1340-1400 Marbled Murrelet conservation: making effective decisions with a poorly understood species - G. Kaiser and L. Lougheed
1400-1420 Seasonal variation in body mass of Marbled Murrelets in British Columbia, Canada - C.L. Hull et al.
1420-1440 First incubation, rearing and release of a Marbled Murrelet (*Brachyramphus marmoratus*) - D.B. Lank
1440-1500 Using age ratio surveys to assess recruitment of Harlequin Ducks - C.M. Smith et al.
1500-1520 Near-extirpation: how we almost lost the Upland Sandpiper - C.S. Houston
1540-1600 Lake Erie Bald Eagles - L. Shutt and B. Whittam
1600-1620 Basal area preference of VTE and other forest songbirds in a managed forest in southwestern Ontario - J.D. McCracken et al.

1630-1815 ANNUAL GENERAL MEETING / RÉUNION ANNUELLE

SATURDAY, 7 AUGUST 1999 / SAMEDI, LE 7 AOÛT 1999

Symposium II (cont./suite) - (Chair/Président: P. Laporte)

0900-0920 Bicknell's Thrush in Québec: distribution, habitat and status - Y. Aubry et al.
0920-0940 Habitat preferences of Bicknell's Thrush in southern Québec - V. Connolly et al.
0940-1000 Distribution, feeding and nesting ecology of the Black-backed Woodpecker in the eastern boreal spruce forest - A. Nappi et al.
1000-1020 Habitat preferences and activity budgets of Dunlin (*Calidris alpina pacifica*) wintering in the Fraser River delta, and the influence of predation risk - P.C.F. Shepherd and D.B. Lank

Symposium III - Identifying endangered species/Identifier les espèces en danger (Chair/Président: S. Nadeau)

1040-1110 Saving the birds - twelve years on - A.W. Diamond

1110-1140 Towards a better understanding of the status of imperilled birds in Canada - C. Hyslop and M. Gosselin
1140-1200 Range data from bird field guides: a note of caution regarding their use in a conservation context - G. Seutin and C. Dyer

Symposium IV - Protection and recovery/Protection et rétablissement (Chair/président: E. Dunn)

1400-1420 Regional conservation related to seasonal biodiversity and rarity - A. Cyr and J. Larivée
1420-1440 Priorization: a potentially dangerous exercise - J.-P. L. Savard
1440-1500 Conservation of at-risk bird species by the Canadian Important Bird Areas (IBA) program - L. de Forest
1500-1520 Municipal planning and bird conservation - A. Couturier
1540-1600 Improving avian recovery in Canada: a role for researchers - S. Nadeau and K. Prior
1600-1620 Bird recovery in Australia - V.-J. Russell

1620-1720 Discussion - leader: G. Seutin

1720-1800 Conclusion - G. Seutin

Poster papers, presented throughout the sessions in a room adjoining the auditorium, are listed below (among Abstracts).

ABSTRACTS

Bicknell's Thrush in Québec: distribution, habitat and status. *Aubry, Yves* (Serv. can. faune, Ste-Foy, Qué.), *Gilles Seutin, Ghislain Rompré, Véronique Connolly* (Dep. Geogr., McGill Univ., Montréal, Qué.) and *Jean-Pierre Savard* (SCF, as above).

In Québec, the distribution of Bicknell's Thrush (*Catharus bicknelli*) is limited to the southern part of the province, east of 72°W and south of 50°N. As in other parts of its range, it has disappeared from some historical sites. In Québec, Bicknell's Thrush occurrence is intimately linked to balsam fir forests. Although balsam fir is widespread, the thrush is only found locally in mature coastal and subalpine fir-dominated forests, and in high-altitude balsam fir second-growth. The latter habitat is apparently occupied at a specific stage of succession, when trees are at least 2-3m high and the undergrowth extremely dense, corresponding to 10-20 years after logging. Precommercial thinning, which reduces stem density from about 30,000 to 3,000/ha, seems to modify the habitat to an extent that makes it unsuitable for Bicknell's Thrush. In both mature and second-growth forests, Bicknell's Thrush is found at densities of 0.75-1.25 males/ha. Gross generalizations about habitat preferences and population densities of this specialist have led to an overall misunderstanding of its status in Québec. Future research and monitoring efforts are needed to establish demographic parameters and obtain accurate population size estimates.

Use of vocalizations by Bicknell's Thrush (*Catharus bicknelli*). *Ball, Melanie*, and *Cynthia Staicer* (Dep. Biol., Dalhousie Univ., Halifax, N.S.) [POSTER PAPER]

Little is known about the vocal behavior of Bicknell's Thrush, which inhabits high-altitude, dense, stunted coniferous forest. Due to the difficulty of seeing Bicknell's Thrush in the field, vocalizations may prove key to future monitoring of this species. Goals of this project are: (i) to determine repertoire characteristics for Bicknell's Thrush, and (2) to quantify daily and seasonal activity patterns, to determine the best times to detect territorial males. Field work was conducted June-July 1999 on a population inhabiting mountain slopes of the Gaspé Peninsula, Québec. Focal males in this study included some fitted with radio-transmitters and color-banded as part of an ongoing population study conducted by G. Seutin (McGill Univ.) and Y. Aubry (Serv. can. faune, Qué.). Vocal activity patterns were quantified by counting songs and calls for 24-hr periods at intervals throughout the breeding season. A preliminary examination of song and call repertoires suggests males share call-types but have unique song-types and a repertoire of more than one song.

Captive propagation of Loggerhead Shrikes at the Avian Science and Conservation Centre, McGill University. *Bird, David M., Ian J. Ritchie, and Oliver P. Love* (Avian Sci. Cons. Cen., McGill Univ., Ste-Anne-de-Bellevue, Qué.)

