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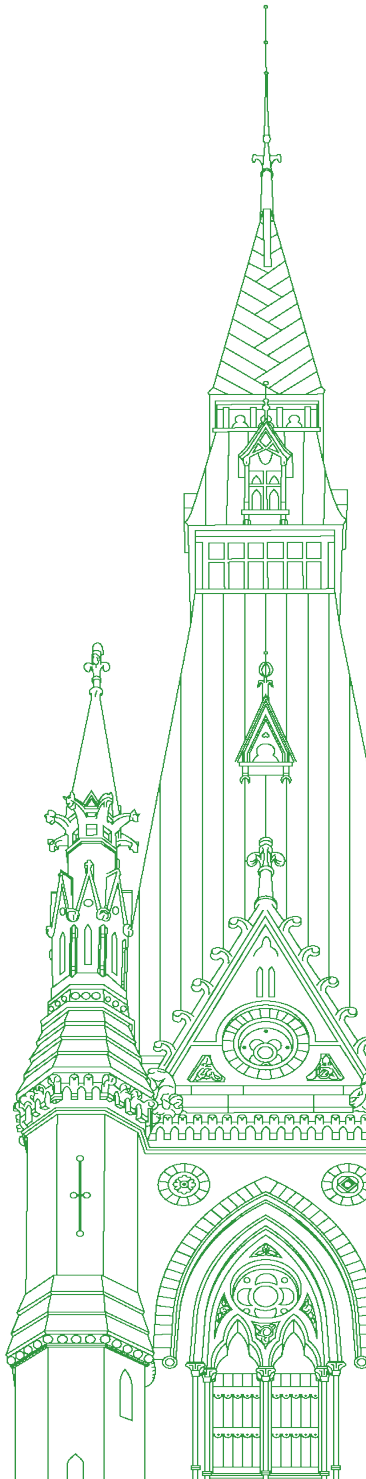

Chair: The Honourable Kirsty Duncan

Standing Committee on Science and Research

Thursday, February 9, 2023

● (1100)

[*English*]

The Vice-Chair (Mr. Corey Tochor (Saskatoon—University, CPC)): I call this meeting to order.

I welcome you to meeting number 29 of the House of Commons Standing Committee on Science and Research.

Today's meeting is taking place in a hybrid format pursuant to the House order of June 23, 2022. Members are attending in person in the room and remotely using the Zoom application.

Pursuant to Standing Order 108(3)(i) and the motion adopted by the committee on Monday, September 26, 2022, we are continuing our study on citizen scientists.

I would like to make a few comments for the benefit of the witnesses and members.

Please wait until I recognize you by name before speaking. For those taking part by video conference, click on your microphone icon to activate your mike, and please mute yourself when you are not speaking.

I will remind you that all comments should be addressed through the chair.

I will do my best to keep everyone on time. If you watch—especially the presenters at the end of their five-minute slots—and see that I'm giving you the speed-up signal, please wrap it up. I mean no disrespect, but we need to get through all our witnesses and questions today.

In accordance with our routine motion, I inform the committee that all witnesses have completed the required connection tests in advance of this meeting.

I would now welcome our guests to our committee. We'll start with opening statements from Dr. Moran for five minutes.

Dr. Moran, you have the floor.

Dr. Kathryn Moran (President and Chief Executive Officer, Ocean Networks Canada): Thank you very much for inviting me. I'm the president and CEO of Ocean Networks Canada, and I'll describe it as ONC throughout.

We operate one of Canada's largest research facilities funded by the Canada Foundation for Innovation and the Government of Canada.

We operate these world-leading cabled ocean observatories in Canada's Pacific, Arctic and Atlantic oceans. These observatories collect and deliver real-time ocean data for science, society and industry. Through our data system, Oceans 3.0, data are collected in all forms, are quality assured and archived and are made openly available.

In 17 years of operations, ONC has grown to support more than 22,000 users from Canada and around the world. We currently host 12,000 sensors, many of which are Canadian made, and we currently store over 1.2 petabytes of data, a vast archive, which is an ocean resource.

Canada's coastline at 250,000 kilometres is the world's longest. If outstretched, it would circle the earth's equator over six times. Given this scale, the unprecedented threats from climate change and the ocean's particular role in regulating our climate in making the earth habitable, citizen scientists are helping to fill a gap that is critical for understanding our changing ocean, its impacts and ways to mitigate and adapt to these impacts.

ONC's citizen science programs launched in 2012 when we deployed our first cabled observatory in Cambridge Bay, Nunavut. While engaging with the community to design this first of its kind observatory, ONC learned that the community wanted real-time information particularly about the thickness of the sea ice to ensure their safety, as climate change had made travelling on the ice risky and unpredictable. Therefore, we included a sea ice profiler instrument to the observatory. That first year we were all keen to learn if this observatory would withstand the harsh Arctic environment. I'm pleased to say that it did, and it continues to this day. From that first day, their observatory provides sea ice thickness data to the community in real time. The data from all the instruments are of particular interest to the community's youth, who regularly engage with ONC science to analyze them and understand their changing ocean front yard.

