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HabitatMatters

2019 Canadian NAWMP Report



"Blue – Canvasback" from the 2019 Canadian Wildlife Habitat Conservation Stamp series.

Artist: Claude Thivierge



North American Waterfowl
Management Plan

Plan nord-américain de
gestion de la sauvagine

Plan de Manejo de Aves
Acuáticas Norteamérica

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About the NAWMP

The North American Waterfowl Management Plan (NAWMP) is an international partnership to restore, conserve and protect waterfowl populations and associated habitats through management decisions based on strong biological foundations. The ultimate goal is to achieve abundant and resilient waterfowl populations and sustainable landscapes. The NAWMP engages the community of users and supporters committed to conserving and valuing waterfowl and wetlands.

In 1986, the Canadian and American governments signed this international partnership agreement, laying the foundation for international cooperation in the recovery of declining

Mallards.
Catherine Jarjour

waterfowl populations. Mexico became a signatory to the NAWMP with its update in 1994. As a result, the NAWMP partnership extends across North America, working at national and regional levels on a variety of waterfowl and habitat management issues.

Since its creation, the NAWMP’s partners have worked to conserve and restore wetlands, associated uplands and other key habitats for waterfowl across Canada, the United States and Mexico. The partners have had wide-ranging influence: shaping land-use, agricultural and public policies; integrating science and monitoring systems into planning; and delivering habitat programs. The results of these efforts are notable. Many waterfowl populations are substantially larger now than they were in 1986, and NAWMP partners have reached out to collaborate with other bird conservation initiatives.

In Canada, NAWMP partner activities are directed by public-private Joint Venture partnerships, which focus on areas or species of concern identified in the NAWMP. Each Joint Venture includes a range of partners from federal, provincial and local governments to conservation organizations. Strategic and Implementation Plans, developed based on the NAWMP’s goals as well as on pressures specific to the Joint Ventures, form the basis of each Joint Venture’s programs and individual projects.

Terminology used in this report

Securement

The protection of wetland and/or upland habitat through land title transfer or binding long-term (minimum 10-year) legal agreements with a landowner.

Influence

Direct actions taken by landowners, land managers or conservation agencies that protect or enhance wetland or associated upland habitats without legal or binding agreements. These direct actions result in applied land-use changes.

Enhancement

Actions carried out on wetland and/or upland habitats to increase their carrying capacity for wetland-associated migratory birds and other wildlife.

Management

Activities conducted on secured wetland and/or upland habitats to manage and maintain their carrying capacity for wetland-associated migratory birds and other wildlife.

National Overview

Long-tailed Duck.

Anthony Zerafa

Accomplishments by Habitat Joint Ventures (1986–2019)

22.8

Million acres of habitat secured

(9.2 Million hectares)

Involves the protection of habitat through land title transfer or binding legal agreements with landowners (10-year minimum).

167.1

Million acres of habitat influenced

(67.6 Million hectares)

Involves direct actions that protect or enhance habitat without legal or binding agreements. These actions result in applied land-use change.

3.5

Million acres of habitat enhanced

(1.4 Million hectares)

Involves actions that increase habitat carrying capacity for waterfowl and other wildlife.

Accomplishments by Habitat Joint Ventures (2018–2019)

549.1

Thousand acres of habitat secured

(222.2 Thousand hectares)

358.7

Thousand acres of habitat influenced

(145.1 Thousand hectares)

356.5

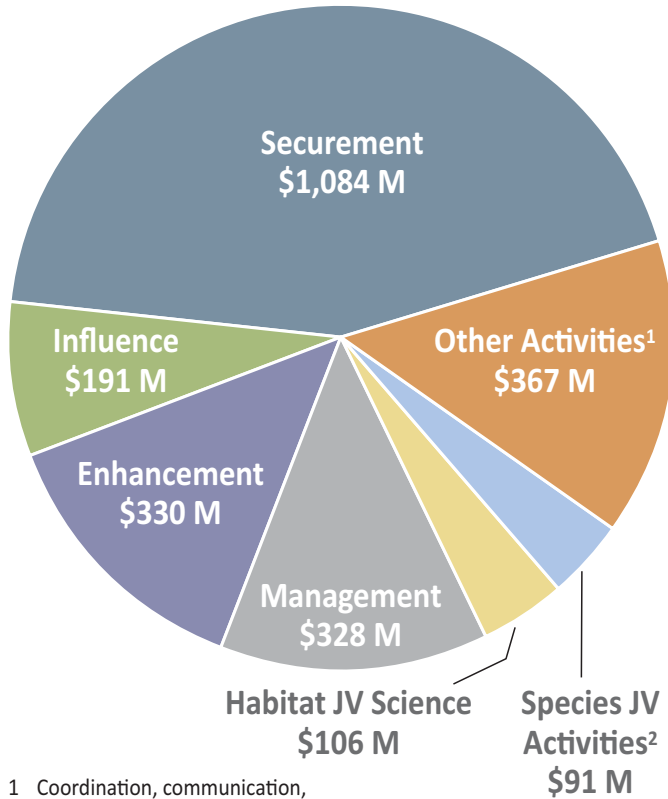
Thousand acres of habitat enhanced

(144.3 Thousand hectares)

Note: Managed acres will no longer be reported in *Habitat Matters* to prevent redundant data, as all managed acres occur on secured land.

Expenditures

By activity 1986 to 2019
(\$2,497 M CAD)



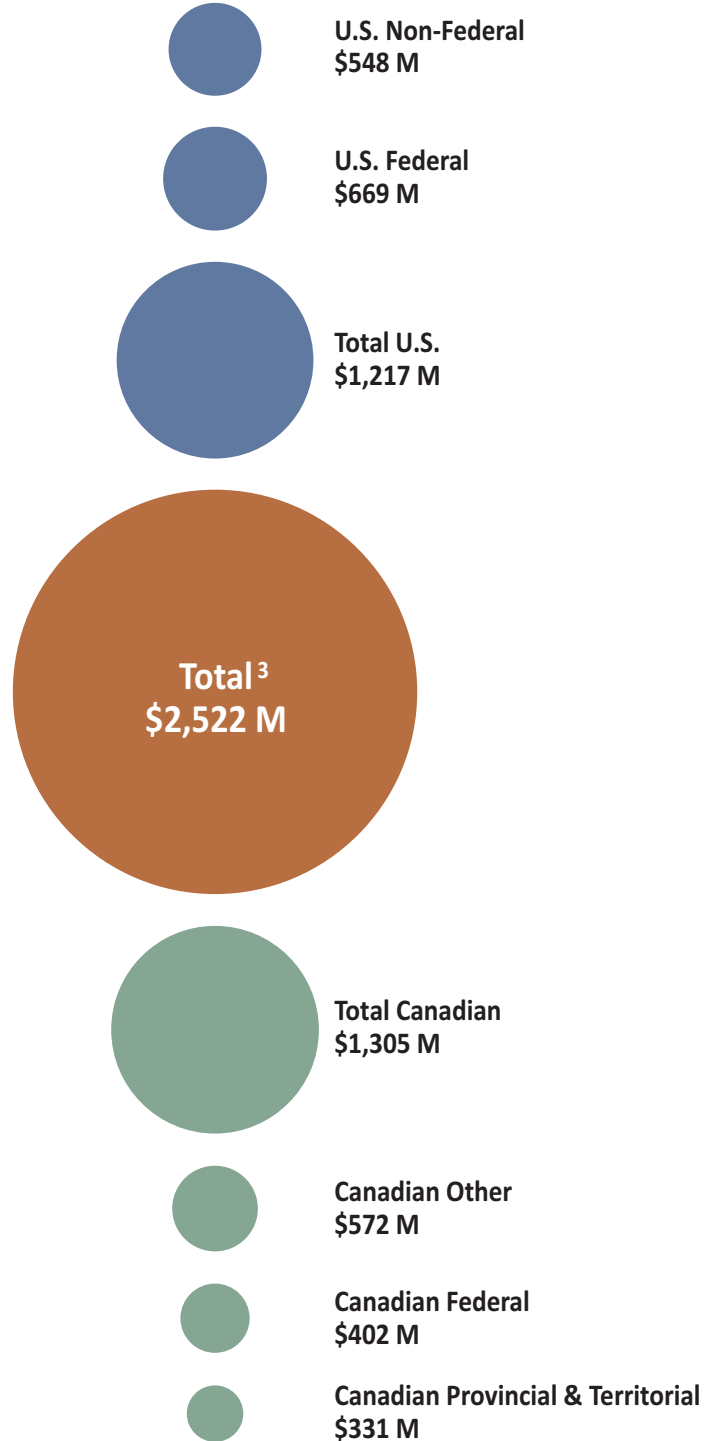
- 1 Coordination, communication, policy and crop damage
- 2 Banding, survey and research

The successful implementation of Canada's NAWMP program has been enabled by the continuous support of partners in both Canada and the United States, including federal, provincial/territorial and state governments, non-governmental organizations and individuals. In particular, funding received under the United States' 1989 *North American Wetlands Conservation Act* has been integral to the success and longevity of the Canadian program.

1986-2019 consists of the January 1, 1986 to March 31, 2019 time frame.
2018-2019 consists of the April 1, 2018 to March 31, 2019 time frame.

