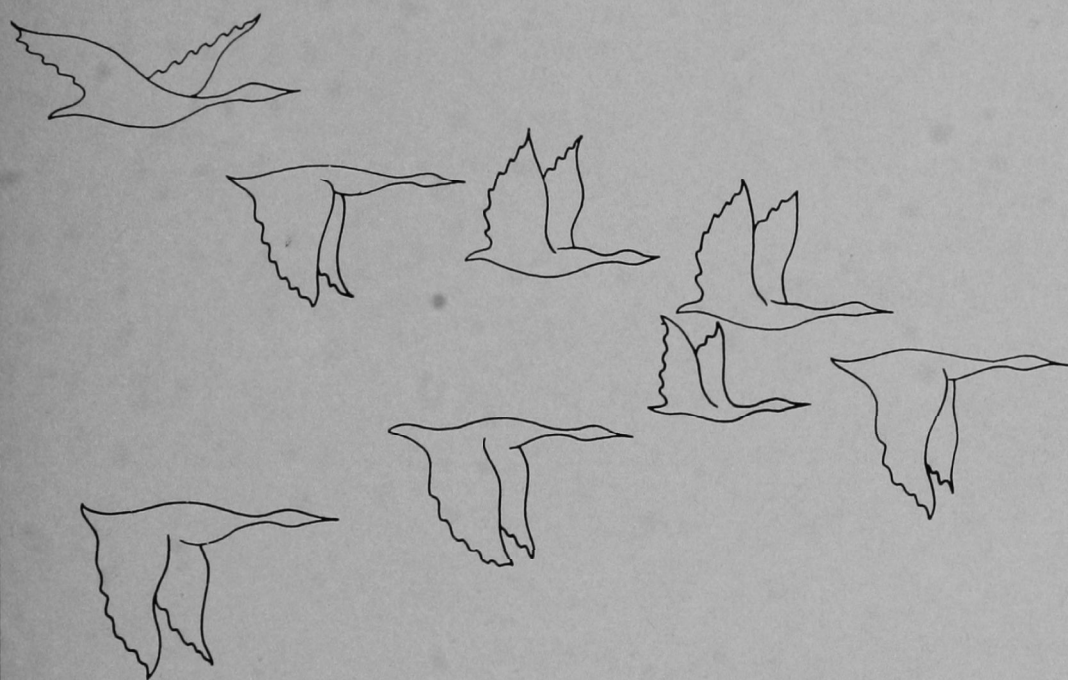


Jean Cinq-MARS.

Annual Review
1984-1985



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Canadian Wildlife Service
Canada

CANADIAN WILDLIFE SERVICE

The Canadian Wildlife Service (CWS) is part of Environment Canada, a federal department, and is responsible for the protection and management of migratory birds through development of regulations, habitat management, and supporting research and surveys. With the provinces and territories, the Service undertakes programs of research and management related to other wildlife where there is a national interest and advises other federal agencies on wildlife matters. CWS participates in international agreements and programs on wildlife conservation.

Owing to budget reductions imposed in November 1984, the interpretation program, land acquisitions, pathology and parasitology, bioelectronics and wildlife research carried out for Parks Canada were terminated as Canadian Wildlife Service programs.

Administratively, CWS is organized into a Headquarters Office in Hull, Québec, and five regional offices: Atlantic (Sackville, New Brunswick); Québec (Ste-Foy); Ontario (Ottawa); Western and Northern (Edmonton, Alberta); and Pacific and Yukon (Delta, British Columbia).

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**CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED
SPECIES OF WILD FAUNA AND FLORA (CITES)**

MIGRATORY BIRDS CONSERVATION PROGRAM

The Migratory Birds Conservation Program is the largest within CWS and encompasses a broad range of activities directed toward the conservation and management of migratory bird species.

This report documents some of the important initiatives and accomplishments during the 1984-85 year but does not attempt to provide a complete account of CWS activities within the program. Highlights of national programs are presented, followed by accounts of regional activities.

Headquarters

Harvest Management

Migratory Game Bird Hunting

In 1984-85 a total of 415,000 Migratory Game Bird Hunting Permits were sold. This continues the steady decline in permit sales since the peak in 1978, when 525,000 permits were sold. Much of the decrease took place in the prairie provinces.

The kill of ducks declined, as indicated by preliminary results from the national harvest surveys. Particularly in western Canada, where dry weather reduced both duck breeding success and hunting opportunity, there was a shift from duck to goose hunting.

Game bird banding is a vital component of CWS's programs of population research and management. In 1983, the most recent year for which counts are available, the Canadian bandings of Mallard were 38 388 birds, and of Black Ducks 8,111. There were also 308 Mallard-Black Duck hybrids banded. Some of the other major game bird species bandings included 4,116 Snow Geese, 10,113 Canada Geese and 1,668 Wood Duck.

Non-game Migratory Bird Program

There are about 100 000 non-game migratory birds banded in Canada every year. Many of these are banded by expert volunteers, to whom CWS is grateful. The non-game birds banded include such species as Least Flycatcher, Red-winged Blackbird, Evening Grosbeak, Common Redpoll, American Goldfinch, Snow Bunting, White-throated Sparrow, Black-capped Junco, Song Sparrow, Tree Swallow, Barn Swallow, Black-capped Chickadee, and various species of wood warblers and thrushes. Of particular interest is the growing number of Bluebirds banded at carefully operated Bluebird nest box projects.

CWS, with the U.S. Fish and Wildlife Service, coordinates the Breeding Bird Survey as part of the non-game bird program. In 1984, 220 volunteers across Canada gave up one or more days to provide results for this survey.

Regulations and Enforcement

In May 1984, the Canadian Wildlife Service gave early notice of proposed changes in regulatory activities through the publication of Environment Canada Regulatory Agendas. The listing of planned regulatory proposals also includes all major regulatory policy reviews and all planned or ongoing research activities that related to regulatory issues.

Two enforcement coordinators have been added to the staff, one in Newfoundland and the other in New Brunswick. These two appointments provide greater opportunity for liaison with the Royal Canadian Mounted Police and provincial and territorial enforcement personnel, and improved coordination of enforcement programs.

Protocol

The Protocol to amend the subsistence hunting provisions of the Migratory Birds Convention was signed by Canada and the United States in 1979. It has not been ratified yet by the United States, and so is not in effect. An additional agreement between the two countries to spell out details of how the Protocol will be implemented is now in preparation. We hope that a discussion paper on this agreement will be available for public comment in both countries during 1985. Once this additional agreement is complete, we expect that the United States will ratify the Protocol.

Habitat Protection

CWS began a process for rating and ranking habitats of importance to migratory birds. The revised rating scheme was developed for southern Canada and is currently being tested.

CWS continues to participate with Parks Canada in the preparation of a background paper on the conservation of lands in the Yukon and Northwest Territories. It is currently scheduled for release in 1985. CWS' contribution will concentrate on areas of importance to migratory birds.

The fourth year of the Wetland Mapping and Designation Program was marked by the completion of the mapping and rating of wetlands in Nova Scotia and P.E.I. and the initiation of the mapping of New Brunswick. In Ontario, the second edition of an evaluation scheme for southern Ontario wetlands was released. A publication on the statistical analysis of the data was completed.

Wildlife Habitat Canada

Wildlife Habitat Canada, an independent Foundation, became fully operational in the past year. The Board of Directors has been in place since September 1984, under the Chairmanship of Mr. Stewart Morrison. Mr. David Neave has been engaged as Executive Director of the Foundation. The federal government has provided a \$3 million administrative grant to the Foundation along with an annual commitment of funds generated from the sale of the Habitat Conservation Stamp. Beginning in the 1985 hunting season, migratory bird hunters will be required to purchase a \$4.00 Habitat Conservation Stamp to be affixed to their Migratory Game Bird Hunting Permit. The stamp as well as prints of the original art prepared by Mr. Robert Bateman will be available to all Canadians interested in supporting the Foundation's habitat conservation program.

North American Waterfowl Management Plan

The Canadian-American Steering Committee for the development of a North American Waterfowl Management Plan has met five times over the last seven months. Negotiations have progressed very well and a first draft of the Plan has been prepared for review by the Minister of Environment and Secretary of the Interior by the end of May 1985. Broad policies concerning waterfowl management established for Canada in the Canadian Position were upheld, and the Joint Steering Committee has unanimously endorsed the first draft of the North American Plan. This draft will be formally sent from the Minister and Secretary to the provinces, states, territories and flyway councils on 30 June 1985. Comments received from these management agencies will be incorporated into a draft to be released for public comment in September 1985.