Although once considered a fairly common breeding bird in the eastern provinces and northeastern states, populations of the eastern subspecies of the Loggerhead Shrike (*Lanius ludovicianus migrans*) have drastically declined over the past 50 years. As a result, the eastern population was designated as endangered by Canadian federal and provincial governments, and measures were taken to preserve the dwindling population. In 1998, as part of the national shrike recovery program, three pairs of eastern Loggerhead Shrikes were bred in captivity for the first time, at the Avian Science and Conservation Centre. Pairs were kept in spacious outdoor planted aviaries, and one pair successfully fledged four young. Nests were built primarily by females of natural materials (twigs, grasses, hay and animal hair) in provided wire baskets; parents were fed a variety of foods including previously thawed day-old chickens, *Tenebrio* larvae and crickets, supplemented with multivitamins. In 1999, 9 pairs were bred at the Centre, providing the base for a large captive breeding colony in conjunction with the Toronto Zoo, the second partner in this important captive breeding effort.

Piping Plover recovery efforts in Atlantic Canada. *Boyne, Andrew, and Diane Amirault* (Can. Wildl. Serv., Sackville, N.B.)

Recovery of the endangered Piping Plover (*Charadrius melodus*) remains the focus of many conservation groups in Atlantic Canada. However, despite their efforts, results from international censuses undertaken in 1991 and 1996 showed that the numbers of plovers nesting in the region declined by more than 15%. During the same period, the number of Piping Plovers nesting in the eastern United States increased by almost 50%. Currently we do not understand why the population trends are so drastically different between the two regions. Predation, human disturbance, and habitat change are often cited as reasons for the decline in Atlantic Canada; however, no one is sure whether it is low fledging success, low adult or juvenile survival, a source-sink effect, or a combination of factors, that is actually driving the population decline. It has also been suggested that some birds may be short-stopping in Atlantic U.S. on their northward migration. In 1998 a banding project was initiated in Atlantic Canada to study the survival and dispersal of Piping Plovers from this region. We will discuss the ongoing Piping Plover recovery efforts in Atlantic Canada, provide some possible explanations for the regional decline, and briefly touch on some of the preliminary results from the banding study.

Habitat preferences of Bicknell's Thrush in southern Québec. *Connolly, Véronique, Gilles Seutin, Ghislain Rompré* (Dep. Geogr., McGill Univ., Montréal, Qué.) *Yves Aubry*, and *Jean-Pierre L. Savard* (Serv. can. faune, Ste-Foy, Qué.)

Bicknell's Thrush (*Catharus bicknelli*) is a candidate for designation as a species at risk in Canada. Formulation of effective management practices for its protection is impeded by a poor understanding of its ecology. Bicknell's Thrush is known to breed predominantly in high-elevation spruce-fir forests throughout its range; however, there is very little quantitative information on habitat preferences. We conducted a detailed habitat characterization of 42 sites occupied by Bicknell's Thrush and 19 unoccupied sites on Mt. Mégantic and Mt. Gosford, Estrie region, Québec. Occupied sites were dominated largely by balsam fir, whereas unoccupied sites had a larger component of hardwoods. Compared to unoccupied sites, occupied sites had lower percent ground cover of herbaceous plants, higher percent ground cover of mosses, more dead fallen trees >10 cm diameter, more snags and stumps, and higher tree density (Mann-Whitney tests; $p<0.01$). Although many habitat differences between occupied and unoccupied sites were consistent across both mountains, there were some clear differences between occupied sites on the two mountains. These results demonstrate local variation in habitat preferences of Bicknell's Thrush that are related to the forestry history of the region.

The demography of Marbled Murrelets of the Sunshine Coast, B.C.: An update. *Cooke, Fred* (Dep. Biol., Simon Fraser Univ., Burnaby, B.C.)

Scientists from the C.W.S./N.S.E.R.C. Chair of Wildlife Ecology, B.C. Environment Ministry, and Canadian Wildlife Service have been studying a population of the threatened Marbled Murrelet (*Brachyramphus marmoratus*) on the Sunshine Coast of British Columbia since 1994. The species presents major difficulties for study as it nests in remote sites in old-growth forests of the Pacific Coast. Up to 1993 only a single active nest had been found in Canada. Using a variety of capture techniques, including over-water mist netting and night-lighting, more than 1300 individual birds have been caught and banded, allowing Capture-Mark-Recapture (CMR) methods to be used to estimate survival rates. Our best estimate of annual adult survival is 85%. Fecundity has been estimated by finding over 70 nests during the past two years, using radio-telemetry. Birds are caught early in the nesting season, fitted with radio transmitters, and released. Their subsequent movement patterns allow us to locate nests and assess nesting success. About 28% of potentially nesting birds were estimated to be successful in fledging a chick. A surprisingly large number of birds caught made no attempt to nest, suggesting a considerable non-breeding population. Many nests were in inaccessible locations, often on steep slopes at high altitudes (500-1200 m). All nests located were in trees >100 years of age, but such sites were rare at low altitudes because of considerable logging early in the century. Birds were captured in mist-nets mainly from late June to mid-August and are

thought to be mainly birds feeding young or prospecting for nest sites. That sample was strongly biased towards males. Birds were caught by night-lighting over a longer period of time, in equal sex-ratio, and comprised adults at all stages of the breeding season and also newly hatched juveniles. Two juveniles recaptured in the area one year later suggested some degree of natal philopatry.

Municipal planning and bird conservation. *Couturier, Andrew* (Bird Studies Canada, Port Rowan, Ont.)

