



**WCS**Canada

ANNUAL REPORT 2015



# A CHANGING CLIMATE for conservation



## Message from WCS Canada President, Dr. Justina Ray

As I write this, hope is growing for a breakthrough agreement at the international climate talks in Paris. But as ecologists, we sometimes wonder, will it be too little too late?

The effects of a rapidly changing climate, from melting Arctic ice to massive forest fires, are becoming more and more evident. Many species are already having to make rapid adjustments to impacts like changes in habitat or new species arriving as competitors, predators or disease carriers. For wild species, climate change, coming on top of our often short-sighted approach to development and resource extraction, could be the proverbial straw that breaks the camel's back.

WCS Canada is tackling this challenge by focusing on identifying and protecting the big spaces and wild conditions species will need to survive the changes that are already unfolding in key landscapes. In particular, animals will need room to roam as they try to keep up with shifting habitats. That's why climate change will need to be carefully considered when planning for new development in Canada's North.

For example, as Arctic sea ice recedes and thins, new shipping lanes are opening and large vessels are increasingly sharing the same space with populations of whales, seals, and other marine mammals. WCS is working in the Beaufort Sea to develop ways to minimize the impact of increased ship traffic on marine mammals and to identify areas heavily used by wildlife that require protection.

In Ontario's Far North, we are pointing to the multiple potential benefits of regional-scale planning,

including ensuring we maintain the region's globally significant carbon storage services. In Yukon, we are helping park managers understand what the impacts of climate change will be on protected areas and keystone species over the next 50 years.

In the Crown of the Continent region stretching across the B.C., Alberta and Montana border region, WCS has developed a conservation blueprint for retaining key habitat connections that will be vital for species reacting to a changing climate.

Canada has some extraordinary wild spaces, which is why we really need to move the concept of sustainable development from easy slogan to real action. Interestingly, the Paris climate talks are in many ways joined at the hip with the recent renewal of the United Nation's Sustainable Development Goals, which will guide the development agenda of member states for the next 15 years. These goals are the UN's way of recognizing the link between a healthy planet and healthy people. Of the 17 goals that have been agreed to by the UN's 193 member countries, the vast majority will require action to protect healthy ecosystems.

Canada, with its vast wild spaces and rich biodiversity, is far from being a small player in these matters. In fact, we are a key actor and must display bold leadership on reducing climate destabilizing emissions, better securing species diversity, and leaving a wild legacy for future generations.

A handwritten signature in black ink, appearing to read 'J. Ray', written over a teal background.



**As global temperatures rise**, satellite images show less and less summer ice cover on the Arctic Ocean every year. Now WCS researchers are seeing firsthand what those images actually mean for species that are uniquely adapted to the rigours of life in one of the coldest corners of our planet.

“Polar bears are the poster child for loss of sea ice, but other mammals are equally affected, including seals, walrus, and whales,” says WCS Canada zoologist Dr. Don Reid. With the retreat of summer ice, seals and walrus that once used ice as a platform for resting and raising pups are having to adopt new strategies, such as walrus forming huge groups that huddle together on land.

This shift has been possible thanks to a northern landscape that still has vast areas of largely undisturbed natural habitat. But that does not mean it is going to be easy for Arctic species to just pick up and move or that there will not be survival costs. For walrus, for example, large groups gathered on land can suddenly rush for the sea when disturbed, leading to young pups getting crushed.

Warming waters are also reshaping Arctic food chains. For example, Arctic cod, which are a staple for seals, sea birds and whales, appear to be moving north and moving deeper, probably in search of colder waters. If seals are forced to change their diets, it is quite likely that the available fish will lack the fat of Arctic cod and therefore will be less nutritious.

Then there is ocean acidification caused by the steady absorption of excess carbon dioxide. If a more acidic ocean is unable to support the current level of growth of phytoplankton and zooplankton — single cell organisms that are the building blocks of almost every marine food chain — “all bets are off” for what the impacts on Arctic ecosystems will be, Dr. Reid says. “Ecosystem collapse is a real possibility.”