Comprehensive Native Land Claims

The federal government is currently negotiating six comprehensive land claims settlements in Quebec, Labrador, British Columbia and the Northwest Territories. The COPE settlement, finalized in the summer of 1984, is being implemented and CWS continues to be involved in the implementation of the James Bay Agreement.

Negotiations in the Council for Yukon Indians claim, for which an Agreement-in-principle was reached in 1983, have been broken off, but could resume at any time. CWS, under the direction of the ADM ECS, is the lead departmental agency for all claims. Claims issues of special interest to DOE are native harvesting rights, environmental protection, conservation area establishment and native participation in renewable resource management.

Latin American Program

Now in its fifth year of operation, the Program is entering a consolidation phase as well as continuing previous activities and projects.

CWS, along with the US Fish and Wildlife Service and several of the major conservation organizations, contributed to the Latin American Wetland Evaluation. This two-year effort to list, classify and evaluate each country's major wetlands is being co-ordinated by the International Waterfowl Research Bureau. The results were presented at the first South American meeting of IWRB in February 1985. Other projects funded included the collection of Peregrine Falcon prey items in Panama and Costa Rica, shorebird surveys along the coast of Chile, and Common Tern studies in Peru. Letters of Arrangement have now been signed with Brasil, Venezuela, Ecuador, and Peru. A Letter of Arrangement with Chile is in progress.

Value of Wildlife Studies

A majority of provinces agreed to fund the preparation and publishing of three reports based on the Statistics Canada survey on the importance of wildlife to Canadians. The first report (A User's Guide to the Methodology of the 1981 National Survey) has been completed and should be published by the 1985 Federal-Provincial Wildlife Conference. The second report (Economic Significance of Wildlife-Related Recreational Activities) is scheduled to be released in July 1985. The third report (Corporate Profiles of Wildlife Management Constituencies) is scheduled to be released in March 1986. Earlier completion has been hampered by late receipt of necessary funding and reduced staff. Studies to determine the commercial and subsistence wildlife values in northern and remote regions of Canada have been abandoned as none of the provincial or territorial governments were able to commit the necessary funds for this initiative.

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Regional Activities

Atlantic Region

Co-ordination of enforcement of the Migratory Birds Regulations was continued. In New Brunswick, the recurring "spring shoot" was shortened by a late spring, which caused heavy ice on the Gulf of St. Lawrence, and the period of violations was reduced. Considerable media coverage resulted from enforcement presence in July at Machias Seal Island Migratory Bird Sanctuary, over which the USA also claims jurisdiction; one American charter boat captain disputes the application of Canadian Migratory Bird Regulations to his operations. A new position for enforcement co-ordinator in Newfoundland was staffed in November.

Resource inventories on National Wildlife Areas were made, except at Wallace Bay National Wildlife Area where failure of a highways department tidal barrier led to salt-water encroachment on one impoundment. The wetland inventory in New Brunswick was continued as air photos became available, and the wetland atlases and documentation for Nova Scotia and Prince Edward Island were finalized.

Monitoring of breeding waterfowl populations was continued on Prince Edward Island, using ground counts, and monitoring surveys were initiated in Nova Scotia by use of helicopter. Waterfowl banding continued, with substantial funding from the Atlantic Flyway Council's co-operative program, and over 4500 birds were banded in 1984. Research on breeding eider ducks at The Wolves (islands), N.B., revealed an unexpected connection with local availability of herring; in the absence of these fish, gulls wiped out all the eider ducklings hatched locally. Feeding studies on sea ducks in southern Newfoundland resulted in completion of an M.Sc. thesis at University of Western Ontario by Ian Goudie.

A draft of the revised and enlarged atlas of pelagic seabird distribution was completed, and following review it was revised for publication in 1985. Inventory of burrow-nesting seabirds (Leach's Storm-Petrel and Atlantic Puffin) were made for the first time on Baccalieu Island, and were updated at Gull Island and Wadham Islands, also in Newfoundland. Monitoring of breeding success of Common Murres and Atlantic Puffins, in connection with the commercial exploitation of the capelin stocks on which these birds depend, was continued at Great Island, Newfoundland, and Gannet Islands, Labrador. With DSS and DFO, CWS also supported a Memorial University contract to study seabird-capelin relationships in nearshore waters off Newfoundland. Specimen analysis and data processing continued toward publication of results from the alcid community study at Gannet Islands, Labrador. The manuscript of a book-length monograph on "The Atlantic Alcidae" was finalized and accepted for publication by Academic Press. Research continued on the interactions of gulls and terns on Sable Island, formerly one of the largest tern colonies in the northwest Atlantic. Investigations into levels of and factors affecting seabird mortality in east coast waters were continued.

All operations were substantially disrupted by a freeze on spending followed by staff and budget cuts imposed on the CWS. Although migratory birds resources were not cut directly, except for habitat acquisition funds, the need to spread the budget in order to deploy effectively the surplus personnel from the programs cut will inevitably affect this program. The adverse effects on morale of the cuts and the uncertainty of program resources resulting from them will continue to be felt for months or years to come.

Québec Region

Management of National Wildlife Areas

Cap Tourmente welcomed over 130,000 visitors and 515 people participated in the traditional controlled hunt.

A new, reasonably-priced, daily hunting program was initiated to make Snow goose hunting more accessible in the Cap Tourmente National Wildlife area. This program will be implemented by Autumn 1985.

Improvements to coastal marshes were continued for the second year, resulting in considerable enlargement and enhancement of Snow goose habitat.

Habitat Protection

Of the Four projects submitted to the Wildlife Habitat Quebec Foundation with the approval of the Canadian Wildlife Service, two were approved and funded to the amount of \$85,000.00. Six islands on the Saint Lawrence near Montreal were also protected, in cooperation with Nature Conservancy of Canada.

Crop Depredation

A project was undertaken to develop and test various scare techniques in order to reduce damage to crops caused by Greater Snow Geese during spring staging.

Waterfowl Management Plan

A Quebec Waterfowl Management Plan was prepared jointly with le ministère québécois du Loisir, de la Chasse et de la Pêche and was submitted for public comments last November; by February, 200 different recommendations were received. The final plan will reflect users' concerns and propose a series of actions aimed at improving the management of this resource by private organizations.

Québec Region

Atlas

The preparation of a Breeding Bird Atlas of Quebec, started in 1984, will continue over the next five years. One hundred and fifty eight amateur ornithologists and 44 ornithologists have already completed the inventory of 519 sections, 10 km² each. A document entitled "Nidification des oiseaux du Québec? Chronologie" was produced.

Research and Surveys

The census of 3 Gannet colonies in the Gulf of St. Lawrence showed an increase in population. The one on Bonaventure Island is quite healthy: productivity is good and the eggs show lower levels of contaminants than those found in the early 1970's.

The census of major Eider duck colonies in the estuary showed an increase in population. A collection of 18 different studies of this species will be published soon. A presentation on the ecology of common and Arctic terns from the Mingan Islands was given at Colonial Waterbird Group Conference held at Ithica.

Studies on the distribution of Greater Snow Geese in the Arctic Islands of Bathurst and Somerset were continued. Photographic census conducted in May along the St. Lawrence showed a total of 22,000 geese. Productivity rates of 37% were measured in October.

Research on the impact of geese on scirpus marshes at Cap Tourmente National Wildlife area showed that geese did not affect the annual regeneration of the plants. These results were presented at the 5th Snow Goose Congress held in Quebec City in October.

National Wing Bee

This year, the national wing bee was held at St. Foy, Quebec February 4 to 8. Fifty biologists and technicians participated, including 17 from other regions of Canada. In addition to employees from other regions attending, there were also representatives of Ducks Unlimited, ministère québécois du Loisir, de la Chasse et de la Pêche, the Ontario Ministry of Natural Resources, the Université du Québec à Montréal, la société de conservation de la baie de l'Isle Verte, and the RCMP (Ontario and Québec).