In Ontario, municipalities and other planning authorities are faced with the complex task of coordinating development activities without impairing the values and functions of natural heritage features, including those associated with significant wildlife habitat and significant woodlands. This paper describes an approach for targeting conservation efforts by identifying bird species (and associated habitats) that are significant within municipal planning units. Ranked lists of bird species are developed based on: breeding distribution, abundance, population trend, productivity, and area sensitivity. In addition to vulnerable, threatened, and endangered species, the method targets species which, although currently not in crisis, warrant consideration in land-use planning and development activities. Regionally specific lists of priority birds represent tools that planning authorities might use for: developing/revising Official Plans, evaluating development proposals, bio-regional planning, cumulative effects assessment, and identification of significant heritage features. Applications of the approach are illustrated with case studies from southern Ontario.

Regional conservation related to seasonal biodiversity and rarity. *Cyr, André* (Dep. Biol., Univ. Sherbrooke, Sherbrooke, Qué.) and *Jacques Larivée* (CÉGEP, Rimouski, Qué.)

Biodiversity has been considered for conservation purposes mainly with reference to breeding birds. The new atlas of breeding birds of Great Britain mapped drastically different conservation alternatives using all-species richness vs. number of red data birds per area. By a similar approach, we mapped species richness of birds in Québec at different seasons from the EPOQ database, as well as numbers of unusual species and of species with limited distribution. Comparing these maps, areas deserving conservation stood out at other seasons as well as for breeding birds, and for particular groups of birds as well as for all-species richness. New conservation efforts should consider the potential value of distributions of special groups of birds in decision-making for habitat protection.

Conservation of at-risk bird species by the Canadian Important Bird Areas (IBA) program. *de Forest, Leah* (Can. Nat. Fed., Ottawa, Ont.)

The Canadian Important Bird Areas (IBA) program seeks to identify and conserve a network of sites critical to the long-term health of Canadian bird populations, including sites that hold significant populations of endangered, threatened, and vulnerable Canadian birds. Canadian Nature Federation and Bird Studies Canada are national co-partners in this global BirdLife International program. Conservation of IBAs is site-based, forming part of an integrated approach to bird conservation. High-priority IBAs are being selected by provincial advisory committees, and IBA community conservation planners are developing and assisting in implementation of conservation plans for these sites with direct involvement of local communities and other stakeholders. The process is inclusive, cooperative, and locally driven, yet takes national and international bird conservation initiatives into account. An update on IBA conservation planning at sites containing at-risk species will be presented, highlighting progress and approaches taken.

Saving the birds - twelve years on. *Diamond, Antony W.* (ACWERN, Univ. N.B., Fredericton, N.B.)

In 1987 BirdLife International (then called International Council for Bird Preservation) published "Save the Birds" (released in 14 countries & 9 languages), relating bird conservation problems to the major ecosystems of the world. The book included detailed treatments of 50 of the world's most endangered species. Here I compare status of those species then and now, and ask the question, "Have modern conservation efforts focused on those species been effective in improving their status?" This paper provides a global perspective to bird conservation problems and solutions, to complement contributions focused on Canadian species.

An indirect estimate of mass loss between capture and weighing. *Dunn, Erica* (Can. Wildl. Serv., Hull, Qué.) [POSTER PAPER]

Mass loss between capture and weighing was estimated from multiple regression analysis of nearly 183,000 weights of 48 species of small birds banded during migration. In effect, the analysis compared mass of birds weighed immediately after capture to mass of birds captured at the same time but not weighed until later. No individual had to be captured or weighed more than once. Significant mass loss occurred in 36 of the 48 species, at a median rate of 1.18% of lean body mass/h, a rate of loss considerably less than from direct measures involving repeated weighing of the same individuals. Excretion and water loss comprised most of the decline in mass, but banders should take extra steps to minimize holding time in arid regions, in hot weather, and and when feeding conditions are poor.

Trends in numbers of land bird migrants at Long Point Bird Observatory, 1961-1998. *Francis, Charles M.* (Bird Studies Canada. Port Rowan, Ont.) and *David J.T. Hussell* (Min. Nat. Res., Peterborough, Ont.) [POSTER PAPER]

Numbers of land bird migrants stopping at 3 sites on Long Point, Ontario, were estimated daily during spring and fall migrations, 1961-1998. Annual indices of abundance for each of 64 species were estimated separately for each season using a multiple regression model, controlling for effects of weather, lunar cycle, date, and site-specific effects. Trajectories of the annual indices were modeled and trends estimated over selected time periods using up to 7th-order polynomials. We summarize changes from previous analyses with the addition of 1998 data, and present graphs of population trajectories and summary statistics for various species. Many species showed net decreases through 1988, but the majority increased subsequently and now show a net positive trend since 1961. Our trend estimates are correlated with estimates from the Breeding Bird Survey (BBS) in Ontario, but tend to be higher (more positive) than estimates from the BBS. We identify species showing major increases, decreases, and fluctuations, and discuss the significance of these changes. We draw attention to 9 species showing long-term declines that may be of conservation concern.

Site fidelity in Tree Swallows. *Francis, Charles M.* (Bird Studies Canada. Port Rowan, Ont.) and *David J.T. Hussell* (Min. Nat. Res., Peterborough, Ont.) [POSTER PAPER]

Although it is well-known that many species of cavity-nesting birds, including Tree Swallows (*Tachycineta bicolor*), often return to the same or nearby nest-boxes in subsequent years, little quantitative information is available on the proportion of birds that are site-faithful. At Long Point Bird Observatory, grids of nest-boxes at up to 3 locations each year have been monitored regularly, and the precise location of each box recorded. From 1970 to 1998, about 16,500 nestling and 3,000 adult Tree Swallows were banded in these nest boxes, yielding about 4,000 recaptures in subsequent years. We examined among-year site-fidelity at three scales. First, we estimated the proportion of birds that returned to the same box where they had previously bred. Second, for birds that changed boxes but remained within a study grid, we tested whether they selected boxes that were closer to their original box than might be expected based on availability of boxes. Third, we estimated the proportion of birds that moved among study grids, and whether this was influenced by distance between grids (which were from 4 to 34 km apart). Where appropriate, analyses were based on capture-recapture methods to correct for the fact that some birds were not captured every year. We also tested whether these measures of site-fidelity were influenced by the bird's age, sex, or breeding success in the previous year.