Contributions

In support of the NAWMP in Canada 1986 to 2019
(\$2,522 M CAD)



³ Includes \$0.24 M in international contributions



North American Wetlands Conservation Act: Celebrating 30 Years of Success

Northern Pintail.
Lily Campbell

The year 1989 saw some environmental catastrophes, both anthropogenic and natural, such as the Exxon Valdez oil spill and the San Francisco earthquake. At the same time, worldwide consultations were being initiated, leading to the Rio Earth Summit in 1992 where all nations present accepted without change the Rio Declaration, a non-binding statement of broad principles for environmental policy. Also taking flight was the *North American Wetlands Conservation Act* (NAWCA), which was approved by the U.S. Congress and passed into law on December 13, 1989.

The objective for NAWCA was to provide both funding and administrative direction for the then three-year-old North American Waterfowl Management Plan (NAWMP) between Canada and the United States. Mexico joined NAWMP in 1994. A major impetus to NAWCA was a protracted drought in the 1980s that severely compromised waterfowl habitats. Furthermore, wetlands were being filled in and converted to other land uses. As a result, some waterfowl species had declined significantly in just over a decade. For example, from 1970 to 1985, the breeding population of Blue-winged Teal declined by 1.5 million birds, and the populations of Mallard and Pintail declined by 3.2 million and 3.4 million birds respectively.

NAWCA has been a steadfast pillar for wetland conservation in North America and a model for international cooperation.

Since its inception, NAWCA has been a steadfast pillar for wetland conservation in North America and a model for international cooperation. The overarching goal for NAWMP and NAWCA has been clear: bring waterfowl populations in North America back to the numbers observed in the 1970s. In three decades, much has been accomplished toward this goal with approximately 30 million acres (12 million hectares) of wetland habitat in North America (in all 50 states, across Canada and in areas of Mexico) benefitting from NAWCA funding. Achieving this impressive

Sunset in Cains Mountain, Cape Breton, Nova Scotia.
Irwin Barrett, Nature Conservancy of Canada



figure has involved all levels of government, conservation organizations, industries and thousands of private landowners. The NAWMP is considered one of the most successful conservation initiatives in the world.

On May 6, 2019, NAWCA's 30th anniversary was celebrated in a commemorative banquet with more than 700 guests at an annual Ducks Unlimited event on Capitol Hill, Washington, D.C. The gathering recognized the extraordinary value that has resulted from cross-border efforts to protect migratory waterfowl, not just for birds and bird enthusiasts but for local economies. NAWCA's investment in Canada has been significant at more than \$600 million. The wetlands and other habitats that have been secured and enhanced within Canada as a result of this investment cover a collective area of about 26 million acres (10.5 million hectares).

Canada and its wetland habitats have played and will always play a critical role in waterfowl population health, as well as for other wetland-dependent wildlife species, including species listed in Canada as being at risk, such as the Western Chorus Frog, the Bank Swallow and the Spotted Turtle. Wetlands also provide vital ecosystem services such as water filtration, flood and drought control, protecting communities from storm surges, storage of greenhouse gases, and places for recreation and connecting with nature. Wetlands cover approximately 13% of land in Canada and are present in every biome from the tundra to the coast and those in between. Together Canada's diverse wetlands make up approximately 25% of the world's remaining wetlands. Even so, with human

populations growing and demands for living space, food, water and energy increasing, the once-abundant wetlands in southern Canada have been compromised in quantity and quality. In southern Ontario, 68% of the original wetlands have been converted from their natural state to support other uses. Similarly, about 75% of southwestern Manitoba's original prairie pothole wetlands no longer exist. In the North, however, most wetlands are intact. The vast boreal forest region extending across Canada and Alaska contains a remarkable 35% of the world's wetlands with as many as 12–14 million ducks breeding in this region.

The recently updated report *State of Canada's Birds 2019* reveals that waterfowl populations continue to recover, having increased by 150% in Canada since 1970. This is a remarkable achievement compared with other migratory bird species' declining populations. This evidence of rebounding populations is testament to the tremendous investment of funds, partnerships and science into wetland habitat work in Canada. Together, Canada, the United States and Mexico have come far in joint efforts to restore and conserve environments where waterfowl and all wetland-dependent species can thrive. As the world faces new and increasingly urgent environmental issues, this type of collaborative work must go on and, if anything, increase.

Habitat Joint Ventures

Miscou, New Brunswick.

Mike Dembeck, Nature Conservancy of Canada

The Canadian portions of the Habitat Joint Ventures integrate planning, science, governance, partnerships and management to achieve NAWMP goals in Canada through a programmatic approach. A science-based Implementation Plan is created to address local, regional and continental goals. Joint Venture partners actively research, monitor and evaluate waterfowl populations and deliver habitat conservation programs at a regional level.



Eastern Habitat Joint Venture

Green-winged Teal.

Brian Wolitski, Ducks Unlimited Canada



www.ehjv.ca
www.ehjv.ca/fr

The EHJV contains 780 million acres (315 million hectares) spanning Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island and Newfoundland and Labrador. The EHJV supports 30% of Canada's wetlands, including more than 120 million acres (48 million hectares) of freshwater and tidal wetlands. Important habitats include coastal bays and salt marshes, lakeshore marshes, floodplain wetlands and boreal forest wetlands. The EHJV has 13 priority waterfowl species including American Black Duck, Mallard, Ring-necked Duck, Common Goldeneye, Common Eider (three races), Green-winged Teal and Canada Goose (five populations). The habitat within the EHJV supports 95% of the continental population of American Black Duck and 80% of the southern race of Common Eider. The Atlantic and North Atlantic populations of Canada Goose breed exclusively within the EHJV.

In 1989, the Eastern Habitat Joint Venture (EHJV), Canada's largest joint venture, began with a single project in Matchedash Bay, Ontario. The goal was to conserve important habitat for declining waterfowl populations. Thirty years later, over \$592 million have been invested to secure 2 million acres (840,000 hectares) across Canada's six eastern provinces to conserve high-priority wetlands for all migratory birds, other wildlife and communities across the landscape. EHJV partners include Environment and Climate Change Canada, the Nature Conservancy of Canada (NCC), Ducks Unlimited Canada (DUC), Wildlife Habitat Canada, Bird Studies Canada and the provincial governments.

Over the past 30 years, DUC and the EHJV partnership have successfully collaborated on waterfowl habitat conservation that has been further strengthened by the clear link between waterfowl in eastern Canada and birds harvested along the Atlantic and Mississippi Flyways. EHJV accomplishments are possible thanks to generous support from many funding partners, some of which are highlighted here.

The States Contributions to Canada Program has resulted in over US\$85 million invested into EHJV waterfowl breeding grounds.

States Contributions to Canada Program

Together with EHJV partners, DUC and Ducks Unlimited (DU) seek support from individual states within the Mississippi and Atlantic Flyways to meet the habitat challenges facing our shared waterfowl resource. Since its inception in 1965, the States Contributions to Canada Program has provided over US\$11 million toward conservation efforts in Canada, and with leveraging, the contributions have resulted in over US\$85 million invested into EHJV waterfowl breeding grounds. The States Contributions to Canada Program provides non-federal funding from state agencies that is matched by DU and matched again by federal funding through the *North American Wetlands Conservation Act (NAWCA)*. Finally, the funds are leveraged by Canadian funding partners. Currently, 19 states contribute non-federal funding of more than US\$625,000 annually to the EHJV.

American Friends of Canadian Nature



Musquash Estuary nature reserve, New Brunswick.
Mike Dembeck, Nature Conservancy of Canada

Formerly known as American Friends of the Nature Conservancy of Canada, American Friends of Canadian Nature (AFCN) is a U.S. charity that supports land conservation in Canada through cross-border strategies. Similarly to the States Contributions to Canada Program, U.S. contributions to AFCN can provide the non-federal match required for NAWCA funding and are further leveraged in Canada by the Nature Conservancy of Canada (NCC)—a \$1 donation to AFCN can provide \$4 for conservation in Canada.

Donations to AFCN contribute to the securement, enhancement and management of key waterfowl habitat in Canada. Recently, AFCN contributed to protecting the Musquash Estuary nature reserve surrounding New Brunswick's Musquash Estuary Marine Protected Area. To date, the NCC has conserved over 5,500 acres (2,225 hectares) of wetland and associated upland habitat in the Musquash Estuary reserve, with support from AFCN, the Government of Canada's Natural Areas Conservation Program and Ecological Gifts Program, the Government of New Brunswick and the U.S. Fish and Wildlife Service through NAWCA, along with support from many foundations and individuals.

This reserve surrounds one of the Bay of Fundy's last thriving river estuaries and encompasses important habitat for numerous waterfowl and shorebird species, including American Black Duck, Common Eider, scoters, Black Guillemot, Common Loon, Purple Sandpiper and Semipalmated Sandpiper. The estuary's expansive coastal marshes, mudflats and rocky shores support migratory birds, particularly during the fall migration.

The States Contributions to Canada Program helps DUC advance EHJV's conservation goals by providing much-needed funding to conserve habitat in the critical breeding grounds for birds in these flyways. Each state benefits from conservation of breeding ground habitats: the birds produced in these habitats migrate through the participating states, ensuring healthy fall flights of waterfowl for birders and hunters. The birds then also winter in many of these states. North Carolina, in particular, has a strong connection with DUC's Atlantic Canada conservation work.



Aulac Marsh, New Brunswick.
Ducks Unlimited Canada

North Carolina Wildlife Resource Commission

North Carolina Wildlife Resource Commission (NCWRC) has funded DUC's efforts to conserve and restore waterfowl habitats in Canada since 1969. In 1972, NCWRC funded a restoration project at New Brunswick's Aulac Marsh, which today is a sanctuary for numerous species of migrating and breeding waterfowl including Ruddy Ducks, Pintails, Green-winged Teal, American Black Ducks, Gadwall, American Wigeon, Ring-necked Ducks, Grebes and Common and Red-breasted Mergansers. The partnership between DUC and NCWRC has continued annually with funds going toward local projects across the Maritimes.