Regulations and Conservation

The Acts and Regulations section published two documents during the year: "Elevage des oiseaux migrateurs en captivité" and "La sauvagine au Québec: ressource et exploitation 1978-1982".

Ontario Region

The Management Plan for the Big Creek National Wildlife Area was finalized and approved. The Plan is now being implemented with Ducks Unlimited undertaking major management projects within the marsh. Management plans were also completed for Mohawk Island and Eleanor Island NWAs. A preliminary management plan for Prince Edward Point was circulated for public comment.

Bald Eagles from northwestern Ontario were again successfully hacked at Long Point. Results continue to be encouraging. Four alternatives for the management of Oshawa's Second Marsh were prepared and distributed to the agencies concerned with the future of the marsh.

The Ontario Ministry of Natural Resources continued to implement the wetland evaluation system developed by OMNR and CWS. The second edition of the evaluation manual was printed in French and English. CWS continued to participate with the World Wildlife Fund and the Nature Conservancy in the Carolinian Canada project in southwestern Ontario.

An agreement was signed between Canada and the Province of Ontario. This agreement will facilitate wildlife management work in Ontario. A draft text of the Ontario Waterfowl Management Plan has been prepared in co-operation with the Ontario Ministry of Natural Resources, and will be presented at public meetings throughout the province. This plan will form the basis for waterfowl management in Ontario until the year 2000.

Complaints about Ring-billed Gulls have continued to increase. Further studies were made at Leslie Street Spit, in co-operation with the Metropolitan Toronto Regional Conservation Authority, into limiting population size by excluding gulls from nesting habitat by means of wire grids and harassment by trained birds of prey. Numbers of gulls in other nearby colonies were also monitored. Efforts were made to speed up response time to complaints made by farmers suffering crop depredation and a much improved system for the issuance of scare/kill permits will be employed in the coming year as part of a variety of strategies to deal with the gull problem.

The Ontario Breeding Bird Atlas has completed its fourth of five field seasons and received approximately 89,000 species observations - a record year. Analysis of this massive data set is proceeding smoothly under the guidance and support of this region together with the Federation of Ontario Naturalists and the Long Point Bird Observatory.

Waterfowl breeding pair surveys were completed for the Precambrian section of northern Ontario with the coverage of the six final survey blocks. Systematic surveys will start next year in the Hudson Bay Lowlands, the only region in the province remaining to be covered. Specific studies have also continued into the role of hybridization with Mallards in the decline of Black Ducks numbers.

Western and Northern Region

Whooping Crane Program

As part of the continuing efforts to protect and conserve the endangered Whooping Crane, CWS carried out aerial surveys in 1984 to monitor cranes and nests in or near Wood Buffalo National Park. At least 29 nests were constructed, surpassing the previous annual record of 24 nests, recorded in 1983. Only one nest contained a single egg, all other nests had the usual two eggs. One nest with two eggs was destroyed by unknown predators. Twenty-five surplus eggs were removed and 32 eggs remained in Wood Buffalo National Park. At least 20 chicks were still alive there by 20 June.

The 25 eggs collected were tested for viability and 22 live eggs were placed in nests of Greater Sandhill Cranes at the Grays Lake National Wildlife Refuge in Idaho, as part of a co-operative USA-Canada management program. Of these 22 eggs, 10 chicks eventually flew from Grays Lake with their foster-parents. One chick hatched from three eggs shipped to the Patuxent Research Centre in Maryland and that bird will be used for captive propagation purposes.

Production in Wood Buffalo National Park in 1984 was the highest on record with 15 of 20 chicks hatched successfully completing their first fall migration to Texas. Thirty-eight colour-banded birds in the Wood Buffalo National Park population have survived, some as long as eight years, and sightings of these banded birds continue to increase our knowledge of Whooping Crane biology.

As of January 1985 the world population of Whooping Cranes was about 155 birds, including 84 wild birds currently in Texas, about 35 birds in captivity, and about 36 wild birds in New Mexico.

Anatum Peregrine Recovery Project

The second draft of the Canadian Anatum Peregrine Recovery Plan was completed and circulated to each CWS region and to all provinces and territorial wildlife agencies. This draft has been accepted as the principal background document for the development of a national Peregrine Falcon recovery program which has been drafted by the Western Raptor Technical Committee to be submitted to all agencies for final approval.

Experimental pairings were successful for the second year at Wainright, with more new birds mating or laying for the first time. Incubation procedures were standardized with the anatum Peregrine Falcon. Seventy-nine anatum young were hatched and 77 were released in six provinces. Multiple releases were carried out in Quebec and the Maritimes.

Pairs were recorded nesting in four cities across Canada and there were several observations at our nest release areas.

The second year of the Latin American Program for the collection of migratory Peregrine Falcon prey species was completed in Panama and Costa Rica. The sampling went well despite some timing and logistical difficulties. This program has been very well accepted by the host countries and we received excellent co-operation and hospitality.

Monitoring Migratory Bird Populations

CWS annually monitors the status, distribution, production and mortality of major waterfowl populations through a series of operational surveys. Results of these surveys, combined with data on climate, land-use, hunting and other factors, were used in the management of this important resource.

In 1984, population surveys indicated that prairie Mallard populations were at all-time low levels. The 1984 prairie Mallard breeding population of 2.3 million represented a 20.6% decline from 1983 and a 36% decline from the 1974-83 ten-year average. Duck brood production declined by 59% in southern Manitoba, 64% in southern Saskatchewan and 41% in southern Alberta. Results of the 1984 harvest survey are not yet available; however, Migratory Bird Permit sales declined for the fifth year to 124,652, which represents a 32% loss since 1979. Record low Mallard harvests and record low 1984 prairie duck harvests are expected.

In 1979, Western and Northern Region initiated a five-year study of the population dynamics of prairie ducks. This study was designed to improve the functional understanding of the role that recruitment and mortality play in regulating duck populations. This study is providing better tools for regulating duck populations. Field work was completed in 1984 and data are now being analysed. Final reports will be produced in 1985 that will provide guidance for future duck management programs.

Crop Depredation Research

Studies on crop depredation by waterfowl focused on isolating the biological, physical, and behavioural factors that cause waterfowl to feed on farmers' grain crops. This year, the third of a four-year investigation, will provide a sounder biological understanding of granivorous waterfowl on which to base damage prevention recommendations, and should identify further research needs.

Prairie Duck Predation Studies

So that we can better understand the effects of intensive agriculture and its attendant loss of upland cover on nesting success of ducks, we are studying the effects of several nesting cover features on the predation rate by crows, the principal nest predator in the parklands. Initial results indicate that high predation rates can be predicted when ducks are forced to crowd their nests into small patches of cover resulting from intensive farming.

Mallard/Teal Residency Studies

A long-term study of nest-site selection, homing and breeding area residency patterns of Mallard, Blue-winged Teal, Northern Shovelers and American Wigeon continued in 1984. Severe drought conditions prevailed on the study area. Fewer Blue-winged Teal, Northern Shoveler and American Wigeon were present on the study area in 1984 than in 1983. Peak populations of Mallards were similar in both years. Several females marked in previous years returned to the study area in spring despite the drought. However, nest success was extremely low (e.g. 4.4% for Mallards). Trapping continued in 1984. A total of 178 hens (50% Mallards) have been trapped on the study area. Radio telemetry gear was used on a trial basis in 1984.

Terrestrial Birds in Aspen Parklands

To better understand the effects of habitat degradation on songbird populations of aspen parklands, censuses were conducted on 27 habitat patches of various sizes. Habitat patch size in combination with certain vegetational characteristics plays a significant role in determining bird species richness in the parklands. Investigation is continuing for two more years to determine the significance of these relationships.

Goose Management and Research Priorities

Suggestions were solicited from waterfowl biologists and wildlife managers in Canada and the United States to help define management and research needs for geese in Western and Northern Region. Because geese nest and/or moult in the north, their value to Canadians spans a broad geographic range and many cultural groups. Delineation of manageable population units; identification, protection and enhancement of key habitats; monitoring of important population parameters and development of demographic models are actions that would improve management of geese in the region.

Assessment, Habitat, and Enforcement

Management of the Migratory Birds Convention Act involved the issue under regulations of avicultural permits, taxidermy permits, scientific permits and sanctuary permits. Enforcement activities showed good compliance with regulations, but some charges were laid for various infractions. The Native Harvest surveys were continued with BRIA and KWF. The Peter Usher report on this program is under review. The signing of the COPE Agreement has resulted in planning for its implementation and identification of associated costs.