# THE ARCTIC:

## Species on thin ice



**MUSKOX WITH THEIR LONG SHAGGY COATS ARE AN ARCTIC ICON. But these ancient creatures may already be losing ground to climate change. For muskox and other Arctic wildlife, human action to reduce greenhouse gas emissions is a matter of survival.**



# THE ARCTIC

On land, changes brought about by climate change are moving somewhat slower than in the marine environment, but it is still a story of unprecedented and rapid change. In some areas, what was once open tundra is now home to shrub communities that have pushed north. For some species, like moose, that may mean new opportunities. For others, like lemmings or shrews, it may mean shrinking habitats or new competition for food.

“The whole Arctic food web is being adjusted in space, time and composition and where things are headed is not clear at all,” Dr. Reid notes.

What is clear is that there is really only one solution that can match the scale of the problem: Reducing greenhouse gas emissions as quickly as possible.

But to help wild species survive in an environment that will undergo rapid changes even if we finally start reducing emissions, we have to do more to help species cope with everything from habitat changes to loss of food supplies. One way we can do that is by establishing more protected and special management areas — particularly in regions that are rich in nutrients and diversity.

Major river deltas and offshore waters, like that of the Mackenzie River for instance, will continue to be particularly important as rivers will continue to pump nutrients into the marine world. Similarly, ice edges support remarkable diversity of species compared to areas of open ocean. Waters above drop-offs in the ocean floor are also often nutrient rich because currents and winds create upwellings.

Could we assist species by moving them to new habitat ranges that they could not reach on their own? Dr. Reid isn't certain it's a good idea. Moving shrews north to islands in the Arctic Archipelago, for example, might help shrews, but harm migratory

**ICE IS CENTRAL TO LIFE IN THE FAR NORTH.** Changes in the extent of ice coverage or shorter freeze ups could have serious impacts on wildlife. Northern lakes, such as this frozen aqua jewel in Yukon's Kluane National Park, could also be affected by climate impacts like retreating glaciers. Keeping large wild areas intact can help buffer protected areas like Kluane in an era of rapid change.

# THE ARCTIC

birds that suddenly have to compete with shrews for the insects they feed on.

Better, Dr. Reid thinks, to focus on reducing harm, particularly by planning ahead. By working to better manage the scale and pace of industrial development in one of the world's most pristine regions, we can reduce some of the pressure on species already dealing with the effects of a rapidly changing climate.

For example, less ice will mean more ship traffic through the Arctic. WCS Canada researcher Dr. Steve Insley is deploying acoustic monitors in the Eastern Beaufort to see when and where mammals are using the area and where vessels are going, with an eye to reducing future conflict. WCS is also drawing attention to the need for strict ship speed limits and recommending transponders for ships that can help whales better avoid collisions.

Today, the Arctic is sending a message about the kinds of changes that will be unleashed by climate change worldwide. Temperatures in the region have soared faster than almost anywhere else on Earth and have quickly passed the two degree Celsius "safe" limit. With temperatures still rising, we must give species a fighting chance by giving them time and space – by taking strong action to reduce emissions today and by protecting large wild spaces for tomorrow.



**WCS CANADA SCIENTIST DR. STEPHEN INSLEY** is studying the changing Arctic soundscape, everything from increased wave noise due to decreased ice cover to the underwater rumble of more frequent ship crossings. Dr. Insley's research was aided this year by the Royal Canadian Navy, which helped deploy monitors in deeper waters during their annual Arctic exercises.



**WHAT THE FUTURE HOLDS FOR WILDLIFE HAS NEVER BEEN MORE UNCERTAIN.** For wildlife that range across large areas like wolves, these ranges may get even larger as prey populations thin out or move in response to habitat changes. The survival of Arctic wolves, for example, is closely tied to the fortunes of Arctic hares. It has been reported that, thanks to climate change, hares are struggling to keep the seasonal colour changes to their coats in sync with the changing seasons, making them easier to spot. Understanding the intricate connections between species is a core part of WCS Canada's research.



**Fish just don't get a lot of respect.** Sure, when you reel in that seven-pound trout you may pause to admire its shimmering scales or sleek form before releasing it back into the depths. But it's a brief moment of visibility for a group of species that is rapidly swimming into trouble thanks to our changing climate.

"Because they are largely hidden, and because we don't see them, we underestimate how interesting and complex fish are. Fish have a lot of amazing adaptations and behaviours, even things like parental care and social behaviours, that still aren't well known or understood," explains WCS Canada scientist and fish enthusiast Dr. Connie O'Connor.