DUC dedicated Cameron's Marsh near Heather Beach, Nova Scotia, in 2006 in honour of NCWRC and North Carolina's waterfowlers. Shortly after, the NCWRC committed to providing US\$500,000 over 10 years to (1) restore wetlands in agricultural landscapes in partnership with local farmers and (2) fund DUC's long-term maintenance program to ensure wetland productivity. The NCWRC was the first state agency to sign a 10-year contribution agreement with DUC for the conservation of wetlands in Canada. In 2017, the agreement was renewed for another 10 years to include long-term habitat securement, wetland restoration/rebuilds and wetland maintenance.

Saint John River floodplain

Each spring, the Saint John River in New Brunswick swells with floodwater from melted snowpack. Some years, this water spills over its banks damaging highways, farmland, city streets and homes. The occurrence and severity of flooding along the Saint John River is expected to get worse with extreme weather events increasing in frequency as a consequence of climate change. Wetlands are such effective eco-workhorses, sponging up excess water and acting as a buffer along shorelines, that the Insurance Bureau of Canada and the University of Waterloo's Intact Centre on Climate Adaptation released a report in September 2018, informed in part by DUC research, urging governments to use wetlands as natural urban infrastructure in response to extreme weather events associated with climate change.

American Black Duck.
Claude Ponthieux, Ducks Unlimited Canada





An excavator working at Hazlett's Marsh, New Brunswick.

Ducks Unlimited Canada

DUC started restoring wetlands in the Saint John River area in the 1970s to help reverse historical loss and to provide more habitat for waterfowl. In fall 2018, NCWRC committed to sending a portion of their Pittman-Robertson fund allocation (from the *Federal Aid in Wildlife Restoration Act*) for wetland rebuilds in the Lower Saint John River floodplain and for wetland restoration within other communities in Atlantic Canada. The annual US\$116,000 contribution is matched by DUC and other EHJV partners locally and will result in more than 1,000 acres (400 hectares) restored along the Saint John River floodplain. Today, marshes make up 13% of the river's floodplain and 40% of the river's 50,000 acres (20,000 hectares) of floodplain wetlands.

Hazlett's Marsh dedication

DUC recently dedicated another wetland to the NCWRC and North Carolina's waterfowlers: Hazlett's Marsh, near Fredericton, New Brunswick. This was one of five projects funded by Pittman-Robertson funds, resulting in 193 acres (78 hectares) restored throughout New Brunswick and Prince Edward Island. "Being able to participate in the Hazlett's Marsh dedication, the first project anywhere in Canada to be funded using U.S. Pittman-Robertson Funds, was the culmination of the site events," said Dr. David Cobb, Director of Research at NCWRC.

Ten delegates from North Carolina, a DU representative from South Carolina, local landowners Bev and Pauline Hazlett and their family, EHJV Coordinator Tania Morais and DUC staff were on site for the dedication. "This 50-year-plus partnership with North Carolina is critical to helping DUC conserve wetland habitat across the Atlantic provinces," said Mark Gloutney, DUC's Director of Eastern Regional Operations. "North Carolina's commitment to healthy wetlands across the continent helps ensure there's healthy habitat for waterfowl and wildlife for years to come."

At the dedication, DUC and EHJV partners showcased all the on-the-ground accomplishments achieved with support from NCWRC and celebrated a partnership spanning decades and thousands of miles. "Seeing the first project secured with funds from North Carolina in 1972 and the most recent projects were unique bookends to the tour," said Cobb.

North Carolina's investments in Atlantic Canada have made a significant difference in conserving and restoring critical waterfowl habitat.



The dedication of Hazlett's Marsh.
Ducks Unlimited Canada

NCWRC's investments in Atlantic Canada have made and will continue to make a significant difference in conserving and restoring critical waterfowl habitat. With contributions to date of more than US\$1.1 million, leveraged funds come to approximately US\$8.5 million, resulting in more than 6,500 acres (2,630 hectares) of waterfowl habitat conserved.



The successful, long-term partnerships between Canadian and American organizations and agencies in the EHJV demonstrate that, like migratory birds, wetland conservation is borderless.

For more information, contact Tania Morais,
 Eastern Habitat Joint Venture Coordinator,
 (506) 364-5085, tania.morais@canada.ca.

**Eastern Habitat Joint Venture
 Contributions (CAD)**

	2018-2019	Total (1986-2019)*
Total	20,953,032	606,515,708

Accomplishments (Acres)

	2018-2019	Total (1986-2019)*
Secured	13,297	2,083,266
Enhanced	14,788	675,936
Influenced	358,655	77,767,815

Secured and enhanced acres are not additive.

2018-2019 consists of the April 1, 2018 to March 31, 2019 time frame.

1986-2019 consists of the January 1, 1986 to March 31, 2019 time frame.

* Includes first-step projects completed from 1986-1988 before the formal recognition of the EHJV in 1989.



Hazlett's Marsh.
Tania Morais

Northern Shoveler.

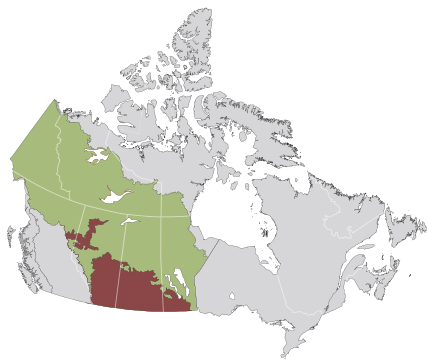
Liam Ragan





Prairie Habitat Joint Venture

Mallard drake in flight.
Ducks Unlimited Canada



www.phjv.ca

The PHJV encompasses 158.4 million acres (64.1 million hectares) of prairie and aspen parklands in Alberta, Saskatchewan, Manitoba and the Peace Parkland Region of British Columbia. The PHJV also supports conservation in the western boreal forest (WBF), which covers parts of British Columbia, Alberta, Saskatchewan, Manitoba, Yukon and Northwest Territories. The PHJV contains a range of wetland types from small potholes to marshes and bog systems.

Together, the Prairie Parklands and WBF regions of Canada provide habitat for most North American duck species. They also provide habitat for hundreds of priority species identified during the Bird Conservation Region planning process. For example, the WBF has 57 priority species of non-game birds and 30 boreal specialists. Linkages among habitats and species are highlighted in the Prairie Parklands and WBF Implementation Plans.

The large, diverse area within the Prairie Habitat Joint Venture (PHJV) provides highly productive habitats for waterfowl and other birds. The Joint Venture continued this year to undertake a wide variety of proven longstanding programs and also engaged in innovative approaches to conservation that deliver cost-effective, landscape-scale results. Several of these approaches are highlighted below.

Prairie Parklands

Saskatchewan: Innovation to address the cost of conservation

Western landscapes are major economic drivers for Canada, but the Prairie Pothole Region is also essential to waterfowl and wildlife. Some of the PHJV's priority landscapes are in Saskatchewan, including the Allan Hills and Dana Hills regions, where as many as 60 waterfowl pairs breed per square mile (96 pairs per square km). Habitat conservation has been underway in Saskatchewan for more than 75 years and much has been accomplished for waterfowl, other wildlife and people.



A conservation easement property in the Allan Hills, Saskatchewan.

Branimir Gjetvaj

The Revolving Land Conservation Program promotes sustainable industry practices while acknowledging that a working landscape can deliver essential environmental benefits.

Historically, conservation work was affordable because habitat on rural land was available at low cost, but with a strengthening agricultural economy and high land values in neighbouring provinces, Saskatchewan land values have risen to more than \$1,000/acre (\$400/hectare). As a result, innovation has become essential to protecting habitat.

Ducks Unlimited Canada (DUC) has a Revolving Land Conservation Program (RLCP), which borrows funds at low or 0% interest to purchase land, restore it if applicable and then sell the land back to producers with a conservation easement on the title to conserve waterfowl habitat. The program also creates opportunities for restoring drained wetlands and converting cropland to duck nest-friendly perennial cover, opportunities that may not have been possible under private ownership. The RLCP's innovative approach engages Prairie landowners and other partners to fuel a perpetual cycle of conservation and protects more at-risk land area in the short term. From April 2018 to March 2019, the program revolved 3,000 acres (1,200 hectares) of perpetually protected habitat in ten projects.

The success of the RLCP has attracted a \$1 million investment by Pembina Pipeline Corporation. With these funds, DUC plans to conserve approximately 2,000 acres (800 hectares) of important wetland and grassland habitat in key waterfowl-producing areas of Alberta and Saskatchewan. As well as leveraging funds for conservation today and for years to come, the revolving model promotes sustainable industry practices while acknowledging that a working landscape can deliver essential environmental benefits.

Alberta: Watershed Resiliency and Restoration Program

In spring 2013, southern Alberta experienced devastating floods with millions of dollars in damage. The provincial government responded with funding for flood recovery and prevention, including the \$32.5 million Watershed Resiliency and Restoration Program (WRRP). As its name implies, the WRRP aims to improve watershed functions to build greater long-term resiliency to droughts and floods.

The WRRP and PHJV partner with landowners to find solutions that work for both the individual landowner and waterfowl habitat. Ross Armstrong, a southern Alberta rancher, engaged with DUC to restore eight previously drained wetlands and, by doing so, increased the amount of waterfowl habitat and the number of water sources for his cattle. "That makes a big difference, especially out on the prairie where there often isn't much water," explained Ross Armstrong. "Depending on how much rain and snowmelt there is, some of the small, shallow wetland basins can hold one or two feet of water at times."