The Polar Bear Pass Agreement has been delayed while a general MOU with the Territorial Government is being negotiated on establishment and management of conservation areas in the north.

Environmental Impact Assessment activities have concentrated on Beaufort Sea exploration issues and defining requirements for response to the Beaufort Sea Panel Recommendations. The Shoal Lake Development in Manitoba, expansion of heavy oil field development in Saskatchewan and expansion of exploration and development in the Hayes-Zama lakes area of Alberta are other significant efforts that have been under review.

Pacific and Yukon Region

Marine Birds

The Seabirds Research Project has shifted its emphasis from breeding biology to ecosystem relationships. In 1985, a detailed analysis of the relationship between the huge migrant flocks of Bonaparte Gulls and zooplankton in the upwellings near Active Pass was begun. Active Pass is an unusually rich habitat at the limits of the Fraser River plume and is the site of unusual concentrations of several species. The research on gulls will identify the critical characteristics of that habitat and allow us to evaluate concentrations of birds and prey in other areas.

The Seabird Inventory Project continued its progress down the east coast of Moresby Island. More than half of B.C.'s large seabird colonies are located in that area, which forms the western edge of the offshore petroleum exploration area. The crew of students and volunteers discovered a colony of 15,000 Ancient Murrelets on Ramsay Island where only a few hundred were expected. The inventories are being carried out concurrently with the establishment of permanent monitoring plots. Without such plots, no long-term trends in breeding populations can be identified. Both parts of the project should be completed in 1985.

The availability of Baseline Studies funds made it possible to establish additional monitoring plots for Rhinoceros Auklets at three of the major colonies. None of those colonies are within the offshore petroleum exploration area but all are within a few kilometers of its edge and in total they contain 85% of the North American population of that species.

At the same time, comparative food habits and growth rate data were collected and a major breeding failure of Rhinoceros Auklets, Tufted Puffins and all of the other seabirds on Triangle Island was detected. The other colonies did not seem to be affected.

Waterfowl

British Columbia is the centre of the North American population of two species of duck - Barrow's Goldeneye and the Harlequin Duck. For the past five years, detailed behavioural studies of the Barrow's Goldeneye have revealed complexities of behaviour with significant management implications. Not only is it territorial on the breeding ground but it is territorial on the wintering area and returns to the same site year after year. It appears to mate for life and uses the same nest site from year to year. We have also found that nest boxes could be useful in enhancing the population if they could be protected from black bears. We are now ready to initiate monitoring of Barrow's Goldeneye populations and will prepare a species management plan in 1985-86.

The Harlequin Duck may share some of the characteristics of the Barrow's Goldeneye and has been identified as one of the important species to consider for the impact of offshore petroleum development. It will also be one of the species of ducks moulting in the Fraser Estuary to be studied in 1985-86.

Wetland Mapping (Evaluation)

The Wetland Mapping Project is designed to test the usefulness of Landsat-D imagery for describing wildlife habitats. Ground-truthing in the Fraser Estuary, Riske Creek, and Columbia River study areas continued through the summer of 1984. Each polygon was described in terms of its biological characteristics: dominant plants, percentage cover, stage of growth, substrate, and water exposure. Those characteristics were compared to special air photographs that mimic Landsat imagery.

Concurrently, water chemistry data and samples of invertebrates were collected from the ponds at Riske Creek so that habitat characteristics could be compared to the intensive waterfowl surveys that form part of the Barrow's Goldeneye project. It is hoped that this will lead to a simple method of evaluating the importance of individual ponds to waterfowl populations.

Habitat Management and Assessment

Habitat protection activities in the coastal areas of B.C. concentrated on influencing land use policies and programs of federal and provincial agencies. Provision of advice with respect to habitat requirements of migratory birds was maintained in such joint federal-provincial land use planning schemes as the Fraser River Estuary Management Program, the Squamish Estuary Management Plan and the Cowichan Estuary Plan Implementation and in response to more than 300 interagency land use referrals. Active participation in eight DOE (RSCC) Task Forces providing input to EARP Panel projects was also maintained. Habitat use data were made available for public use by publishing file data on the Cowichan River estuary collected in 1975 and on the Squamish River estuary collected in 1972-73 and in 1980. Further investigations were continued to evaluate the project of artificial island creation in the Campbell River estuary, in co-operation with DFO, BC-MOE (Fish and Wildlife) and BC-MLPH and B.C. Forest Products Ltd.,

Habitat protection activities in the Yukon Territory consisted of the maintenance of wildlife advisory services to DIAND's Land Use Advisory Committee and Regional Environmental Review Committee and of participation in departmental environmental reviews (such as the Northern Yukon Port Workshop), in co-operation with other DOE and federal agencies pursuant to the EARP. Investigations of habitat factors of high bird-use areas in the Yukon Territory continued with field work taking place in the Nordenskjold study area and reconnaissance surveys of southern Yukon wetlands in co-operation with Ducks Unlimited. Reports were published on field investigations carried out within the Yukon River Basin Study and of file data on 1979 waterfowl habitat use surveys of the Nisutlin River delta. Liaison was also maintained with departmental and DIAND personnel, in preparation for participation in the Northern Land Use Planning program.

Regulations and Enforcement

Increased awareness of migratory bird enforcement problems has been accomplished by close liaison with other enforcement agencies such as the RCMP, Department of Fisheries and Oceans, National Harbour Police, B.C. Conservation Officer Service. Part of that liaison took the form of co-operative patrols. These greatly improved hunter compliance and awareness. Only 31 prosecutions have been initiated in the Lower Mainland this year.

Aviculture and taxidermy are widespread hobbies and second sources of income to many in British Columbia. In 1984-85, 80% of the permit holders were visited and their operations inspected. Very few violators were found, which may be attributed to greater attention being paid to annual reports. The most common violations were releasing birds to the wild and failure to submit returns. Warnings were issued in cases of first instance.

WILDLIFE RESEARCH AND CONSERVATION PROGRAM

Headquarters

COSEWIC and CCEA

Secretariat services were provided to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and to the Canadian Council on Ecological Areas (CCEA).

Twenty-six additional species with nationally defined status were added to the COSEWIC list, bringing the total to 90 species. A "procedures manual" for Committee use is in preparation. A proposal for jurisdictional sharing of the costs of status report production was presented to a meeting of the Canadian Wildlife Directors and received approval-in-principle.

The second Annual Meeting of CCEA, at York University, Toronto, was held following a meeting of the Registry Workshop of Council. Financial requirements of \$83,000 were identified and jurisdictional participation according to the CCREM formula was discussed. A first biennial report in draft form was tabled, and publication of the Taschereau "status of ecological reserves" manuscript was discussed (these two projects may be published together, as the first public actions of Council).

Humane Trapping

The Interdepartmental Steering Committee on Humane Trapping, with Environment Canada providing chairmanship and secretariat, met regularly to review and co-ordinate progress and programs connected with trapping fur-bearing animals by the Canadian fur industry. To facilitate more efficient decision-making, an Executive Committee with representatives of the Departments of Environment, External Affairs, Indian Affairs and Northern Development, as well as two native organizations, was established.

A position of Co-ordinator, Humane Trapping, has been added to co-ordinate the department's ongoing interests in research and development of humane trapping systems, trapper education and the continuing development of National Humane Trap Standards. Environment Canada provided \$395,000 to the Fur Institute of Canada (FIC) as part of its commitment over four years of \$1.5 million specifically for research and development of humane trapping systems. The Co-ordinator, Humane Trapping, acted as Chairman of the FIC's Humane Trap Research and Development Committee under whose direction research is carried out.

Construction of a facility for developing and testing humane trapping systems began at the Alberta Environmental Centre at Vegreville and will be fully operational by the fall of 1985. Recruitment of a five-person Project Team, dedicated to the program at AEC for an initial four-year period, is underway. It will consist of a team leader with a Ph.D. in biology, a mechanical engineer to the M.Sc. level and three technical staff.

Research related to live trapping systems and the ongoing development of National Trap Standards is expected to commence at other facilities in the spring of 1985.