But we do know that life underwater is getting more stressful, particularly if you are a fish that likes things cold. For cold-water species like brook trout or lake trout, warming waters may force a retreat to deeper and colder areas of lakes and rivers. But past a certain point, no area may be cold enough for these species to survive, and moving will not be an option if fish are blocked by dams or road crossings.

For warm-water fish like bass, conditions in northern areas may actually become more hospitable. However, moving warm-water species further north can lead to more trouble for already resident cold-water species. "Bass aren't native to the Far North, and if they're introduced, they will cause a lot of problems for the native species. Walleye is a really important food fish for northern First Nation communities, and bass and walleye compete for food and eat each other's eggs," Dr. O'Connor points out.

And while they can't cross land, fish are an important bridge between aquatic and terrestrial ecosystems. In Ontario, for example, the annual spawning run of white sucker delivers nutrients from lakes to countless small creeks and streams, while trout



# FISH

## Swimming into trouble

**FISH THAT LIKE IT COLD, such as these brook trout, are struggling to survive as northern waters get warmer. That is why WCS Canada is focused on the conservation of large intact landscapes where some cold water areas can still be found.**



**FOR MANY FIRST NATIONS, fish are a vital part of their diet and culture. However, climate change could leave these communities facing shortages as cold-water fish populations decrease. WCS Canada researchers are looking carefully at how to maintain vital natural aquatic connections for fish.**

migrating from Hudson and James Bay bring marine nutrients to coastal forests.

It is these sorts of delicate connections that are being disrupted by our changing climate. “Researchers have already documented a die-off of brook trout in the Sutton River in 2001, when migrating fish returning from Hudson Bay experienced very warm air temperatures and warm water temperatures in the river,” explains WCS Canada’s northern boreal researcher Dr. Cheryl Chetkiewicz.

Fortunately for fish in Ontario’s Far North — one

of the world’s largest areas of intact boreal forest — there is still room to move. The region contains five large watersheds that are free of dams or other human-made obstructions, something almost unheard of anywhere else in the world. This kind of freedom is critical for migrating fish, like ancient lake sturgeon, and will make it possible for northern fish to take refuge in areas with cooler waters. That, in turn, creates a degree of climate change resilience for fish in this region that is now missing in fragmented rivers further south.