From 2015 to 2018, WRRP funds allowed DUC to restore an additional 1,765 acres (715 hectares) of wetlands across a variety of watersheds in Alberta, increasing the amount of waterfowl and wildlife habitat. Healthy, productive pothole wetlands with a mix of plants and open water are a critical source of food for ducks and their broods.

Marsh Riparian Fencing and EnvironSpan Installation project as part of the Watershed Resiliency and Restoration Program in Alberta.

Carys Richards, Nature Conservancy of Canada



Nature Conservancy of Canada (NCC) and Alberta Conservation Association led another cooperative WRRP program to protect 48.8 acres (19.7 hectares) of riparian area around Little Crooked Creek near Waterton Lakes National Park. Using culvert installation, fencing and adaptive management grazing practices, the project excludes approximately 220 cow–calf pairs annually to protect sensitive creekside vegetation from compaction and erosion. Healthy riparian zones provide habitat for native fish species, improve water quality downstream, improve water retention and absorption capabilities during flooding and enhance resiliency to drought.

Manitoba: Protecting wetlands through conservation easements

Wetlands and grasslands have disappeared at an alarming rate in settled areas of Manitoba, and rising land value in recent years has increased loss of, and degradation risk to, remaining habitat. Conservation programming by PHJV partners in Manitoba is helping to mitigate habitat loss through landowner partnerships that encourage protection and restoration of waterfowl habitat.

A core initiative of PHJV partners, including DUC, the Manitoba Habitat Heritage Corporation (MHHC) and NCC, is the Conservation Easement program, which provides landowners a one-time lump sum payment if they agree not to break or drain wetlands or surrounding habitat. The easement is permanent, remaining even if the land is sold, but there's flexibility to allow for haying, grazing and cultivation of certain wetlands during dry periods. Complementing this program is a land purchase or donation program where a PHJV partner takes full ownership of the property and manages it for the benefit of wildlife and waterfowl, often using land-management practices employed by private landowners such as planting perennial cover.

Over the past 30 years, easement delivery in Manitoba has been strong. To date, PHJV partners have permanently protected 168,070 acres (68,016 hectares) through easements. A growing number of landowners are signing conservation easements; last year alone, more than 40 signed up and protected about 9,500 acres (3,845 hectares) of habitat. While variable, the average landowner payment for a conservation

Tom and Valerie Northam next to a wetland on their property in Manitoba.

Ducks Unlimited Canada





A wetland restored in southwestern Manitoba.
 Mark Francis, Ducks Unlimited Canada

easement was \$92,000 in 2018, and incentives are greater if restoration is done with a conservation easement.

Among recent landowners to access programs are the Northams, who are restoring eight wetlands covering more than 9 acres (3.6 hectares) as part of a conservation easement. They'll permanently protect another 20 basins and preserve some grassland where their livestock graze. Tom Northam said their conservation easement strikes the right balance between nature and agriculture. "You're protecting the wetlands for the future, and it provides income."

Western Boreal Forest

Historic expansion of Alberta's boreal protected areas

In spring 2018, the protection of Alberta's boreal habitat took a momentous step forward with the establishment of 3.4 million acres (1.4 million hectares) of new protected lands. With this addition to existing federal and provincial parks, Alberta now has the largest contiguous protected boreal forest area in the world, all the more impressive considering almost a third of the world's boreal zone lies within Canada. This vast protected area—16.5 million acres (6.7 million hectares) in total—

Alberta now has the largest contiguous protected boreal forest area in the world ... ensuring protection of countless boreal wetlands that provide habitat for migratory waterfowl and other wildlife.



Birch River Wildland Provincial Park, Alberta, is a haven for 68 species of conservation concern, including three that are listed under the federal *Species at Risk Act*—Peregrine Falcon (special concern), Wood Bison (threatened) and Woodland Caribou (threatened).

Michel Rapinski, Nature Conservancy of Canada

Lesser Scaup pair in courtship.
Ducks Unlimited Canada



ensures protection of countless boreal wetlands that provide habitat for migratory waterfowl and other wildlife.

Partner agencies of Alberta NAWMP, particularly NCC and Alberta Environment and Parks (AEP), were part of the major collaborative efforts involved in creating these new protected lands, which consist of five new or expanded parks: Birch River, Dillon River, Kazan, Richardson and Birch Mountains Wildland Provincial Parks (WPPs). Additional funds were provided for these parks by the Natural Areas Conservation Program, a unique partnership between NCC and Environment and Climate Change Canada (ECCC).

More recently, an additional park, the Kitaskino Nuwenëné Wildland Provincial Park was created through contributions by AEP, ECCC’s Nature Fund, Mikisew Cree First Nation and industry. This park protects an additional 400,000 acres (161,880 hectares) of boreal habitat in Alberta.

Travis Ripley, Executive Director of AEP’s Fish and Wildlife Policy Branch and chair of the Alberta NAWMP Board explained what was involved in creating the parks, which emerged from Lower Athabasca Regional Plan recommendations. “Such a big change took a lot of years and the support of the First Nation communities, various industries and the environmental non-governmental organizations to make it all work,” he explained. “We needed the strength of every stakeholder to make this effort the success it was. ...It highlights what can be accomplished at a very large scale with a collaborative attitude.”

The new boreal protected areas are exciting for Alberta NAWMP, which has recently broadened its scope beyond Alberta’s Prairie and Parkland regions to encompass the province’s Boreal Forest Region. “The boreal protected areas are hugely beneficial to the Alberta NAWMP Partnership because of the large number of wetlands they include,” said Carys Richards, Alberta Communications Manager with NCC. “Billions of birds need Canada’s boreal forest as a critical breeding ground, including waterfowl, shorebirds, songbirds and raptors.” As well, she noted that Canada’s Boreal Forest Region performs other ecosystem services such as being a significant source of fresh water and a major carbon sink.

By coupling a multi-stakeholder approach with a strong understanding of the immense value of boreal landscapes, Alberta has set a powerful example for the way forward on boreal conservation.

For more information, contact Deanna Dixon, Prairie Habitat Joint Venture Coordinator, (780) 951-8652, deanna.dixon@canada.ca.

Prairie Habitat Joint Venture – Prairie Parklands Contributions (CAD)

	2018-2019	Total (1986-2019)
Total	49,019,031	1,339,932,326

Accomplishments (Acres)

	2018-2019	Total (1986-2019)
Secured	533,313	8,142,299
Enhanced	315,537	2,395,683
Influenced		6,267,088

Secured and enhanced acres are not additive.

2018-2019 consists of the April 1, 2018 to March 31, 2019 time frame.

1986-2019 consists of the January 1, 1986 to March 31, 2019 time frame.

Prairie Habitat Joint Venture – Western Boreal Forest Contributions (CAD)

	2018-2019	Total (1986-2019)
Total	4,129,109	150,385,602

Accomplishments (Acres)

	2018-2019	Total (1986-2019)
Secured		12,091,184
Enhanced		107
Influenced		76,216,853

Secured and enhanced acres are not additive.

2018-2019 consists of the April 1, 2018 to March 31, 2019 time frame.

1986-2019 consists of the January 1, 1986 to March 31, 2019 time frame.



Canadian Intermountain Joint Venture

Barrow's Goldeneye pair.
Ducks Unlimited Canada



www.cijv.ca

With an area of 123.5 million acres (50 million hectares), the CIJV covers portions of British Columbia and Alberta. The CIJV encompasses a diverse landscape of grasslands, dry and moist coniferous forests, riparian areas and wetlands, alpine tundra and even pocket desert, with 24 breeding waterfowl species. The Joint Venture's estimated 1.45 million birds represent 70% of British Columbia's and roughly 4% of Canada's breeding waterfowl population. The CIJV supports roughly one quarter of the world's breeding population of Barrow's Goldeneye, along with significant breeding populations of Mallard, Hooded Merganser and Ruddy Duck.

The Canadian Intermountain Joint Venture (CIJV) is the youngest of all the Canadian Joint Ventures. Established in 2003, it was the first truly "all-bird" Joint Venture. Although less than 10% of the CIJV is wetlands, lakes and other water features, these areas are all incredibly important. For example, two of Canada's 37 Ramsar sites (Creston Valley and Columbia Wetlands) rest within the CIJV. The most productive wetlands are found in fertile floodplain valley bottoms and grassland plateaus at mid and low elevations, and they are the CIJV areas most threatened by climate change and landscape-level habitat alterations. Humans are also a significant threat in this area of British Columbia (B.C.), due to the suitability of low-lying areas to settlement and agriculture. Areas of focus for the Joint Venture are wetlands, grasslands and riparian areas, as well as lakes, rivers and streams. Stewardship and restoration have been the major themes in the CIJV for 2018–2019.

Working with the ranching community

The CIJV has had excellent engagement from the ranching community, the largest industry in the area with the greatest use of bird habitat. The B.C. Cattlemen's Association is a CIJV partner and worked with Environment and Climate Change Canada (ECCC) to deliver Species at Risk Partnerships on Agricultural Lands (SARPAL), an industry-led stewardship program to conserve habitat on farmlands for species

listed in Canada as being at risk, with Lewis's Woodpecker and Yellow-breasted Chat as the focus. In 2018–2019, the SARPAL program worked with ranchers to complete four on-farm projects. In total, 37 acres (15 hectares) of riparian habitat and 100 acres (40 hectares) of grassland habitat were restored and conserved on private ranchlands for Lewis's Woodpecker and other associated wildlife.