CITES

Scientific advice was provided on the import and export of plants and animals included in the Appendices of the Convention on International Trade in Endangered Species (CITES) in consultation with the CITES authorities in the provinces and territories. Considerable time was spent investigating a request from a Canadian zoo to import a young wild-caught gorilla from Cameroon; the request was denied. In preparation for the next meeting of nations party to CITES in April 1985, recommendations were made to the CITES Administrator on tentative Canadian positions vis-à-vis proposals to increase, decrease, or end the CITES protection afforded a variety of species around the world. A public hearing was held in March 1985 to get views and scientific information from the public on the CITES proposals.

Regional Activities

Atlantic Region

Co-operative Research

Co-operation with Newfoundland on research on the George River Caribou Herd was continued. To date over 100 wolf carcasses have been examined for sex, age, reproduction and condition as part of a study to determine the status and role of wolves in the dynamics of the herd.

Rare and Endangered Species

In co-operation with the provinces of New Brunswick and Nova Scotia and Parks Canada, 16 young Peregrine Falcons were successfully released at two sites at the head of the Bay of Fundy. Observation reports of the elusive eastern cougar continue to be submitted, none of which could be substantiated. Surveys of Piping Plover nesting beaches in Prince Edward Island and northern New Brunswick indicated a substantial drop in nesting success in 1984 due to severe early summer storms.

Research in National Parks

Six pine marten were released in Fundy National Park in an attempt to reintroduce this native species to other parts of its former range. The marten's large range and vulnerability to snaring and trapping have led to many of the animals released in Terra Nova National Park being accidentally killed outside the National Park.

A study of predators was begun in Fundy National Park. The objectives of the project include the determination of the interrelationships of the newly established coyote with other resident predator species.

A five-year program to develop and implement fish management plans for the Atlantic Regional National Parks was continued. Existing data were reviewed and research in specialized studies of fish population dynamics undertaken.

Forestry-Wildlife

Studies on the effects of plantations on wildlife communities was completed with assessments of wildlife populations in adjacent mature stands, particularly hardwood ridges that are planned to be converted to softwood. Wildlife inventories of plantations prior to and after herbicide application were conducted.

Quebec Region

Rare and Endangered Species

This year, CWS Quebec carried out an experimental massive release of 14 Peregrine Falcons at Cap-Tourmente.

Also, an adult female probably released in Cap-Tourmente in 1983 joined the young Falcons.

Ontario Region

Wildlife Research

Deformities in fish-eating birds of the Great Lakes have once again manifested themselves after a decade's absence. In 1983, USFWS researchers discovered bill deformities in Forster's Terns and Double-crested Cormorants in Green Bay, Lake Michigan. CWS Ontario Region biologists working in the Great Lakes in 1984 discovered deformed

cormorants in Lake Huron (two in 2089 chicks handled) and Lake Ontario (three in 448 chicks handled). The abnormalities included cyst-like growths on eyes and twisted bills.

CWS helped organize a national symposium on forestry and wildlife management. The purpose of the symposium, which was held in Vancouver in May 1984, was to promote the integration of forestry and wildlife management in Canada. It consisted of 2½ days of formal sessions, plus 1- and 2-day field trips to see forestry and wildlife management areas in southern British Columbia. About 175 people, evenly split between foresters and biologists, attended. The 24 papers presented at the symposium were published in the Forestry Chronicle, the journal of the Canadian Institute of Forestry, in March 1985.

Western and Northern Region

Research on Barren-ground Caribou Beverly Herd

A five-year study of the effects of forest fires in the Northwest Territories on the movements and physical condition of the Beverly herd of barren-ground caribou is in its third year. The adequacy of the present forested winter ranges to support the population is being assessed by examining the physical condition of the caribou in early and late winter. The Fort Smith Hunters and Trappers Association is co-operating in this aspect of the study. The movements of the herd in relation to burns is monitored every 4-6 weeks from October to May. The biomass of caribou forages on the winter range is measured during the summer months to learn more about habitat changes with time following fire. Preliminary results suggest that sufficient winter range is available to the herd; however the caribou are not using portions of the historical winter range that have a high burn rate.

Polar Bear Studies

Specific studies of the influence on polar bears of ice conditions, of seal distribution and abundance, and of polynyas continued at Dundas Island in April. The biological importance of polynyas to overwintering populations is being evaluated by studying winter and early spring distribution and abundance in and out of polynya areas. Under-ice walrus vocalizations were recorded and data collected on walrus behaviour. Monitoring of the polar bear population continued, with some mark-recapture work in the area of the polynyas.

During the study of polar bear reproductive ecology in Manitoba, field studies during both spring and fall 1984 were conducted primarily to determine what effects an apparently poorer nutritional condition in autumn 1983 would have on subsequent reproductive success of females. In addition, further data were collected on other ongoing studies,

including the determination of reproductive parameters in female polar bears, annual body weight changes, movements of bears while ashore, and the degree of fidelity shown by bears to particular sites. Two new drugs (Telazol R and Yohimbine R) were tested to improve summer handling procedures, with promising results.

Final analyses were also completed on a three-year study of the ecological significance of supplemental food to polar bears near Churchill, Manitoba.

The 1984 field study of the distribution and abundance of polar bears in Hudson Bay centred on the population of bears ashore on the western coast during the summer. Of 155 bears captured and marked along the coast, 45 were radio-collared to determine distribution, movement patterns, and population discreteness. Over 650 relocations of radioed and marked bears were obtained from incidental sightings and from five aerial surveys between August and November. The data will be analysed in conjunction with data collected in previous years to design an accurate and unbiased method of estimating the population size. In fall 1984, research was initiated on the deposition and utilization of fat in polar bears as a method for determining physical condition. Data collected on hunter-killed polar bears was conducted out of Coral Harbour. Techniques were developed for field measurements of the distribution and partitioning of fat within the bodies of bears of all conditions. As well, the relationship of muscle and bone tissues to fat reserves was emphasized. Finally, laboratory analysis of fat, muscle and bone tissues collected in the field will measure their fatty acid composition. After the techniques have been refined, other sites such as Clyde River and Resolute, where polar bears are killed in spring, will be considered for comparative work.

Rare and Endangered Species

Three endangered species' programs are currently under way to rehabilitate wood bison, to rehabilitate swift fox and to determine the current status of Peary caribou in the Canadian High Arctic.

Under the terms of a co-operative five-year agreement, signed with Alberta, 29 wood bison were transported from the source herd at Elk Island National Park to Hay-Zama in northwestern Alberta during February 1984. The bison are being held there in corrals. The first release to the wild is scheduled for spring 1986 and those bison released will be monitored using radio-telemetry techniques. The transfer of 34 wood bison, supplied by zoos co-operating in the captive breeding program, was made to Waterhen, Manitoba, during February 1984. The Waterhen Indian Band is managing the captive herd. Nine calves were born during May and June 1984. The initial stock will be maintained in a larger (2300 ha) enclosure from which only progeny will be released to the wild. The establishment of the wild herd is to be guided by a joint CWS-Manitoba-

Waterhen Indian Band management authority. This project has resulted from the co-operative efforts of many other government agencies at the provincial and federal level as well as non-government organizations.

A co-operative five-year agreement for the establishment of wood bison in the southwestern Yukon was signed in July 1984. Construction of a 5 km² corral commenced with the placement of posts. Transfer of 30 wood bison has been delayed until completion of the enclosure, which is scheduled for fall 1985.

A March 1984 survey of the wood bison that were transferred to the Nahanni River in the N.W.T. in June of 1980 indicated that at least 20 animals, including three calves, were located in the Liard and Nahanni River valleys. Survival and recruitment of calves into the breeding population suggests that marginal re-establishment is occurring.

CWS, in co-operation with the governments of Alberta and Saskatchewan, the University of Calgary, and the Wildlife Reserve of Western Canada Cochrane, Alberta, has experimentally released swift foxes in both Alberta (October 1983) and Saskatchewan (July 1984). Monitoring of the Alberta release showed that three pairs bore a total of 12 pups in the spring of 1984. Six of these pups were collared but only one remains alive as of February 1985.

Coyote predation appears to be the most significant cause of mortality among released swift foxes in Alberta. At least seven have been killed by coyotes and two by bobcats.

Ten collared and seven uncollared swift foxes were experimentally released in southwestern Saskatchewan. Only two of the collared foxes remain alive after seven months. The reasons for this high mortality are unclear but could be related to extreme drought conditions.