Factors affecting Piping Plover productivity at Lake Diefenbaker, Saskatchewan. *Goossen, J. Paul* (Can. Wildl. Serv., Edmonton, Alta.) and *Thomas S. Jung* (Nature Sask., Regina, Sask.)

We investigated the factors affecting reproductive success of Piping Plovers (*Charadrius melodus*) at a reservoir in south-central Saskatchewan. We documented clutch fate and chick survival from 104 nests and compared them to habitat and water-level data during 1997-98. In both years, productivity was well below the suggested population stability level of 1.13 chicks fledged/pair (0.32 c.f./pr in 1997, 0.09 c.f./pr in 1998). Hatching success was low in both years (41.5% and 48.3% in 1997 and 1998, respectively. However, the cause of low hatching success differed between years. Flooding was the primary cause of nest failures in 1997, whereas in 1998 predation accounted for largest proportion of nest failures. In both years, little of the original habitat remained for brood-rearing by mean fledge date (>18%). We attribute these differences to differential timing of water-level rises in the two years ($P<0.001$). Few chicks survived to fledging in both years (<20%). We developed predictive statistical models of habitat factors influencing nest predation, and used a simulation model (with 3,500 simulated nests) to explore how adjustments in water-level operations might be used to enhance Piping Plover productivity. Our approach provides a basis for developing effective long-term conservation plans for Piping Plovers at this important breeding site.

Translocating Piping Plover clutches threatened by flooding. *Goossen, J. Paul* (Can. Wildl. Serv., Edmonton, Alta.), *Thomas S. Jung*, and *Isabelle-Anne Bisson* (Nature Sask., Regina, Sask.) [POSTER PAPER]

At Lake Diefenbaker, Saskatchewan, Piping Plover (*Charadrius melodus*) reproductive efforts are often threatened by rising waters, which originate primarily from snow-melt in the Rocky Mountains. Increasing water-levels at this large reservoir can flood nests and reduce or eliminate brood-rearing habitat. A technique, using artificial nests, was developed to aid moving clutches to higher ground. During 1997 and 1998, 13 clutches were moved. All pairs accepted the artificial nest and nearly all translocation efforts. Few nests hatched, however, owing to rising water. As a management tool, clutch translocations will only be of value if eggs can be moved far enough to avoid flooding and if brood-rearing habitat remains available.

A GIS approach to evaluate Loggerhead Shrike habitat availability in southern Québec, Canada. *Grenier, Marcelle, Benoît Jobin*, and *Pierre Laporte* (Serv. can. faune, Ste-Foy, Qué.) [POSTER PAPER]

At the turn of the century, the Loggerhead Shrike (*Lanius*

ludovicianus migrans) was well-established in the rural landscape of eastern Canada along the St. Lawrence valley. However, population estimates showed decreasing trends from the late 1940s, so drastic that the species is listed among Québec's endangered species since the late 1980s. In 1992, only 2 breeding pairs were reported in Québec, and the last shrike nest was recorded in 1993. In 1993, a national recovery program was undertaken to rehabilitate Loggerhead Shrike populations. In 1999, we started a project to assess availability of suitable breeding habitats in Québec. From known nesting sites in Ontario and analysis of Landsat-TM images, we developed regional landscape criteria in 100 km^2 plots and patch indices criteria at the pasture level to evaluate pasture suitability for breeding Loggerhead Shrikes. These results were applied to images covering a portion of the St. Lawrence valley in southern Québec to evaluate availability of remaining shrike breeding habitat in this province as part of a possible reintroduction program.

Near-extirpation: how we almost lost the Upland Sandpiper. *Houston, C. Stuart* (Univ. Sask., Saskatoon, Sask.)

The Upland Sandpiper (*Bartramia longicauda*), once one of the commonest grassland birds in southern Manitoba and Saskatchewan, declined drastically and rapidly at the turn of the century as settlers arrived and grass succumbed to the plough. In the northern United States and in Argentina, 1870-1900, it replaced the Eskimo Curlew (*Numenius borealis*) and Passenger Pigeon (*Ectopistes migratorius*) as a prime market delicacy, and came close to following those two species into extinction. Although adults and their unusually large eggs provided food for hungry settlers, from May through August, habitat loss, not hunting, was the major factor contributing to their decline in Canada. Lowest numbers probably occurred in the 1920s. Continuing habitat loss, and whatever other factors are contributing to the decline of other grassland species, together explain the Breeding Bird Survey downward trend of over 2% per year in Canada, 1966-1994. Anecdotal historical data from many sources allow a fairly comprehensive but non-numerical appreciation of their pre-agriculture abundance.

Colonization followed by extirpation: the Greater Prairie-Chicken on the northern Great Plains. *Houston, C. Stuart* (Univ. Sask., Saskatoon, Sask.)