In another initiative, the San Francisco Bay, Central Valley, Pacific Birds, Intermountain West and Canadian Intermountain Joint Ventures have all expressed interest in sharing data and tracking Long-billed Curlews that travel between their respective areas. For example, some tracked curlews have been tagged in the CIJV and are spending winters in the Central Valley Joint Venture. The CIJV is extending information to ranchers on how to use the Cornell Lab of Ornithology's eBird, which is an online tool for individuals to be able to contribute bird-sighting information. The CIJV is encouraging ranchers to report curlew sightings on their properties and is also planning to host eBird workshops through its partners for ranchers to increase engagement and citizen science reporting about the birds using their lands.

Bird Studies Canada has been continuing its work with farmers and ranchers in the Prince George area to locate nesting curlews on hay fields and pastures. This season, with researchers from Boise State University in Idaho, they located 14 nests and are tracking the birds' survival rates. Satellite tags have been attached to seven adults to determine migration movements and non-breeding season distribution of birds at these most northerly breeding sites for the species. Relationship building with the ranching community has been a focus of the CIJV and its partners, and as a result, rancher interest and investment with curlews in particular have been high. Karen Kellett, a rancher near Prince George, named one curlew captured on her property after her late son, Peter. Peter successfully nested on her property this year, and the Kelletts are eager to learn about the bird's movements during migration and wintering. They hope Peter will be back to nest again next year.



Dr. Jay Carlisle from Boise State University's Intermountain Bird Observatory with Jean the Curlew, tagged on the Kellett family farm near Prince George, British Columbia.

Karen Kellett



Ted Haywood, farmer of Indian Garden Ranch in Savona, British Columbia, participated in the B.C. Cattlemen's Association's Species at Risk Partnerships on Agricultural Land (SARPAL) program.

B. France

Relationship building with the ranching community has been a focus of the CIJV, and as a result, rancher interest and investment with curlews in particular has been high.



An aerial view of the re-created Cherry Meadows wetlands, near Kimberley, British Columbia.
Nature Conservancy of Canada

Enhancing wetland habitat values

The Cariboo–Chilcotin Conservation Areas’ Enhancement Project, initiated in 2013, has been fencing sensitive habitat areas to prevent livestock trespass into wetlands and maintain habitat values for fish and wildlife in central British Columbia. In 2018–2019, with funding support from ECCC, Ducks Unlimited Canada (DUC), the Province of British Columbia and Wildlife Habitat Canada, the project installed 3 miles (4.8 km) of livestock exclusion fencing to protect and enhance 1,975 acres (800 hectares) of wetland and associated upland habitat. The main fencing project this year was at Chilcotin Lake, and it will greatly reduce the impact of livestock grazing at this important conservation area, improving habitat integrity and values for a wide range of wildlife species. This work is a key component in sustaining waterfowl populations in the Cariboo–Chilcotin region.

During the summer of 2017, wildfires halted restoration activity at The Nature Trust of British Columbia’s Bummers Flats–Cherry Creek Conservation Complex and delayed completion of the second year of work on a three-year project. With ECCC funding, 52 acres (21.2 hectares) of wetlands were restored and enhanced at the

conservation property from 2016–2018, all without structures that require maintenance. Astonishingly, the wetlands are already experiencing significant use by waterfowl, Great Blue Herons, Kingfishers and Sandhill Cranes, as well as by other wildlife such as Grizzly Bear, Black Bear, Western Toad, Columbia Spotted Frog, elk, deer and muskrat. The wetlands are also becoming well-established with wetland plants, including *Sagittaria* spp., which is an important food source for waterfowl. Several small fenced enclosures were built in year 2 and planted with shrubs and trees to re-establish wildlife cover next to the wetlands in large openings that had been cleared for farming in the past. The wetlands, which are naturally supplied with water from springs, rainfall, snowmelt and Kootenay River floodwaters, will provide habitat for wildlife, recharge groundwater, clean surface water and add beauty to the landscape for decades and perhaps centuries to come.

View from the Latters’ home of the restored Cherry Meadows wetlands.

Carol Latter, Nature Conservancy of Canada



At Cherry Meadows, near Kimberley, B.C., a project led by Nature Conservancy of Canada continued work to re-create 40 acres (16 hectares) of wetlands that had been drained for hay fields and later abandoned. Here, the reconstructed wetland complex was also built without water control structures so it can be maintenance-free. While wetland specialists designed and led the project, which includes emergent, ephemeral and wet-meadow wetlands, a significant amount of volunteer time was put in by Carol and Walter Latter, whose home overlooks the wetlands now on their former property. On wetlands restored during the first phase of the project, reported last year, numerous species have already been observed, including Mallards, Ruddy Ducks, Canada Geese and other waterfowl, as well as Sandhill Cranes, Ospreys, Bald Eagles and various mammals.

Identifying priority grasslands for conservation within the Cariboo–Chilcotin region

Grasslands in British Columbia’s Cariboo–Chilcotin region contain small wetlands that were designated in 2012 by the North American Waterfowl Management Plan (NAWMP) as being continentally significant for waterfowl in the Central Plateau. They are also within the Waterfowl Priority Area in the CIJV Implementation Plan, because of wetland density, risk and/or degree of habitat loss, and partnership opportunity. In 2019 the Grasslands Conservation Council worked with local experts to identify the highest priority grasslands in the Cariboo–Chilcotin region for conservation due to rarity and threat, and the resulting information will guide conservation investments by Joint Venture partners in the region. The wetlands within these grassland areas are under increasing threat due to climate change, extensive forest fires and human disturbance, so this information can guide partners and funders in targeting conservation dollars. This area is of particular importance to Barrow’s Goldeneye, with up to 20% of the global population nesting in the region.

For more information, contact Andrew Huang, Canadian Intermountain Joint Venture Coordinator, (604) 350-1913, andrew.huang@canada.ca.

Canadian Intermountain Joint Venture Contributions (CAD)

	2018-2019	Total (2003-2019)
Total	3,125,617	88,204,060

Accomplishments (Acres)

	2018-2019	Total (2003-2019)
Secured	1,869	360,638
Enhanced	1,974	202,716
Influenced		50,906

Secured and enhanced acres are not additive.

2018-2019 consists of the April 1, 2018 to March 31, 2019 time frame.

2003-2019 consists of the January 1, 2003 to March 31, 2019 time frame.



Becher’s Prairie in the Cariboo–Chilcotin region, British Columbia.

Katharine Vanspall



Pacific Birds Habitat Joint Venture

American Wigeon.

Graham Sorenson



www.pacificbirds.org

The PBHJV is an international Joint Venture that includes portions of British Columbia (B.C.), Alaska, Washington, Oregon, California and Hawaii. The B.C. coastline has over 440 estuaries, which are a focus of many PBHJV programs due to their food-rich combination of tidal wetlands and adjacent floodplains. Near urbanized areas, floodplains have often been highly modified and converted to intensive non-forage agricultural crops, resulting in the loss of considerable natural habitat and food supply. Throughout the PBHJV, 40 species of ducks, swans and geese occur regularly at various stages of their life cycles, and an estimated one million waterfowl winter along the B.C. coast. The Fraser River Delta in southern British Columbia supports the highest density of wintering waterfowl in Canada. Key species in the B.C. portion of the Joint Venture include the Wrangel Island Snow Goose (nearly half the population), the Pacific Coast's Trumpeter Swan (half the population), American Wigeon, Cackling Goose and Western High Arctic Brant.

The Pacific Birds Habitat Joint Venture (PBHJV) has a history going back more than thirty years. Its origins lie with the Pacific Estuary Conservation Program (PECP), created in 1987 as a partnership of non-governmental and governmental organizations that had been pooling resources and securing estuaries along the British Columbia (B.C.) coast. Within only a few years, in 1991, the Pacific Coast Joint Venture (PCJV) was created. This international Joint Venture—the first of its kind—brought together six U.S. Joint Ventures, two Canadian Habitat Joint Ventures and two Species Joint Ventures. The PECP was embedded as a group within the newly formed PCJV and continued to secure estuaries on private and public lands. It has become one of the most successful coastal habitat conservation programs in Canada.

Together, the PECP and PCJV mapped and ranked 442 estuaries along the B.C. coastline, creating a scientifically rigorous roadmap for estuary conservation. Several of the PECP-acquired properties are now managed by the South Coast and West Coast Conservation

An aerial view of the Fraser River estuary.

Jocelyn Demers



Land Management Programs (SCCLMP and WCCLMP), while the original PECP partners still work cooperatively to secure more high-priority sites through other established programs or independently. They focus on creating new, expanded partnerships to manage and restore secured coastal habitats and to secure additional estuaries and other habitats. Environment and Climate Change Canada (ECCC) has supported these activities using North American Waterfowl Management Plan (NAWMP) funds.

Over the years, the PCJV expanded its habitat scope and geographic focus to cover the west coast from northern California to Alaska as well as the Pacific Islands, and it also changed its name in 2015 to the Pacific Birds Habitat Joint Venture (PBHJV or Pacific Birds). What has remained consistent is the Joint Venture's delivery of the NAWMP and its work conserving habitat for wintering waterfowl in British Columbia. Two locations that have continued to receive substantial attention during the past year are the Fraser River Estuary and wetlands on Vancouver Island.

Focus on the Fraser River Estuary

Increasingly urgent threats to bird habitat

In 2018, the international PBHJV Board agreed that the Fraser River Estuary, an Important Bird and Biodiversity Area, a Ramsar site and a site continentally significant to waterfowl, is a focus of the international PBHJV and its Coastal Estuary Program. The values this area holds for wintering waterfowl are tremendous, and the threats are increasing.