CWS is concerned with the current status of Peary caribou in the Canadian High Arctic; thus in 1984 CWS initiated an exploratory period devoted to development, field testing and evaluation of techniques for carrying out aerial surveys of Peary caribou. Field tests were carried out in the High Arctic during the months of May and July 1984. The evaluation of this testing will allow CWS to obtain better estimates of the current status of Peary caribou and in turn will permit CWS to provide COSEWIC with the necessary updating on the need for protection of Peary caribou as one of Canada's truly unique forms of wildlife and an important part of Canada's natural heritage.

Forestry/Agriculture/Wildlife Interactions

After a 27-year study on the effects of clear-cut logging on wildlife and their habitats within three forest types (white spruce, lodgepole pine, mixed wood) of the foothills region in Alberta, a summary report was

prepared entitled "Effects of Clear-cut Logging and Scarification on Wildlife Habitats in West-Central Alberta". Results from this study are being used by the Alberta government and the forest industry in the development of a Forest-Wildlife Management Plan for 7700 km² St. Regis (Alberta) Ltd. lease area in the Hinton region.

Reports were also under preparation on the impact of patch cutting on wildlife habitat in the Streeter Basin Experimental Watershed. Seven years after cutting, the supply of browse and its utilization by ungulates were about the same in both treated and control blocks. As a result of the November federal budget cuts the regional forestry/agriculture/wildlife interactions program was terminated effective 1 April, 1985.

Research in National Parks

The Parks Research Section conducted a wide range of fisheries and wildlife research projects in the national parks of western and northern Canada in 1984-85. A major report was prepared which evaluated a grasslands prescribed burn program in Prince Albert National Park. This program had been initiated in 1975-76 to examine the role of fire as a management tool in maintaining the rough fescue grassland communities in the park.

A final report on wolf-bison interactions in Wood Buffalo National Park was completed. This report summarizes three years of research on the significance of the wolf as a predator on park bison.

A survey of Trumpeter Swans and swan habitat in and around Nahanni National Park was completed. Eighteen adult swans, consisting of seven pairs and four single birds were observed. The number of paired birds suggests that the breeding population may be increasing. Because the Canadian population now consists of approximately 120 breeding pairs, the park could support a significant component of this population.

An important collation and synthesis of bird observations in Nahanni National Park was published in booklet form in the Special Publication Series of the Saskatchewan Natural History Society.

The tenth report in a series on limnological studies in the North Boundary Lakes of Jasper National Park was completed.

A review of fishery management investigations in Riding Mountain National Park was also concluded. The report reviews past and present fishery management investigations in the park, evaluates strengths and weaknesses of the information base, recommends future fisheries studies, and suggests possible sport fish management strategies.

As a result of the November federal budget cuts, the Parks Research Section ceased to exist on 1 April 1985.

Pacific and Yukon Region

Porcupine Caribou

Work on the Porcupine Caribou Herd continued through 1984-85 with NOGAP and CWS A-base funds. The initial field season on caribou use of summer range and the effect of insect harassment was completed. Two reports were published and drafts of six others were prepared. Don Russell was active as the local organizing chairman of the 4th International Reindeer/Caribou Symposium that will be held in Whitehorse in August 1985.

Forest Birds

The forest birds research program progressed along three fronts in 1984-85. The rudimentary predictive model relating forest bird density to seral stage in several forest types of British Columbia was completed. Field testing of the model is needed. Field work continued on assessing the effects of selective logging on bird populations in Interior Douglas Fir and Ponderosa Pine forests. A contract titled "Study of the effects of bird predation on forest insect pests in B.C." was let for completion by 31 March 1985.

Wildlife Toxicology

Headquarters

Our work in the bio-effects monitoring field moved from the setting up of assays in the laboratory to the phase of limited field testing. Material from the Great Lakes was examined for levels of vitamin A porphyrins and thyroid function. In all cases differences were found between material from the Great Lakes and the comparatively clean material collected from marine colonies. The detailed characterization of mixed-function oxidases in Herring Gulls and puffins was completed as part of the Energy Research and Development program to set up a bio-assay system for chronic oil pollution in the marine system. The data also serve as a baseline for studies on pollution from a variety of sources across Canada. Transfer of our expertise on bio-effects monitoring to the UNEP Mediterranean Sea Program was aided by one of the CWS scientists working in the laboratories at the University of Siena, Italy. Glen Fox started on his toxicology training at the University of Surrey in September.

Atlantic Region

Efforts were continued to monitor and evaluate the effects on migratory birds of chemicals used in forest spray programs. A study on the effect of Zectran R on the behaviour of forest songbirds was completed.

Quebec Region

The impact of PCB contamination on bird colonies in English Bay in the Baie-Comeau area was investigated. The results of this study which will also contribute to evaluating the reproductive success will be known in 1985. Three species of bird were investigated: Herring Gull, Ring-billed Gull and Double-crested Cormorant.

Western and Northern Region

A field study on the new insecticide deltamethrin was designed and initiated. This pesticide can be applied aerially. The objective was to determine the effects of the insecticide on slough invertebrates and ducklings as a result of inadvertent aerial applications to wetlands. The field project was carried out jointly with personnel from the University of Saskatchewan and Hoechst Canada Ltd. Preliminary results showed almost total mortality of invertebrates and ducklings (presumably as a result of starvation). Another field project funded by Dow Chemical

to determine the effects of Lontrel R on submergent vegetation in wetlands was also completed.

As a result of the November federal budget cuts, the regional toxicology program was terminated on 1 April 1985. The deltamethrin and several other projects were left unfinished.

Wildlife Pathology and Parasitology

The Pathology and Parasitology Section investigated, diagnosed and advised on die-offs in various species of wildlife. Section personnel examined numerous specimens of several species of wildlife submitted for diagnosis by various agencies, held immobilization workshops, continued monitoring of caribou for brucellosis, assisted in transplants of the endangered wood bison, and provided advice on aspects of wildlife health ranging from avicultural premises to sylvatic giardiasis. Baseline studies were continued or completed on Ungava caribou coccidia, Beverly caribou calf mortality and pine marten parasites. As a result of the November budget reductions this program was terminated 1 April 1985.

Bioelectronics

The Bioelectronics Unit supplied telemetry equipment, advice and support to CWS for studies on polar bear, grizzly, coyote, bobcat, seal, and turtles; for transplants of pine marten; as record-timers for bird vocalization; and as incubation temperature and departure monitors for Leach's Petrel. As a result of the November budget reductions this program was terminated 1 April 1985.

Environmental Chemistry

Chlorinated dioxin and furan methodology development was completed, and a contract let with TOXFUNDS to construct an automated sample enrichment apparatus, which will be in routine use by April 1985. This apparatus separates lipids from organochlorine compounds and then isolates chlorinated dioxins and furans from other organochlorines. Up to three samples can be processed automatically.

Approximately 60 wildlife samples were analysed for chlorinated dioxins. These included retro-analysis of archived Herring Gull eggs collected from six colonies in the Great Lakes over the period 1981-84. The most toxic isomer, 2,3,7,8-TCDD, was the predominant compound found in all lakes. Levels increased several-fold in a number of colonies between 1980 and 1981 or 1982 and have declined steadily since that time. This behaviour parallels that for most other organochlorine contaminants. We do not as yet have any explanation for these Great Lakes basin-wide fluctuations in contaminant levels. Saginaw Bay, Lake Huron and all of Lake Ontario are consistently the most dioxin-contaminated areas.

Samples of Great Blue Heron eggs and several species of fish from three selected areas in British Columbia with a history of chlorophenol use and one control site were analysed for chlorinated dioxins and furans. The dioxins and furans found were consistent with those known to be present in chlorophenols in most cases. Heron eggs from one area contained levels of a hexachloro-dioxin that were high enough to have caused chick-oedema disease in a sensitive species (e.g. chickens), and further assessment of the impact of chlorophenol use on fish-eating birds is warranted in these areas.

Samples from the tissue bank that were collected in Surinam in the early 1970s and known to contain high levels of pentachlorophenol were analysed to determine the dioxin and furan isomers likely to bio-accumulate from this source. There appeared to be significant differences between these samples and the heron eggs from British Columbia.