In western Canada, the Greater Prairie-Chicken (*Tympanuchus cupido*) has come and gone, but few details of this saga have been published. Following closely on agricultural settlement, thriving on grain as an alternate food, the 'Pinnated Grouse' reached Winnipeg in 1881 and Carberry, Manitoba, in 1886; Saltcoats, Saskatchewan, in 1897; and Red Deer, Alberta, in 1914. It spread as far northwest as Lac la Biche, Alberta. Once half the land in a given area was broken, this species diminished in numbers, retreating to local areas of thick grass around sloughs and lakes. By the late 1930s, almost all were gone. Habitat factors such as fragmentation and separation of grasslands were further accentuated by cattle overgrazing, burning, and drought, and then by hybridization of surviving isolated birds. By accessing unpublished records for the Prairie Provinces, and by cataloguing 116 northern Great Plains egg sets from 46 North American collections, I was able to fill some of the gaps in knowledge, including unpublished sightings from northwestern Ontario.

Seasonal variation in body mass of Marbled Murrelets in British Columbia, Canada. *Hull, Cindy L., Brett Vanderkist, Lynn Lougheed*, and *Fred Cooke* (Dep. Biol. Sci., Simon Fraser Univ., Burnaby, B.C.)

Body mass variation was measured in Marbled Murrelets (*Brachyramphus marmoratus*) May-August 1994-97, at Desolation Sound, and Mussel Inlet (1997 only), British Columbia. Birds were captured using a floating mist-net system during all years, and by night-lighting in 1997. Birds were weighed, and then sexed using a molecular sexing technique. A total of 426 adults was captured (273 males, 153 females) and 28 recently fledged juveniles (1997 only). Males (201.8 $\pm$ 14.3 g) were significantly heavier than females (195.1 $\pm$ 13.7 g), females averaging 96.7% of male mass. Juvenile males were 160.9 $\pm$ 23.8 g and females 151.5 $\pm$ 26.1 g, thus 80% and 78% of adult male and female masses, respectively. Using date as a covariate, no significant differences were found in adult mass across years of the study within each sex. The mass of females declined across the breeding season, but male mass did not. The decline in female mass was observed only in birds caught in the morning, and in birds caught by night-lighting. This decline in mass is most likely related to laying of the one large egg and associated changes in mass of organs. It appeared that the two capture techniques sampled different parts of the population at Desolation Sound, with night-lighting sampling more breeding birds. There was no evidence of programmed mass loss in this species, although this has been suggested as an ancestral trait in the alcids.

Towards a better understanding of the status of imperilled birds in Canada. *Hyslop, Colleen* (Can. Wildl. Serv., Ottawa, Ont.) and *Michel Gosselin* (Can. Mus. Nature, Ottawa, Ont.)

COSEWIC is the official body for the designation of imperilled species in Canada, and status reports constitute the basis for such designations. Because status reports are prepared almost exclusively after suggestions of committee members, there is a need for a summarized overview of the trends and threats affecting all Canadian bird species in order to focus the commissioning of status reports on the most appropriate species. One difficulty in creating such a summary comes from the definition of "species" by COSEWIC (i.e. species,

subspecies, or isolated population of "national significance"). About 25% of the imperilled bird "species" now recognized by COSEWIC are in fact taxa below the species level. So far, the taxonomic units that have been subject to designations have been decided on an ad hoc basis, often during or after report preparation (Yellow-breasted Chat, for example, is split in three separate units). In order to ensure the credibility of the whole exercise, we believe it is necessary to identify a priori the taxa that will be looked at, should their status warrant it. We present an attempt to arrive at a clearer definition, and hence a list, of the taxa to be examined, based upon both the geographic isolation and the phenetic (and presumed genetic) differentiation of the various bird populations.

Marbled Murrelet conservation: making effective decisions with a poorly understood species. *Kaiser, Gary W.* and *Lynn Lougheed* (Can. Wildl. Serv., Delta, B.C.)

Since 1988 the Marbled Murrelet (*Brachyramphus marmoratus*) has been the subject of a large number of research and survey projects along the whole Pacific Coast, costing millions of dollars annually. The main thrust of this effort has been to determine the characteristics of preferred nesting habitat. There have been two main approaches: surveys and behavioral studies (mostly in the United States), and banding studies for radio-telemetry (mostly Canadian), which have also allowed attempts at demographic analysis, endocrinology, genetics, and behavioral ecology. From the start, radio-telemetry was recognized as a less-biased approach to the determination of nesting habitat preference, because birds are captured on the water more or less randomly. However, most jurisdictions have used tree-by-tree searches to determine nest locations, which is laborious, often unproductive, and prone to subjective bias. Unfortunately, weak knowledge of the birds led to strategic errors which slowed the development of telemetry as a tool. In addition, the success of mist-netting operations obscured unexpected gender and seasonal biases. In 1998 and 1999, active pursuit of birds loafing on the water at night provided a new approach, which paid off immediately by leading to location of more than 65 nests scattered through undisturbed habitats and doubling the number of known nests for this species. Broader application of this technique and its linkage to forest-cover maps will facilitate landscape-scale decision-making in many parts of British Columbia.

First incubation, rearing and release of a Marbled Murrelet (*Brachyramphus marmoratus*). *Lank, David B.* (Dep. Biol. Sci., Simon Fraser Univ., Burnaby, B.C.)