Soil-based agricultural lands, which replaced estuary habitats long ago but provided replacement forage for wintering and migrating waterfowl and shorebirds, are being lost at a rapid rate to industrial and urban development and non-compatible agricultural practices. The PBHJV partners have been conducting surveys of farmland in the City of Delta since the mid-1990s. Preliminary results from the most recent surveys show that soil-based agriculture (i.e., vegetables, grain, hay, pasture, fallow) is declining markedly. In 1997, for example, 763 acres (309 hectares) were planted for berry production, and by 2007, this had grown to 3,027 acres (1,225 hectares), a 300% increase. In 1995, greenhouses covered 52 acres (21 hectares) and by 2018,



Conservation specialists with Ducks Unlimited Canada monitoring the Fraser River Estuary.

Ducks Unlimited Canada



Restoration of salmon habitats in the Fraser Estuary will also benefit waterfowl and shorebirds.

Megan Winand, Ducks Unlimited Canada

In the face of a growing population, increasing development pressures, skyrocketing land prices and climate change impacts, PBHJV partners' work to conserve the Fraser River Estuary's habitat values is more urgent than ever, so partners are mobilizing to come up with creative solutions.

the coverage had expanded to 670 acres (271 hectares), a 1,200% increase. Much of the land converted to berries and greenhouses was formerly fields supporting foraging habitat.

These drastic changes—occurring on some of the most expensive lands, thereby preventing purchase for conservation—signal a need to maintain funding to the farmland stewardship program. Operated by PBHJV partners for more than two decades, the farmland stewardship program faces daunting economic pressures for alternate farm practices. The Fraser River Estuary is so key to wintering and migrating waterfowl and shorebirds that the program must continue. The PBHJV is also beginning to explore new and innovative ways to fund stewardship in the estuary.

Sea-level rise is an added threat to the estuary, since shoreline alterations to protect human infrastructure are being planned and will likely become increasingly common. Joint Venture partners are working with municipalities to explore alternatives to traditional dykes to allow for habitat for birds, salmon and other wildlife. The growing disconnect between people living on the estuary's lands and the natural systems that make the area so important for waterfowl and other birds has the potential to further influence the types of land-use decisions being made, with the consequence of serious threats occurring to the farmland, natural spaces and ecosystem services provided by the Fraser River Estuary.

Creative solutions to counter the threats

In the face of a growing population, increasing development pressures, skyrocketing land prices and climate change impacts, PBHJV partners' work to conserve the

Green-winged Teal.
Graham Sorenson



Fraser River Estuary's habitat values is more urgent than ever, so partners are mobilizing to come up with creative solutions. The PBHJV is taking a bigger-picture look at its programs and focusing on policy, human dimensions and engagement with non-traditional partners such as municipalities. As a result, several initiatives are receiving attention and funding.

For example, ECCC provided funding to the City of Delta—one of three municipalities with decision-making abilities in the estuary—to support their Birds and Biodiversity Strategy. Funds went toward creating a communication strategy focused on the importance of the estuary to migratory birds and ecosystem services. In addition, the funds contributed to social science studies to determine the motivations that drive residents to support the conservation of bird habitat, including agricultural lands, coastal marshes, natural spaces and beaches. Telephone surveys were conducted in March 2019, and the results will inform future activities to engage residents in the conservation of migratory bird habitat. Preliminary results show an interest by residents in the agricultural activities of the area, which is a benefit for waterfowl conservation, as these agricultural landscapes are a key element of the wintering habitat in the estuary.

In December 2018, Ducks Unlimited Canada (DUC) received a \$2 million grant over four years from the Government of Canada's Coastal Restoration Fund to restore coastal habitats in the Fraser River Estuary. While the funds are focused on salmon habitat, there are clear linkages between healthy salmon habitat and healthy waterfowl and shorebird habitat. This project funded a workshop that brought estuary restoration experts from the San Francisco Bay Joint Venture and Washington State to speak about options for future restoration work in the estuary. Having successfully restored

estuaries from agricultural lands elsewhere, they shared their knowledge about a variety of techniques such as dyke breaching and building earthen structures to restore land compacted to below sea level.

Several other conferences and workshops also allowed PBHJV partners opportunities to highlight the Fraser River Estuary and connect with scientists and restoration specialists internationally. In August 2018, PBHJV attended the International Ornithological Conference in Vancouver, B.C., with a poster presentation to draw attention to the Fraser River Estuary, the NAWMP and the 22 Habitat Joint Ventures across North America. In October 2018, Bird Studies Canada attended the Ramsar Conference of the Parties in Dubai and presented on the Fraser River Estuary, as well as supported BirdLife and others in passing "Resolution XIII.20: Promoting the conservation and wise use of intertidal wetlands and ecologically-associated habitats."

Conservation on Vancouver Island

In an excellent example of partnership, Somenos Conservation Area—a wetland complex on Vancouver Island—has been partially protected by previous securements of 350 acres (142 hectares) by DUC and The Nature Trust of British Columbia. The area has been stewarded by the Somenos Marsh Wildlife Society. In 2018, the Province of British Columbia designated an additional 35 acres (14 hectares) as a provincial Wildlife Management Area (WMA), further conserving this important site for species such as Trumpeter Swan and Great Blue Heron. Recognizing the traditional territory of the Cowichan Tribes, the WMA, in partnership with the Cowichan Tribes,



Aerial view of Somenos Marsh.
The Nature Trust of British Columbia

was named S’amunu Wildlife Management Area, creating a large network of conserved wetlands in the Somenos Wetland Conservation Area, also designated an Important Bird and Biodiversity Area.

Also on Vancouver Island, Nature Conservancy of Canada (NCC) started a multi-year project to restore 6 acres (2.4 hectares) of wetlands in the Cowichan Estuary. Working with wetland restoration experts, the Province of British Columbia and the Cowichan Tribes, NCC is working to reclaim marshes drained for agriculture as functioning wetlands for the use of birds, salmon and species listed in Canada as being at risk. After just one year, dozens of Mallards are already using the site to feed, breeding Wood Ducks have been sighted and many other birds—Red-tailed Hawks, Red-winged Blackbirds, Marsh Wrens and Great Blue Herons—have been seen using this newly created habitat.



These varied projects demonstrate the breadth of work being undertaken in the PBHJV and highlight the importance of the many partnerships that make successful restoration and securement projects possible in coastal British Columbia.

For more information, contact Andrew Huang, Pacific Birds Habitat Joint Venture Coordinator, (604) 350-1913, andrew.huang@canada.ca.

Pacific Birds Habitat Joint Venture Contributions (CAD)

	2018-2019	Total (1991-2019)
Total	7,206,791	228,064,983

Accomplishments (Acres)

	2018-2019	Total (1991-2019)
Secured	624	138,355
Enhanced	24,163	198,344
Influenced		6,780,334

Secured and enhanced acres are not additive.

2018-2019 consists of the April 1, 2018 to March 31, 2019 time frame.

1991-2019 consists of the January 1, 1991 to March 31, 2019 time frame.

Harlequin Duck.

Lily Campbell





Species Joint Ventures

Snow Geese.
Anthony Zerafa

Species Joint Ventures are international in scope, spanning North America and including circumpolar countries. These joint ventures focus on critical science needs to inform the management of over 20 species (50+ populations) and their related habitats. Additionally, research directed through the Species Joint Ventures addresses questions for other bird species that share the habitats.



Arctic Goose Joint Venture

Bylot Island Camp in 2019.
Gilles Gauthier



www.agjv.ca
www.pcoa.ca
www.gansodelartico.com

The AGJV covers 924 million acres (374 million hectares) spanning North America and including other circumpolar countries, such as Russia. It focuses on 24 populations among seven species: Greater White-fronted, Emperor, Snow, Ross's, Brant, Cackling and Canada Geese. Arctic geese use all four flyways.

North America is home to 83% of all geese in the Northern Hemisphere, and 80% of North American geese are included under the Arctic Goose Joint Venture (AGJV) umbrella. Geese are continentally important for harvest and viewing, generating millions of dollars in economic benefits each year. Geese make up 25–30% of all waterfowl harvested continentally, and they are also an important food source for arctic and Indigenous communities.

For more than 30 years, the AGJV has contributed to research and monitoring projects that facilitate improved understanding and management of geese. Much of the work occurs in the Arctic and would not be possible without remote field camps, established and operated cooperatively by governments and the flyways. It is hard to imagine the logistics of constructing and maintaining safe, habitable accommodations near major goose colonies in areas with extremely limited access, harsh weather and polar bears. The history of these camps is remarkable.

Nester One, Est. 1967

The oldest goose camp was established in northern Manitoba to study Canada Geese nesting along the Hudson Bay coastline. Nester One was named for its "goose nesting" radio call sign. The original camp consisted of a Quonset hut and an outhouse that was regularly destroyed by polar bears. For many years, a Churchill resident transported supplies on his Bombardier tracked snow machine, hauling everything from aircraft fuel and heating oil to groceries and building supplies (including the kitchen sink), and in all kinds of weather.

In memory of Mike J. Johnson

who unexpectedly passed away in May 2019. Mike was a long-term employee of the U.S. Fish & Wildlife Service and American co-chair of the Arctic Goose Joint Venture Management Board since 2008. Mike's dedication and passion for waterfowl conservation will be sadly missed in both Canada and the United States.



Michael J. Johnson, AGJV Management Board
Co-Chair 2008–2019.