Polar bear samples collected in 1982 were also analysed for dioxins. Surprisingly, detectable levels of 2,3,7,8-TCDD and octachloro-dioxin were found in all samples. The ratio to PCB levels was in line with those from other remote areas, however, indicating that contamination of aquatic ecosystems with trace levels of these dioxins is quite general and they can be considered ubiquitous pollutants along with PCBs, DDT and other well-distributed organochlorine compounds.

A second collection of polar bear samples (fat and liver) was initiated in the fall of 1984 in co-operation with the NWT Wildlife Service and Inuit hunters. This collection covers the rest of the bears' range in Canada that was not sampled in 1982, mainly Baffin Island and Hudson's Bay. These samples are being analysed for the whole range of organochlorine contaminants, including dioxins and possibly heavy metals. DFO has been co-operating with this study of arctic contaminants. Seals and some whale samples from different areas in the Arctic are being analysed at NWRC by a research scientist from the Freshwater Institute for comparison with the polar bear data. Preliminary data suggest that the polar bear has a remarkable capability to metabolize aromatic organochlorine compounds, including DDE and PCBs, in comparison to seals. Re-analysis of some polar bear samples from the tissue bank will be done in 1985-86

for direct comparison with these data. These studies will help us to understand how and from where persistent contaminants are transported into the arctic. The pattern of contaminants in continental North American air masses in the 1970s shows a strong resemblance to that found in polar bears in 1982.

Two projects related to marine environment contamination in the Atlantic were completed in 1984. The first was a re-analysis of tissue bank and newly collected samples of Gannet eggs from Bonaventure Island over the period 1968-84. Difficulties in early analysis of DDT compounds due to lack of recognition of PCB interferences rendered older data difficult to interpret. Very high levels of DDE were present even after cessation of forest spraying with DDT in New Brunswick in 1968. A significant decline was observed between 1970 and 1973, and this has continued to the present.

The second project was the regular monitoring of contaminant levels in Atlantic colonies of Leach's Petrels, Common Puffins and Double-crested Cormorants. This survey is conducted every fourth year and began in 1968. Re-analysis of some tissue bank samples from 1968 was also done. Bay of Fundy locations had significant declines of DDE over this time period. High levels in early years were probably due to proximity to forests sprayed with DDT. There were no clear trends in contaminant levels emerging from the colonies in Newfoundland remote from point source contamination. This indicates that overall levels of organochlorine contamination in north Atlantic water have not declined significantly due to bans imposed on the use of most organochlorines in the late 1960s and early 1970s.

Work on the model for toxic chemicals dynamics in Herring Gulls was completed. Three papers describing the energy budget of the gull, clearance rates of contaminants from caged juveniles, and clearance rate of radio-labelled DDE from free-living adults were prepared and submitted for publication. In the next year, the model will be tested and validated with routine monitoring data.

The Fourth International Symposium on Chlorinated Dioxins and Related Compounds was sponsored in part by Environment Canada and held in Ottawa in 1984. CWS contributed data on Great Lakes surveillance to a paper presented by Dr. D. Stalling of the US Fish and Wildlife Service. Dr. Norstrom chaired the first day's session on Analysis, Fate and Source Determination and is a guest editor of the proceedings of the conference. An invitation to present one of two plenary lectures at the Chemical Health Hazards group sponsored by the Swedish Council for Co-ordination and Planning of Research in Stockholm was accepted. Dr. Norstrom presented a lecture, "Organochlorines in Great Lakes Herring Gulls: a Decade of Interdisciplinary Research", which was well received. A poster was also presented at the International Symposium on the Analytical Chemistry of Pollutants in Barcelona. Dr. Norstrom was appointed a member of Committee H, the overseeing body for development

of collaboratively studied methods in the field of environmental pollutants and hazardous substances for the Association of Official Analytical Chemists, Washington, DC.

TOXIC CHEMICALS

Risk Assessment

Again this year the main focus of the program activities concerning assessments of the impacts of toxic chemicals on wildlife health and habitat was on those new industrial chemicals subject to review under Section 4(6) of the Environmental Contaminants Act and those pesticides for which registration and research permits are sought, or those that were re-evaluated under provisions of the Pest Control Products Act. A co-operative project with the Environmental Protection Service and Fisheries and Oceans Canada to prepare draft guidelines for environmental chemistry and information requirements for pesticide registration was undertaken. The review of the impact of pesticides on prairie wetland and waterfowl productivity was expanded to include additional insecticides and herbicides in use in western Canada and is now scheduled for completion in September 1985. Research to develop the forest spray simulation chamber, using the Zebra Finch as an experimental system for assessing spray toxicity and routes of exposure of small birds to small droplets continued; acetylcholinesterase inhibition time patterns in the Zebra Finch and the influence of droplet size were examined. Continuation of this project is under review.

The second and final year of the study to identify data requirements for demonstration of toxic effects of pesticides in model ecosystems was completed.

Residue Monitoring Services

The Toxic Chemicals Programs Section continued to provide effective scientific support services for the research and monitoring activities of the CWS - Wildlife Toxicology, LRTAP, Toxic Chemicals, and Latin American programs. These services involve the preparation of biological specimens for either toxic chemical residue analyses or for archiving in the CWS National Specimen Bank, and the management of all contracts for chemical analyses including quality assurance requirements. The section also manages all residue and related data by operating the National Registry of Toxic Chemicals Residues. The inventory and reorganization of the National Specimen Bank holdings was completed this year. The first phase of the project to review and rationalize organochlorine chemical residue monitoring activities of CWS was completed; this phase involved analysis of all CWS seabird-toxic chemical residues data.

LONG-RANGE TRANSPORT OF AIRBORNE POLLUTANTS (LRTAP)

The first phase of the LRTAP studies on the composition of wildlife communities along a gradient of lake acidity has been completed. A comprehensive review was undertaken by CWS and it was decided that future efforts to determine the changes in trophic relationship caused by acidification would be concentrated in high deposition areas of Ontario and in the calibrated basin at Keji. Four proposals covering these studies were presented to the Royal Society for review.

Atlantic Region

LRTAP biological studies (amphibians, zooplankton, aquatic plants, planktonic primary production) in the Kejimikujik Calibrated Watersheds, Nova Scotia conducted since 1980 have been reported, and the preparation of a synthesis report on this subject has commenced. At the same time, a preliminary report on the relative importance of organic versus anthropogenic (LRTAP) acidity on poorly buffered Nova Scotia waters was prepared and a thorough analysis of five-year water quality data (1978-83) obtained in conjunction with the biological studies began to clarify this problem. A new three-year study was initiated to study the effects of acidification on nutrient availability in surface waters, and to assess its possible role on the productivity of aquatic bird and mammal populations in the Atlantic Region.

Quebec Region

Certain duck species prefer to raise their young on acid lakes. This discovery led to the development of an experimental research project in the wild. Members of the research team raised ducklings on acid and non-acid lakes to determine how acidity affects the feeding and growth of two species of ducklings (i.e., Black Duck, which is known to avoid acid lakes, and Common Goldeneye, which seems to prefer acid lakes).

Analysis of the data collected in the summer of 1984 shows that only the acid lake with fish was not conducive to growth for both species of ducklings and in particular for Black Duck. It seems that both the high acidity and the presence of fish interfere with the feeding of ducklings.

Common Goldeneyes seem to prefer acid lakes because highly acid lakes usually contain no fish which compete for large aquatic insects.

Ontario Region

LRTAP I studies documenting the mechanisms by which acidic precipitation has influenced waterfowl populations in northern Ontario, through its

impact on trophic relationships, have been completed; analysis and write-up continue. In 1984-85, LRTAP III studies were initiated to examine the hypothesis that lake acidification is limiting the abundance of major invertebrate prey species at crucial stages in the nesting cycle, thereby reducing waterfowl productivity. Specimens of five major waterfowl species were collected during the brood rearing period for examination of gut contents. Major prey taxa identified were Odonata, Trichoptera, Hemiptera and Coleoptera. Toxicological analyses of pinfeathers, kidney and liver tissue for trace metal contamination is currently underway. To develop a program for the quantitative estimation of major waterfowl foods, several novel sampling techniques were applied on a set of 18 lakes exhibiting a wide range of pH and fish communities. Further refinements of equipment and techniques will be applied to quantitative collections of major prey taxa in 1985. To examine the relationships among acidic precipitation, the chemistry of wetlands (bogs and fens), and the fauna of these wetlands, a preliminary investigation of 48 peatlands was conducted in November 1984. Information gathered has been used to select peatlands for a more detailed study in 1985.