## keeping FISH swimming

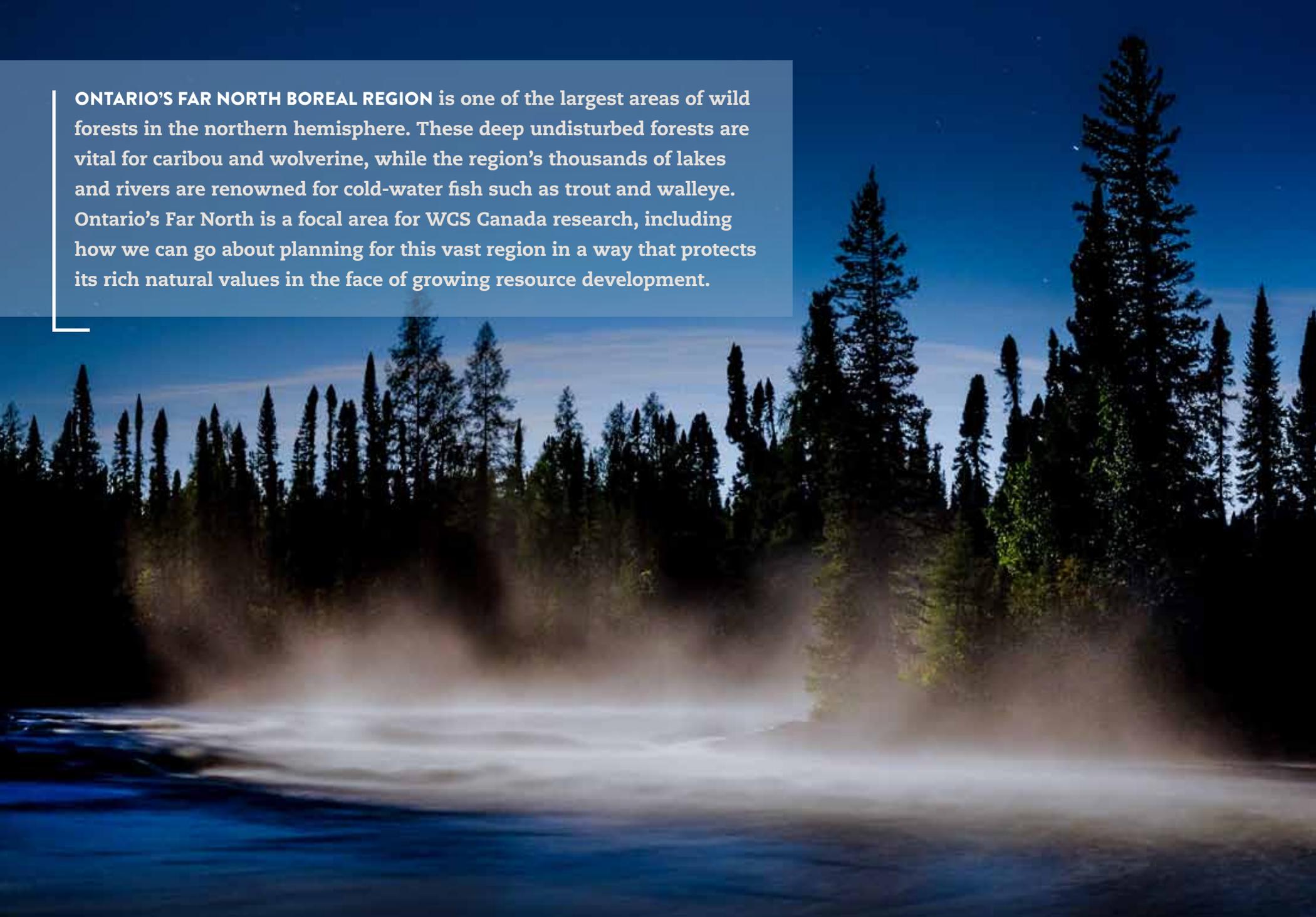
Similarly, Dr. O’Connor points out that “large intact wetlands like the Hudson Bay Lowlands are also really important, because they help moderate our climate by storing carbon.” Peatlands are especially important in this regard and there is concern that rising temperatures could lead to a drying out of these vital carbon storehouses. “Of course our northern rivers and lakes are embedded in peatlands. So what happens to peatlands has a tremendous impact on waterways,” Dr. O’Connor adds.

This is why keeping large wild areas undisturbed is so important and why careful, comprehensive planning is needed before we decide to embark on the building of roads, rail lines or pipelines in these areas. “We need to look at the region as a whole as a big connected system. That means we need to avoid piecemeal decision making that leaves only smaller areas intact and that also leads to increases in human activities that can stress fish species already facing the challenge of climate change,” Dr. Chetkiewicz says.

Problems like contamination from mine sites, siltation or erosion from forestry or road construction or new obstacles created by dams or road crossings can worsen the already deteriorating odds of survival for fish, Dr. O’Connor explains. New roads to previously hard-to-reach lakes can also create an influx of eager anglers, putting pressure on fish populations and making it far more difficult to monitor how many fish are being removed.

The message bubbling up from below is clear: We must act quickly to reduce greenhouse gas emissions to buy time for fish already swimming upstream against the forces of climate change. And we must keep their options open, by keeping large intact watersheds like those in Ontario’s north as wild and undisturbed as possible.

**ONTARIO'S FAR NORTH BOREAL REGION** is one of the largest areas of wild forests in the northern hemisphere. These deep undisturbed forests are vital for caribou and wolverine, while the region's thousands of lakes and rivers are renowned for cold-water fish such as trout and walleye. Ontario's Far North is a focal area for WCS Canada research, including how we can go about planning for this vast region in a way that protects its rich natural values in the face of growing resource development.



# FELLOWS



**ABOVE, STUDENTS MEASURE CARBON EXCHANGE (CO<sub>2</sub>)** between plants, soil and the atmosphere in a drained peatland in the Hudson Bay Lowlands. This is part of a project being led by WCS Canada Fellow Lorna Harris looking at the impacts on carbon storage of draining peatlands for mining projects.