Ken Abraham



Supplies en route to Nester One Camp in the early 1970s. One of the earliest records of banding in northern Manitoba is from 1956 when scientists used freighter canoes and herded goose broods on foot!

Murray Gillespie

Nester Two/La Perouse Bay, Est. 1968

Originally named to distinguish it by radio from Nester One, this camp was established to study the Snow Goose colony at La Perouse Bay, Manitoba. The Snow Goose research at the camp focused on the complete life history including genetics of colour, mating systems, population structure and survival. From 1979 to present, research has expanded to include goose–plant interactions of the Hudson Bay coastal ecosystems. Starting as a single building, the camp now includes several buildings and has been used for long-term studies of Common Eiders, Willow Ptarmigan, Savannah Sparrows, Polar Bears, numerous shorebirds and aquatic invertebrates.

Akimiski Island, Est. 1980

Initially a tent camp for Canada Geese banding, this camp is on the coast of James Bay, Nunavut. In 1993, it was expanded to monitor annual nesting biology and gosling survival, and research there is now much broader, focusing on community ecology questions. While coastal fog is often a challenge for aircraft—typically twin otters or helicopters arriving from Moosonee, Ontario, approximately 140 miles (225 km) away—polar bears command the most attention. The now-permanent camp has plywood cabins and a helicopter landing area, all surrounded by secure “zoo” fencing to protect both crews and helicopters from the bears.

Nikko Island, Est. mid-1980s

Arctic Char research was the reason for this camp being established about 185 miles (300 km) northwest of Iqaluit on Baffin Island, Nunavut, with goose research beginning in the mid-1980s and goose banding annually since the early 1990s. The camp infrastructure was given a major face lift beginning in 2005.

Bylot Island, Est. 1988

Established in collaboration with Laval University, Quebec, this camp is within Sirmilik National Park and Bylot Island National Wildlife Area, Nunavut. Each year, dozens of Canadian and international researchers arrive by helicopter from Pond Inlet (Mittimatalik), Nunavut, 52 miles (84 km) away. As a member of national and international research networks, the camp serves a wide research domain: animal

ecology, botany, plant monitoring, cryospheric (permafrost, snow) studies, hydrology, limnology, carbon cycling and climate impacts on the ecosystem.

Karrak Lake and Perry River, Est. 1991

Located on Camp Island in Queen Maud Gulf Migratory Bird Sanctuary about 185 miles (300 km) southeast of Cambridge Bay, Nunavut, this camp began as a main cabin plus two frame tents and now has six buildings. The first boat used to ferry people and supplies to and from Camp Island was constructed of blue plastic barrels and a sheet of plywood. Research at Karrak Lake has evolved into an ecosystem approach: breeding and population ecology, species interactions, environmental influences on population demographics and trophic interactions.



Karrak Lake Camp in 2009.
Dana Kellett

For more information, contact Deanna Dixon, Arctic Goose Joint Venture Coordinator, (780) 951-8652, deanna.dixon@canada.ca

Arctic Goose Joint Venture Expenditures (CAD)

	2018-2019	Total (1986-2019)
Banding	857,392	17,344,106
Research	445,996	22,867,292
Surveys	188,316	11,186,199
Collar Observations		1,324,185
Management		272,992
Conservation Planning		698,243
Communication and Education	51,882	51,882
Total	\$1,543,586	\$53,744,899

2018-2019 consists of the April 1, 2018 to March 31, 2019 time frame.

1986-2019 consists of the January 1, 1986 to March 31, 2019 time frame.



Thanks to the hard work of many, these camps have evolved over the years as they support a wide range of new research, while maintaining their core focus on geese. Collectively, about 1 million geese have been banded at these camps and more than 700 publications have resulted from the studies done by hundreds of people from across North America and Europe. As well as hosting seasoned researchers, these camps have played a vital role for students being trained in arctic field research and exposed to scientific studies.



Nikko Island Camp in 2015.
Tony Fox



Sea Duck Joint Venture

An adult male Surf Scoter.

Tim Bowman



www.seaduckjv.org

The SDJV encompasses all of Canada and the United States and focuses on coastal waters for migrating and wintering ducks and boreal forest and tundra for nesting ducks. The Joint Venture includes all 22 recognized populations among the 15 sea duck species (tribe Mergini): Common Eider, King Eider, Spectacled Eider, Steller's Eider, Black Scoter, White-winged Scoter, Surf Scoter, Barrow's Goldeneye, Common Goldeneye, Bufflehead, Long-tailed Duck, Harlequin Duck, Common Merganser, Red-breasted Merganser and Hooded Merganser. As a group and depending on the season, sea ducks use all four flyways.

One of the flagship projects initiated by the Sea Duck Joint Venture (SDJV) is providing a wealth of data critical for understanding sea duck migration patterns, habits and habitat uses. The Atlantic and Great Lakes Sea Duck Migration Study, which was briefly introduced in the *Habitat Matters 2017* publication, is a multi-year, multi-partner project to satellite-track sea ducks—in particular, Surf, Black and White-winged Scoter and Long-tailed Duck—along the Atlantic coast and Great Lakes. Since 2009, more than 400 satellite transmitters have been deployed in sea ducks.

Recent collaborations among Joint Venture partners in Canada and the United States have allowed these data to be examined with new analytical techniques that provide highly specific and relevant information to conservation managers and policy makers. One of these collaborations, now published in the scientific literature,¹ is summarized here.

Sea duck movements

Migratory birds present interesting challenges for examining and understanding connections between habitat sites during an annual cycle. Many waterfowl use the same breeding areas year after year, but their use of non-breeding sites is often more variable. Sea ducks spend at least three quarters of the year at non-breeding sites, mainly at staging areas in the spring and molting areas in the fall. Therefore, when

setting harvest levels and determining conservation measures, it's important to understand where, when and how sea ducks use these habitats.

To analyze the complex migration patterns of sea ducks among habitats and in multiple seasons, researchers drew on the Sea Duck Migration Study database, as well as data from other studies. They developed a network model to show habitat connections and then used the model to examine movement patterns of sea ducks in eastern North America.

Key molting sites

The results of this modelling work showed that eastern North American sea duck populations use Atlantic Coast habitats for pre-breeding staging and stopovers during spring migration. By contrast, they frequent inland sites, notably on James Bay and the St. Lawrence Estuary, for their post-breeding molt and for staging and stopovers during fall migration. The study's findings pointed to James Bay, in particular, as a key and previously underappreciated molting area for arctic-breeding migratory birds.

Shared habitats

An additional component of the analysis showed that sea ducks have highly complex migration patterns. Outside of the breeding season, species and populations overlap extensively at shared migration and wintering sites, with individuals often moving among multiple sites during a single season. Sea ducks typically form pair bonds during non-breeding periods, so overlap of populations at these times could contribute to genetic mixing.

An umbrella species

The study examined individual species as indicators of the overall assemblage of migratory sea duck species. Long-tailed Duck was found to be most representative of the overall importance of habitat patches to migratory pathways and the connections among different locations. As a result, Long-tailed Ducks could be used in conservation and monitoring work as an umbrella species to indicate movement patterns for sea ducks in eastern North America.

Contributions to species management

Eight habitats in the Atlantic and Mississippi Flyways, including the Gulf of St. Lawrence, Gulf of Maine and southern New England, were used by all five sea duck species examined in the study. These locations have value as multi-species hubs and represent habitat needs across the entire, interconnected



Veterinarians Glenn Olsen (left) and Scott Ford prepping a Black Scoter for surgery to implant a satellite transmitter.

Scott Gilliland

population. Therefore, new management efforts could benefit sea ducks by consolidating work between the two flyways rather than focusing on a single flyway.

This type of collaborative study is valuable not only for deepening the understanding of sea duck populations and habitat needs but also for strengthening transboundary partnerships within the SDJV.

For more information, contact Margaret Campbell, Sea Duck Joint Venture Coordinator, (867) 393-6825, margaret.campbell@canada.ca.

Sea Duck Joint Venture Expenditures (CAD)

	2018-2019	Total (1998-2019)
Banding		695,345
Research	1,175,504	10,462,307
Surveys	16,372	3,630,006
Conservation Planning	13,224	1,040,515
Communication and Education		83,032
Total	\$1,205,100	\$15,911,205

2018-2019 consists of the April 1, 2018 to March 31, 2019 time frame.

1998-2019 consists of the January 1, 1998 to March 31, 2019 time frame.

1 Lamb, J.S, P.W.C. Paton, J.E. Osenkowski, S.R. McWilliams, and co-authors. 2019. Spatially explicit network analysis reveals multi-species annual cycle movement patterns of sea ducks. *Ecological Applications* 00(00):e01919. doi.org/10.1002/eap.1919



Black Duck Joint Venture

American Black Duck.

Ryan Askren



www.blackduck.cmi.vt.edu

The BDJV includes Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Newfoundland and Labrador and 14 eastern U.S. states. The American Black Duck can be found in saltwater marshes, brackish and freshwater impoundments, riverine and estuary marshes, woodland wetlands, shallow lakes and boreal bogs. Black ducks use the Mississippi and Atlantic Flyways.

The American Black Duck is the most abundant breeding waterfowl species in New Brunswick and has high ecological, economic and social importance. In 2018–2019, two Black Duck Joint Venture (BDJV) partners—Ducks Unlimited Canada and Environment and Climate Change Canada’s Canadian Wildlife Service (CWS)—in collaboration with the University of New Brunswick undertook a study of forest harvesting effects on black duck populations in the province.