INTERPRETATION PROGRAM

Atlantic Region

Through two Canada Works special employment programs, interpretation program developments were initiated and/or continued at Chignecto National Wildlife Area and at Shepody National Wildlife Area. Interpretation guidelines were prepared for other National Wildlife Areas. A reduced program was continued at Huntsman Marine Laboratory, St. Andrews, New Brunswick. Data were collected for the completion of the regional interpretation plans. A booklet and videotex program on seabirds were completed and distributed as was a colour brochure on bird-watching in New Brunswick.

Québec Region

Percé Wildlife Interpretation Centre

Major renovations took place at Percé Wildlife Interpretation Centre. The new exhibit hall is twice as large as before, occupies two buildings and provides new facilities for the cooperating association. A total of 74,600 people participated in program activities.

As a result of the ministerial decision to terminate the CWS Interpretation Program, the Percé Centre was transferred to the ministère québécois du Loisir, de la Chasse et de la Pêche in the spring of 1985.

Cap Tourmente Wildlife Interpretation Centre

During 1984, the Interpretation program at Cap Tourmente was improved to make it more efficient and more interesting. The general orientation of the program focusses on both the enhancement of avifauna in the Cap Tourmente National Wildlife Area and the relationship that exists between wildlife and man.

Certain projects were accomplished through the assistance of the NEED program, including an exhibit showing the history of the site (Petite Ferme), the publication of a complimentary brochure, the preparation of a self-guided interpretation program for high school students and the production of display panels for identification (winter birds) and orientation (trail maps).

Statistics showed that 130,643 people visited Cap-Tourmente, of whom 17,000 had direct contact with naturalists.

As of April 1985, the management of the Interpretation program was turned over to la Société Linnéenne du Québec Inc.

Through the aid of federal employment assistance programs, interpretation activities were carried out in the Baie de l'Isle Verte National Wildlife Area and at the centre de la montagne sur le Mont-Royal in downtown Montreal. This was a joint effort with the City of Montreal, Quebec ministère Energie et Ressource and the University of Montreal. An awareness program of the problems of seabirds on the Lower North Shore resulted in the opening of a small museum at Harrington Harbour. In the spring of 1985, a comic-style booklet, titled "L'oiseau qui rêvait d'être marin" (If I could only be a seabird) will be distributed to children on the North Shore.

Ontario Region

An Agreement has been concluded between Environment Canada and the Friends of Wye Marsh transferring operation of the Centre to the "Friends" for a 10-year period. The Friends have agreed to provide wildlife interpretation on the grounds and in the marsh area. Bob Whittam has been loaned to the Friends for a period of three years under an Interchange Canada agreement. He will act as Executive Director of the Friends of Wye Marsh and will be responsible for day-to-day operations at the Centre and for completing the transition to private operation.

Western and Northern Region

Regional Interpretation

The staffing of the Wildlife Interpretation Biologist position in Winnipeg allowed the continuation of a joint interpretation effort with Ducks Unlimited and the province of Manitoba.

Prairie Wildlife Interpretation Centre

Another very successful season was held - a tribute to the high quality of the program. However, budget reductions announced in November 1984 terminated the program as a CWS responsibility.

Pacific and Yukon Region

Attendance at the Creston Wildlife Interpretation Centre was about 30,000. In addition, new programs were started at the Qualicum NWA and in Stanley Park in Vancouver. Radio programs on CBC were broadcast every week. The largest effort was directed toward the planning of a program

at the Reifel Migratory Bird Sanctuary in co-operation with the B.C. Waterfowl Society. Construction of many new facilities was started there as part of a three-stage development to make the site a centre for public involvement in wildlife activities in the province. New low-cost ventures were also started in Tofino with Ducks Unlimited and B.C. Environment Ministry, and at Vaseux-Bighorn NWA with B.C. Parks and Environment Ministries. The entire program is estimated to have reached nearly two million people. Inquiries about the program came from as far away as Australia and Borneo.

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES OF WILD FAUNA AND FLORA (CITES)

As the Convention on International Trade in Endangered Species approaches the tenth anniversary of its entry into force - 1 July 1975 - more than half the approximately 160 nations in the world are now party to it. With the exception of Mexico, all major countries involved in the trade of animals and plants as well as their parts, derivatives and manufactured products belong to CITES. Between 1 April 1984, and 31 March 1985, three countries added their names to the list of CITES Parties: Benin, the Netherlands, and Trinidad and Tobago. This brought the total number of CITES Parties to 87.

In an effort to keep the diversified groups of people having an interest in CITES up to date with the regulations and the basic requirements of the Convention, CITES officers met with many people during 1984. Training of enforcement officers continued, with nearly 250 Customs officers attending a total of 28 seminars on CITES. Most of the seminars were held at the Customs Training College in Rigaud, Québec, with "field" sessions at Montreal, Québec City, Niagara Falls, Fort Erie and Hamilton. In addition, approximately 90 RCMP officers participated in seminars in Ottawa and Regina or attended along with Customs at the sessions in Niagara Falls and Hamilton. As of 1 December 1984, approximately 1,615 Customs and RCMP officers had attended over 140 CITES seminars since the inception of the program.

Ontario Ministry of Natural Resources (OMNR) personnel continue to show an increasing interest in CITES. At the request of the OMNR, presentations were given in North Bay, Englehart and Thunder Bay to 72 people, mainly conservation officers. The Association des biologistes du Québec (ABQ) also expressed an interest in CITES resulting in a speech at a regular meeting of the ABQ in Québec City on 17 November 1984. Approximately 75 people heard the CITES speeches at these meetings. In addition, the yearly update on CITES was provided to the Canadian Association of Zoological Parks and Aquariums (CAZPA) at their annual meeting held in Winnipeg, 6-8 September 1984.

A continuing and nagging problem for Customs and the RCMP in enforcing the CITES regulations is identification not only of living specimens but also their parts and products. At least partially to overcome this problem, CWS has obtained under contract the services of identification consultants in major centres across Canada. By way of 15 contracts, some with major organizations such as museums, zoos and universities, and with several other people working free of charge, assistance with identification is now provided in Halifax, Montreal, Toronto, London, Winnipeg, Saskatoon, Edmonton, Calgary and Vancouver. In addition, the CITES staff have been supplementing the efforts of the identification consultants by identifying goods detained by Customs in Montreal, Toronto and Ottawa. A total of 26 days during the year were spent by CITES staff providing this service.

The CITES Management and Scientific Authorities of the CWS represented Canada on several occasions on the international scene. In June 1984, the Management Authority attended a seminar for African states on the implementation of CITES as well as a meeting of the CITES Technical Committee. Following these two meetings, both of which were held in Brussels, Belgium, the Management Authority travelled to Switzerland to represent the North American region at a meeting of the CITES Standing Committee.

During November 1984, 123 proposals to amend the CITES Appendices were received from the CITES Secretariat in Switzerland. The proposals are for consideration at the Fifth Meeting of the Conference of the Parties to CITES scheduled for 22 April-3 May 1985, in Buenos Aires, Argentina. Of interest to Canada were proposals for the transfer of the narwhal, Monodon monoceros, from Appendix II to Appendix I; the addition of the hooded seal, Cystophora cristata, to Appendix II; the transfer of the North American populations of the Gyrfalcon, Falco rusticolus, from Appendix II to Appendix I and the addition to Appendix II of all cranes, Gruidae spp., not already regulated. In preparing Canadian positions on these proposals and other related CITES matters, both the Management and Scientific Authorities travelled to Washington, D.C., on two occasions to obtain background information. In addition, input from the public was sought at a public hearing held 12 March 1985, in Hull, Quebec.

In 1984, federal, provincial and territorial CITES authorities issued 3,597 endangered species export permits mainly for Appendix II species. During the same period the federal authority approved 38 endangered species import permits for Appendix I specimens, 29 Transit Certificates primarily for temporary entry of circus animals, and 51 Scientific Certificates for the non-commercial loan, donation or exchange between scientists of prepared scientific specimens.