Two Marbled Murrelet eggs collected inadvertently when females were captured as part of a radio-telemetry project aimed at finding nest-sites in the Bunster Range on Desolation Sound, B.C., were incubated. Both eggs pipped after 28 days incubation at 37.5°C and 67% humidity. One chick was reversed in the egg, perhaps as a result of transport between the field-site and the lab, and failed to hatch. The other hatched after 30 days incubation, grew normally, was transported back to the field-site, and released into the wild at fledging. After hatch, the bird was left in a hatcher for 24 h, and then moved to a dark warm box at ca.32°C for one day. Thereafter the bird appeared comfortable at room temperature. The chick was remarkably easy to feed and maintain. For the first 24 days of life, it was fed sandlance, a 1-2g ocean fish captured and frozen at the field-site, which makes up a large component of the bird's natural diet at that site. We fed it during 2-4 ad libitum sessions per day. Begging behaviour was limited to shivering-like body movements, and a quiet trill when more hungry. It ate from ca.10g/d as a 33g bird after hatch to a plateau of ca.50g/d from day 14 through fledging. The chick's growth-curve paralleled those published for two wild chicks from Alaskan populations. During the growth phase, the bird remained remarkably still, sitting on astroturf carpeting in a shallow bowl kept within a cardboard box. As reported from the wild, the bird maintained its downy exterior appearance while growing contour feathers underneath. Prior to fledging, it stripped the down off the ends of its feathers. Our success demonstrates that captive rearing of this threatened species can be relatively straightforward.

Basal area preference of VTE and other forest songbirds in a managed forest in southwestern Ontario. *McCracken, Jon D., Charles M. Francis*, and *Becky M. Whittam* (Bird Studies Canada, Port Rowan, Ont.)

For each of 9 target species (Acadian Flycatcher, Cerulean Warbler, Hooded Warbler, American Redstart, Ovenbird, Red-eyed Vireo, Scarlet Tanager, Veery, Wood Thrush), we compared habitat around nest-sites with habitat at systematically selected control sites located throughout a large, managed forest block in southwestern Ontario. For all species, one or more of the following variables differed significantly (either positively or negatively) from control points: habitat heterogeneity, ground cover, density of shrub/sapling layer, canopy cover, tree species diversity, tree densities, tree basal areas. For most species, total basal area of trees was not a good predictor of nest sites, but breakdown of basal area provided an important predictor; nest-sites were more strongly dominated by larger trees than control sites. We concluded that expressions of total basal area alone do not provide enough information for the effective management of VTE (vulnerable-threatened-endangered) forest birds, and it is necessary to have prescriptions, forestry assessments, and habitat models that break total basal area down into its component size-classes. Retention of many species of forest-interior birds, including VTE birds, will rely upon retaining an adequate number of

large trees in the forest stand. Hence, of the variety of cutting prescriptions available to forest managers in southwestern Ontario, the increasingly popular practice of "diameter-limit cutting" (high-grading) will likely have the most serious negative impacts on VTE forest birds like Acadian Flycatcher, Cerulean Warbler and Hooded Warbler, as this practice removes all or most of the trees in the larger size-classes.

Improving avian recovery in Canada: a role for researchers. *Nadeau, Simon, and Kent Prior* (Can. Wildl. Serv., Ottawa, Ont.)

Nineteen of 25 endangered and threatened birds in Canada are objects of recovery efforts. The broad public appeal of birds, the wealth of available ornithological research information and capacity, and federal obligations to conserve migratory birds are among the reasons why Canadian birds at risk receive relatively high attention compared to other taxa. However, the new Accord for the Protection of Species at Risk in Canada requires that all endangered and threatened species receive attention. Thus, avian conservation will have to become more efficient and priority-driven. Among other things, this will require that recovery planning for multiple species and ecosystems become more common and that species whose geographic ranges fall largely within Canada receive preferential attention. This paper illustrates examples of such applied research under specific bird recovery initiatives, and outlines opportunities in the evolving National Wildlife Recovery Program.

Distribution patterns of birds associated with snags in different boreal forest landscapes. *Nappi, A., P. Drapeau, J.-F. Giroux*, and *A. Leduc* (Groupe res. écol. for. interuniv. (GREFi), Dep. sci. biol., Univ. de Québec à Montréal, Qué.) [POSTER PAPER]

In boreal forests, several bird species use snags for feeding or nesting and depend on them for their survival. Some studies have shown that availability of snags is greatly influenced by age of the forest and type of perturbations (natural vs. anthropogenic). In North American boreal forests, relationships between birds and dead wood availability have been documented predominantly in western forests. The dynamics of dead wood and distribution patterns of birds associated with this habitat feature remain largely unknown in eastern black spruce forests. We documented distribution patterns of birds associated with dead wood in natural forest landscapes that were disturbed by different fire events (<2 yr, 20 yr, 95 yr, >200 yr). We then examined the effect of forest management on this avian guild by comparing bird patterns and dead wood availability between natural and managed forest landscapes of equivalent ages (20 yr, 80-95 yr). Birds were surveyed in 348 point-counts in the 6 different forest landscapes. Standing dead trees and coarse woody debris were sampled with vegetation plots centred at each point-count. Mature forest mosaic showed a greater species richness and abundance of cavity-nesting birds than the other forest mosaics. Results also indicated that recently burned forests are especially important for woodpeckers, given the greater availability of dead trees. Single-species models showed species-specific responses to abundance and quality of snags. Black-backed Woodpecker (*Picoides arcticus*) was the species that responded most to availability of dead wood; it was mainly restricted to the recently burned forest mosaic. Management implications of these findings for this avian guild are also discussed.

Distribution, feeding and nesting ecology of the Black-backed Woodpecker in the eastern boreal spruce forest. *Nappi, Antoine, Pierre Drapeau, Jean-François Giroux* (GREFi, Dep. Sci. Biol., Univ. Québec à Montréal, Qué.), and *Jean-Pierre Savard* (Serv. can. faune, Ste-Foy, Qué.)