Black ducks, which breed throughout eastern Canada, are generally considered intolerant of disturbance, but previous research has not examined forest harvesting effects on breeding black duck populations in New Brunswick. Forestry, the largest industry in the province, meets environmental targets in part by leaving forested riparian buffer zones around waterbodies and wetlands to reduce soil erosion and ensure groundwater recharge. In New Brunswick, forestry operations must maintain a 33-yard (30-metre) buffer around wetlands greater than 2.5 acres (1 hectare).

Analyzing survey data

Although buffer zones are known to protect wetland health, their importance for black duck habitat and populations is uncertain. Therefore, to determine the effects of forest harvesting in proximity to wetlands on the distribution of black ducks, a graduate student from the University of New Brunswick obtained data for 1995–2017 from the helicopter-based Waterfowl Breeding Pair Survey conducted annually by the CWS. The survey collects observations of black duck pairs during the breeding season and geo-references them to wetlands.



An aerial view showing a buffer zone between a small wetland and forest service road.

Kelly McLean, University of New Brunswick

For the purpose of this study, observations were overlaid with wetland features and forest-harvest activity using a geographic information system. The proportion of intact forest was determined in buffer zones with widths of 33 yards (30 metres) and 1,090 yards (1,000 metres). These widths represent the minimum buffer size required of the forest industry and the approximate home range size of forest-breeding waterfowl, respectively. Additional data collected included the distance from wetland edge to the closest harvest within 1,090 yards (1,000 metres), the year of harvest and harvest method. Because black ducks have been found to avoid recently disturbed areas, these data were gathered for the 10- and 20-year periods prior to each black duck survey year.

Understanding forestry effects on black ducks

For 10-year time periods, the proportion of intact forest buffer did not influence the presence of breeding black ducks for either buffer width. However, wetland size did have an effect: breeding black ducks were more likely to be observed on smaller wetlands. Fewer breeding black ducks were observed on wetlands when harvesting had been done recently, regardless of the harvest method. For 20-year time periods, results were similar with one exception: when harvesting had been done closer to the edge of the wetland, fewer black ducks were present.

These results suggest that commercial forestry can influence which wetlands breeding black ducks use and may affect black duck distribution in New Brunswick. The finding that breeding black ducks prefer small wetlands over larger ones suggests that maintaining smaller wetlands in commercial forests may positively influence breeding black duck abundance. Although wetlands smaller than 2.5 acres (1 hectare) are not protected in New Brunswick, they may be more important to breeding black ducks than previously thought, and future

research efforts should focus on these areas. Given the extent of active forestry operations across eastern North America, the conclusions of this study have implications for maintenance of breeding black duck populations across the species' range.

For more information, contact Tania Morais, Black Duck Joint Venture Coordinator, (506) 364-5085, tania.morais@canada.ca.

Black Duck Joint Venture Expenditures (CAD)

	2018-2019	Total (1986-2019)
Banding	319,727	8,675,042
Research	86,426	2,171,259
Surveys	397,164	8,766,983
Conservation Planning	23,864	377,915
Communication and Education		42,600
Total	\$827,181	\$20,033,799

2018-2019 consists of the April 1, 2018 to March 31, 2019 time frame.

1986-2019 consists of the January 1, 1986 to March 31, 2019 time frame.



University of New Brunswick graduate student Kelly McLean holding a banded American Black Duck.

Rachelle Breau, Ducks Unlimited Canada

Partners

Thank you to all our partners who contributed in 2018–2019:

Lac à la Tortue Bog, Quebec.

Nature Conservancy of Canada

Canadian Agencies

Acadia University
Alberta Environment and Parks
Alberta Sport, Recreation, Parks & Wildlife Foundation
Alberta-Pacific Forest Industries Inc.
Association of Sustainable Forestry
BC Hydro
Bluenose Coastal Action Foundation
Bonavista Energy Trust Ltd.
British Columbia Conservation Foundation
British Columbia Ministry of Environment and Climate Change Strategy
British Columbia Ministry of Transportation and Infrastructure
British Columbia Waterfowl Society
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Columbia Basin Trust
Crown-Indigenous Relations and Northern Affairs Canada
Dalhousie University
Dow AgroSciences
Ducks Unlimited Canada
East Kootenay (Regional District of)
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Fondation de la faune du Québec
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Ministère de l'Éducation et de l'Enseignement supérieur
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Mosaic Company
Natural Areas Conservation Program, ECCC
Natural Resources Canada – Polar Continental Shelf Project
Natural Sciences and Engineering Research Council of Canada
Nature Conservancy of Canada
Nature Trust of New Brunswick
New Brunswick Department of Agriculture, Aquaculture and Fisheries
New Brunswick Department of Energy and Resource Development
New Brunswick Department of Environment
New Brunswick Department of Transportation and Infrastructure
New Brunswick Environmental Trust Fund
New Brunswick Wildlife Trust Fund
Newfoundland and Labrador Department of Environment and Conservation
Newfoundland and Labrador Department of Fisheries and Land Resources
North Saskatchewan Watershed Alliance
Nova Scotia Crown Share Land Legacy Trust
Nova Scotia Department of Agriculture
Nova Scotia Environment
Nova Scotia Federation of Agriculture
Nova Scotia Department of Lands and Forestry
Nova Scotia Nature Trust
Nutrien Ag Solutions
Nutrien Ltd.



Great Blue Heron.

Shea Wyatt



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 Ontario Ministry of the Environment, Conservation and Parks
 Ontario Ministry of Natural Resources and Forestry
 Ontario Ministry of Transportation
 Ontario Trillium Foundation
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 Polar Knowledge Canada
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 Prince Edward Island Department of Environment, Water and Climate Change
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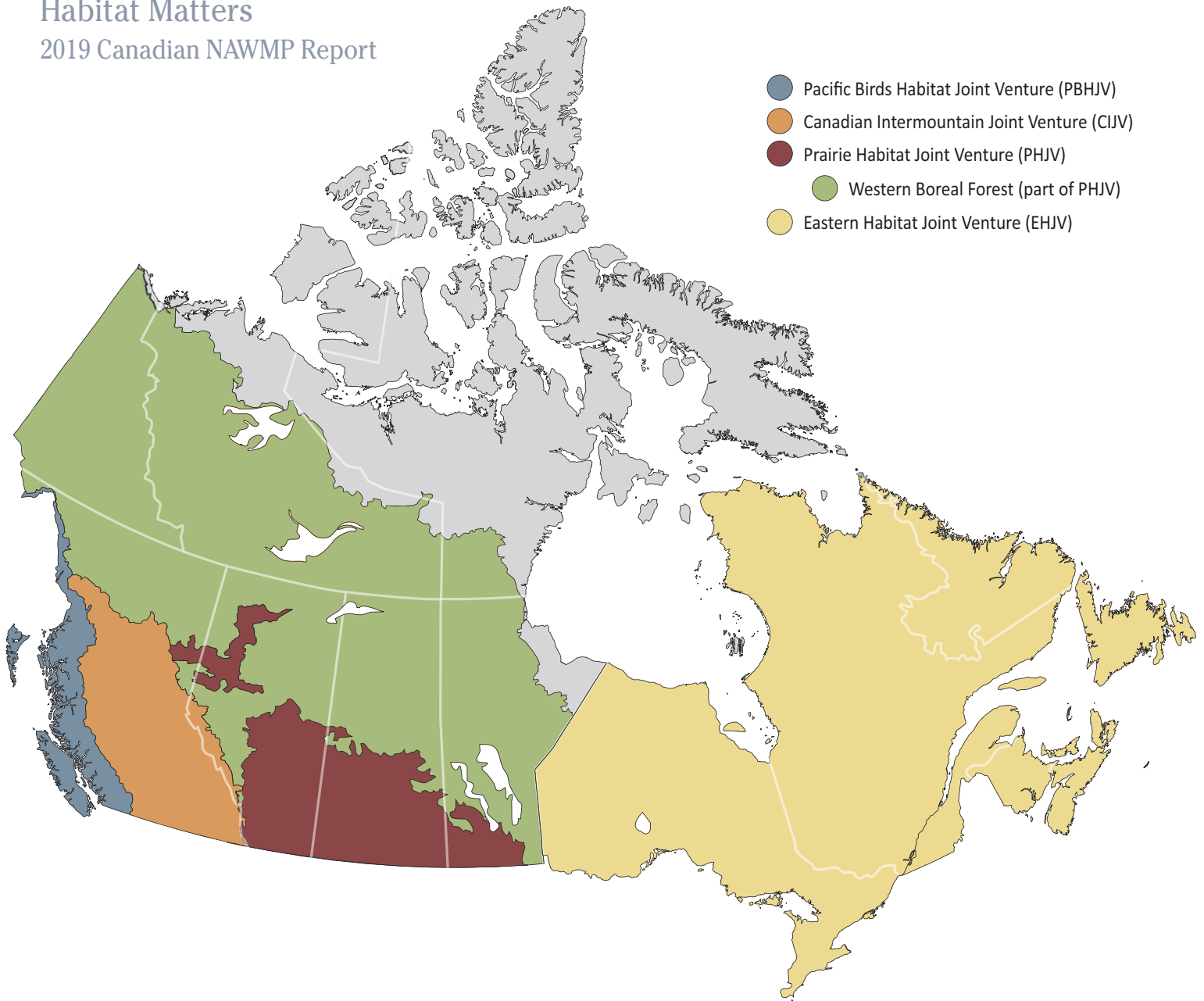
National Fish and Wildlife Foundation
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Hooded Mergansers.
 Shrijeet Kaduskar

Habitat Matters

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North American Wetlands Conservation Act Funding in Canada
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North American Bird Conservation Initiative
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Map of Bird Conservation Regions
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