**Each year**, with generous support from The W. Garfield Weston Foundation, we are proud to provide Fellowships to graduate students from across Canada whose research helps us better understand two key wild areas: the boreal region of northern Ontario and the northern boreal mountains of Yukon and British Columbia. This is a terrific opportunity to expand our northern field work while training and mentoring the next generation of conservation biologists.

For snapshots of the research projects our Fellows are working on visit our website at [WCSCanada.org](http://WCSCanada.org) and click on the Fellowships tab.

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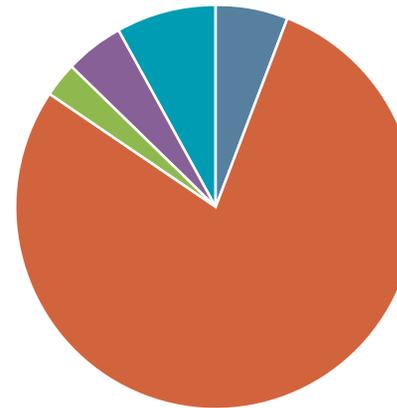
# 2015 FINANCIAL RESULTS

ASSETS	2015	2014
Cash and Cash Equivalents	2,007,915	1,752,243
Accounts Receivable	209,127	72,258
Prepaid Expenses	80,954	71,369
<b>TOTAL ASSETS</b>	<b>2,297,996</b>	<b>1,895,871</b>

LIABILITIES & NET ASSETS		
<b>Liabilities</b>		
Accounts Payable and Accrued Expenses	116,857	117,727
<b>Total Liabilities</b>	116,857	117,727
Deferred Contribution	20,000	–
<b>Net Assets</b>		
Fund Balance		
Unrestricted	95,957	128,084
Restricted	2,065,182	1,650,060
<b>Total Equity</b>	2,161,139	1,778,144
<b>TOTAL LIABILITIES &amp; EQUITY</b>	<b>2,277,996</b>	<b>1,895,871</b>

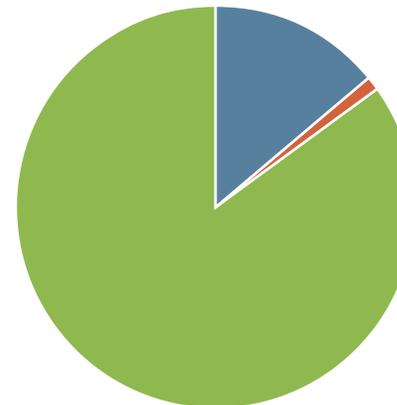
REVENUE & EXPENSES		
<b>REVENUE</b>		
Donations and Grants	2,534,163	2,265,623
Wildlife Conservation Society*	178,595	185,955
Other	212,363	133,227
<b>TOTAL REVENUE</b>	2,925,121	2,584,805
<b>EXPENSES</b>		
Program and Operating Expenses	2,542,127	2,377,383
<b>TOTAL EXPENSES</b>	2,542,127	2,377,383
<b>EXCESS OF REVENUE OVER EXPENSES</b>	<b>382,994</b>	<b>207,422</b>

\*Support from the Wildlife Conservation Society (WCS) Global Conservation Program.



## Where our funding comes from

- Foundations
- Individuals
- Wildlife Conservation Society\*
- Government
- Other



## How we use your donation

- Programs to save wildlife and wild places
- Administration
- Fundraising



**WCS Canada is fortunate to have many generous supporters who have joined with us in protecting Canada's wildlife and wild places. Thank you!**

**WCS Canada would like to acknowledge THE W. GARFIELD WESTON FOUNDATION for its extraordinary contribution to northern science and conservation. We are deeply grateful for the Foundation's commitment to Canada's north and for their ongoing support for WCS Canada's efforts to achieve our ambitious conservation goals.**

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Flora & Arnold Agnew  
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Thanks to the professional photographers who contributed stunning imagery to this report. You can see more of their awe-inspiring work on their websites:

Peter Mather (cover, page 3, 7):  
[petermather.com](http://petermather.com)

Kieran O'Donovan (page 5):  
[kieranodonovan.com](http://kieranodonovan.com)

Paul Vecsei (page 6):  
[underwaterfishphotos.com](http://underwaterfishphotos.com)

Allan Lissner (page 8):  
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