The Black-backed Woodpecker (*Picoides arcticus*) is a Nearctic species associated with coarse woody debris in boreal forests. Rare throughout its range, recent studies have shown it can reach high densities in areas disturbed by fire and insect outbreaks. In eastern boreal forests its distribution and ecology are poorly documented. This study aimed (i) to quantify the species' distribution in forest landscapes disturbed by different fire events (1 yr, 20 yr, 95 yr, >200 yr), and (ii) determine snag use for feeding and nesting. Point-counts and playbacks were used to census the species across an age-gradient of black spruce forests in NW Québec. Intensive nest-search and field observations of individual birds feeding on snags were conducted in the recently burned forest mosaic. Feeding activities (small holes, bark flaking) were recorded in plots of 700m^2. Trees used by birds were compared with non-used snags. Twenty-five active nests were found. Habitat variables were measured around nest-sites, at non-used sites (within territories) and at random sites (outside territories). Results indicated that (i) the species is clearly restricted to recently burned forests, (ii) within this habitat, snags used for feeding were larger and less decayed than non-used snags, and (iii) availability of large snags (DBH>15cm) was the most important variable in selection of nesting sites. Our results suggest that intensification of salvage logging in recently burned forests may become a serious threat to maintenance of viable Black-backed Woodpecker populations. This occurs while Quebec's Ministry of Natural Resources (QMNR) is subscribing to Canadian Council of Forest Ministers "Criteria and indicators of sustainable forest management" that include maintenance of biodiversity. Under QMNR's present regulation, forest industries are constrained to undertake intensive salvage logging in recently burned areas of their forest management unit. This is done without consideration of

potential impacts of such a practice on maintenance of biodiversity.

On the function of male-female chases in the Red-winged Blackbird. *Pribil, Stanislav* (Dep. Biol., Univ. Miami, Miami, Fla., U.S.A.) [POSTER PAPER]

A conspicious feature of Red-winged Blackbird (*Agelaius phoeniceus*) social behaviour is male-female chases. During the chases, one to several males fly at top speed as they pursue a female across a marsh. These have been called "sexual chases" in the literature, but they seldom result in mating between the female and her pursuer(s). To elucidate the function of such chases, I recorded detailed information on 54 chases in an eastern population of the Red-winged Blackbird. Most (80%) of the observed chases involved a single male pursuing a female, although chases involving up to 7 males were also seen. Based on the identity of the individuals, their nesting stage and the context in which the chases occurred, I classified their putative function in five categories: (i) 56% involved a male evicting a non-resident from his territory, presumably to prevent her from foraging there; (ii) 19% involved a male trespassing on another male's territory and harassing the resident female there; (iii) 19% occurred when a male interfered with his mate's attempt to evict a new female from the territory; (iv) 9% involved a male chasing his mate away from the territory of a neighbour, presumably to prevent her seeking extra-pair copulations there; (v) 7% of chases had other functions. These results suggest that the single most important function of the chases is to prevent non-resident females from foraging on a territory. Consequently, the term "sexual chases" should not be used to describe male-female chases in this species.

Satellite tracking of Barrow's Goldeneye in eastern North America: first breeding evidence and location of moulting sites. *Robert, Michel, Jean-Pierre L. Savard* (Serv. can. faune, Ste-Foy, Qué.), *Guy Fitzgerald* (Union qué. rehab. ois. de proie, St-Hyacinthe, Qué.), and *Pierre Laporte* (SCF, Ste-Foy) [POSTER PAPER]

A few thousand Barrow's Goldeneyes (BAGO; *Bucephala islandica*) winter in northeastern North America, particularly along the St. Lawrence River, Qué., and a breeding population has long been suspected in Labrador and/or interior Québec. In February and April 1998, we captured seven BAGO drakes along the St. Lawrence estuary and implanted them with Argos PTT-100 satellite transmitters; this involves general anesthesia and aseptic surgical techniques to place the transmitter in the abdominal cavity with the antenna exiting dorso-caudally. Beginning in the last week of April, five males moved 60-140 km inland along the north shore of the St. Lawrence estuary and gulf, where they spent an average 44 ± 2.9 d (range 34-50 d), presumably with their mates. Subsequent ground surveys in these areas allowed us to document breeding for the first time in eastern North America. All paired males (n=5) departed from their breeding areas 29 May-28 June and flew an average of 948 ± 130 km (range 800-1120 km) northward to reach moulting grounds. Two moulted in Hudson Bay, two in Ungava Bay, and one on the northern coast of Labrador. Another male, probably a non-breeder, stayed along the St. Lawrence corridor until 5 June and then flew 1080 km to Ungava Bay, presumably to moult. Movements toward moulting sites were direct and usually quite rapid, and birds remained in moulting areas throughout the summer. Two males were tracked until they flew back to their wintering grounds; one reached the St. Lawrence estuary 26 October, covering 1200 km in less than two days, and the other reached the St. Lawrence between 14 and 28 November. Our study indicates that male BAGO have well-developed moult migrations in eastern North America, and raises interesting questions about how moulting sites are selected.

Estimating breeding densities of Bicknell's and Swainson's Thrushes in southern Québec. *Rompré, Ghislain, Véronique Connolly, Gilles Seutin* (Dept. Geogr., McGill Univ., Montréal, Qué.), *Jean-Pierre Savard*, and *Yves Aubry* (Serv. can. faune, Ste-Foy, Qué.) [POSTER PAPER]

Few data exist on population densities for Bicknell's Thrush (*Catharus bicknelli*) and Swainson's Thrush (*C. ustulatus*) in Québec. Previous data, based on spot-mapping in small (4 ha) plots visited 5 or 6 times, provided relatively low density estimates for both species (0.25-0.75 pr/ha). Our study, conducted in the mountains of the Eastern Townships (SE Québec), using plots of 5-10 ha which were visited 8 or 9 times each, showed greater densities (up to 1.52 and 1.62 pr/ha) than the previous studies. These estimates are close to those obtained in New England using similar methods. Density estimates obtained through point-counts in the same areas revealed densities of 0.87 and 1.56 pr/ha for the two species. Recent observations indicate that Bicknell's Thrush might have an unorthodox mating system. It is unclear whether or not this implies that our density estimates are in error.

Bird recovery in Australia. *Russell, Vicki-Jo* (Conservation Centre, Adelaide, So. Australia)

Australia has a rich avifauna with an estimated 650 resident species (45% endemic) and regular visitors, and another 300 species recorded as rare vagrants. Since European settlement in Australia in early 1800s, the fauna has been under increasing pressure from habitat loss and modification, introduced species such as the red fox and a combination of other direct or indirect human impacts. About 12% of Australia's avifauna is considered threatened and many other bird species and particular populations are thought to be in decline. Recovery of

threatened birds in Australia is spearheaded by the Recovery Plan process established in the nation's Endangered Species Protection Act 1992. State and municipal governments have also initiated programs within their jurisdictions. Underpinning the recovery effort though are the contributions of naturalists' clubs and the broader Australian community. Community surveys and environmental monitoring projects, rural outreach programs, habitat revegetation and restoration projects, land acquisition of important bird areas and the establishment of a comprehensive inventory on the birds of Australasia are just some of these contributions. This presentation will give its audience a whirlwind tour of some of Australia's most threatened birds and their habitats, including orange-bellied parrot, malleefowl, black-eared miner, and Mt. Lofty Ranges southern emu-wren, and will outline some of the diverse efforts of Australians to save their birds.

Priorization: a potentially dangerous exercise. *Jean-Pierre Savard* (Serv. can. faune, Ste-Foy, Qué.)

Priorization exercises have become a common feature in wildlife and habitat conservation. They are quite similar to modeling exercises which vary greatly in terms of performance, links with reality, and power. It is a common practice now to evaluate models critically, but unfortunately this is not yet the case with priorization exercises, which are seldom evaluated. Indiscriminate and improper use of priorization exercises can have insidious short-and long-term effects (i.e. lack of pro-active actions within a conservation agency). Common mistakes in priorization exercises include: (i) lack of evaluation of biological relevance of the model used and its rankings; (ii) lack of data for the criteria used; (iii) improper weights given to criteria; (iv) no justifications given for weights given to criteria; (v) utilization of too many criteria; (vi) priorization of items that should not be priorized together; (vii) priorization at different scales; (viii) use of databases of poor or unknown reliability; (ix) improper use of a given ranking. Priorization schemes using a matricial approach (i.e. Partners in Flight bird priorization, Nature Conservancy priorization) are quite vulnerable to these errors. Hierarchical priorization techniques are much superior and should be preferred or used conjointly with matricial approaches. Priorization should be one of many tools used to orient actions, not a constraining structure directing them.

Range data from bird field guides: a note of caution regarding their use in a conservation context. *Seutin, Gilles, and Christian Dyer* (Dep. Geogr., McGill Univ., Montréal, Qué.)

Range information is used in several ways in conservation biology. The extent of a species' range is often used to quantify responsibility of a jurisdiction in its protection; the larger the proportion of a species' global range within a jurisdiction, the greater the responsibility of that jurisdiction for its conservation. Range size is also used to identify the rarity and presumably the risk of extirpation of a taxon; restricted-range species are given higher conservation priority than widespread species. Finally, distribution data on rare or indicator species are often used to identify biomes, ecoregions or other areas in need of protection. For all this, accurate range information is needed. We digitized distribution maps of 20 Canadian bird species (selected at random) shown in four widely used field guides. Range sizes were generally consistent among sources (discrepancies <30%), but differences greater than 50% were noted for some narrowly distributed species. This could lead to erroneous conservation ranks being given to these taxa, unless a gross scale of range occurrence is used. Accuracy of range-mapping was verified by overlaying maps from the four sources. Pairwise overlaps varied among species, but were generally greater than 70%. Overlap of less than 50% was noted for some narrowly distributed taxa. Conservation managers should be careful in selecting range information for priorization exercises.

Habitat preferences and activity budgets of Dunlins (*Calidris alpina pacifica*) wintering in the Fraser River delta, and the influence of predation risk. *Philippa C.F. Shepherd, David B. Lank* (Dep. Biol. Sci., Simon Fraser Univ., Burnaby, B.C.), and *Bob Vernon* (Agric. Canada, Agassiz, B.C.)

We examined winter habitat preferences and activity budgets of Dunlins in the Fraser River Delta, the largest river-outlet on Canada's Pacific coast. The Fraser Delta, adjoining the rapidly expanding city of Vancouver, B.C., hosts the country's highest winter densities of waterbirds, shorebirds, and raptors, as well as some of its most productive agricultural lands. We used radio-telemetry and behavioural observations to monitor locations and activity of individual Dunlins of known sex (and where possible age) at high and low tides, both by day and by night, under a variety of environmental conditions. We analysed 2nd and 3rd order habitat selection, and as expected Dunlins preferred mudflats, but they also foraged and roosted in the nearby agricultural habitats, primarily at night. Dunlins occasionally used the agricultural habitat during the day and, when they did, their flock size was smaller, they were more vigilant, and they fed less than on the mudflats. This may be due to day and night differences in predation risk between the two areas. Most of the agricultural habitats are surrounded by hedgerows and trees, so it is easier for aerial predators to surprise them on the ground there than on the mudflats. Dunlins moved less at night than during the day. This may in part be because during the day they gathered into large flocks and spent a significant amount of time in the air when tide was high (68.2 min $\pm$ 12.3 min SE) even though plenty of adjacent