The Cambridge Bay community observatory's success set ONC on a path to work with other coastal communities and initiated citizen science in many other locations. Citizens make excellent scientists because they understand that their data are beneficial to local and sometimes national decision making. To complement community observatories, ONC developed the community fishers program which puts science instruments in the hands of citizens. Many local boat operators, mariners and volunteer citizens regularly collect ocean data to help inform responsible ocean management. ONC now supports 37 community observatories and citizen science programs, mainly with indigenous partners, on all three of our coasts. We anticipate these numbers will continue to grow.

These localized observing systems complement existing regional and global marine research activities, while also providing education, training and outreach opportunities for many coastal dwellers, including for indigenous businesses, communities and youth.

There are key success factors that demonstrate the value of these programs. Clear partnership roles and understanding communities' unique needs are, without a doubt, the foundation to this success. Respecting indigenous data sovereignty and implementing the ownership, control, access and possession, or OCAP, principles are another. The data must be provided openly to the local communities for easy retrieval and be of the highest quality. It is also important to provide support to citizens wishing to participate. In our case, the support might include funding for a community boat to collect the data or compensate a dedicated community participant for their precious time.

ONC has found that citizen scientists are a key stakeholder group that fills gaps in our ocean knowledge. Programs like the oceans protection plan and the salmon restoration and innovation fund, and now Canada's ocean conservation goals, like 30 by 2030, would see great benefit from an expansion of citizen science where many indigenous communities are truly the stewards of Canada's coastline. Such programs continue to contribute to Canada's leadership in ocean science and provides critical information for combatting the impacts of climate change on all three coasts.

From just coming from IMPAC5, I can say that I see Canada as truly leading the world in indigenous citizen science.

● (1105)

Thank you very much for your time.

The Vice-Chair (Mr. Corey Tochor): Thank you, Dr. Moran. Thank you for keeping it within five minutes.

Now we'll go to Mr. Hwang for five minutes.

Mr. Jason Hwang (Vice-President, Salmon, Pacific Salmon Foundation): Hi, everyone, and good morning. My name is Jason Hwang, and I'm here in my role as vice-president of salmon programs with the Pacific Salmon Foundation.

I'd like to thank the committee for inviting me to appear.

Before joining the Pacific Salmon Foundation four years ago, I spent 25 years working with DFO. From then until now, I've worked with and supported citizen scientists, and I have a deep respect and appreciation for the work they do.

Here's the main point I want to highlight for you today: Canada is missing out on huge, untapped potential to engage citizen scientists, especially in areas where there's a natural public interest in a subject. To explain this, let me turn to an example of Canada's engaging the capacity and talent of our communities, the sport of hockey.

Why is Canada so good at hockey? It's because we have the best players and the best coaches. Where do they come from? They come from our community hockey programs. Every hockey player in Canada was once a community hockey player and so was every coach. Hockey is more than just the players who play in the NHL; it's about the entire network of volunteers, amateurs and professionals who all play a part in making Canada the best of the best.

We can look at science in a similar way. We have professionals at universities and in government agencies, but we also have non-professionals in our communities who can be important parts of a broader network and system that can do more work, study more things and solve more problems than the professionals can on their own. Canada is a vast country, and professionals can't be everywhere doing everything, but we do have citizens out there who are well placed to do their part. Our hockey teams are great because of significant community engagement and support; we can do something similar when it comes to science.

How do we support and grow citizen science capacity in Canada?

First, we need a strategy and a system, not ad hoc ideas or funding that we throw out there and hope for something good. Second, we need to let people know how they can help. We need to give them a bit of guidance and direction. Third, we need their work to turn into something useful. Where does it go? How can it be used? Fourth, we need to show people that the work is important, valued and appreciated. We need to show up, see what they're doing and say thank you.

The federal government is generally not all that well placed to directly engage citizen scientists, but the federal government can use bridging organizations to help support more citizen science work. As an example, at the Pacific Salmon Foundation, we have a 35-year history of working with federal and provincial governments, first nations organizations and community groups. We have administrative, scientific and technical capacity that can help to connect federal funding and priorities to programs of high impact and high benefit to the community interests. For every dollar that's put into these projects, about $7 in value is created through the leveraged efforts of community volunteers.

Here's an example from our work of the kinds of things that can happen when we engage citizen scientists. We're partnering with the Dr. Francis Juanes lab at the University of Victoria on an adult salmon diet study, and here's how it works. When citizen science volunteer anglers catch a salmon, they send the salmon's stomach to researchers at the university, where the contents are sorted and identified. The results give us a picture of what the salmon are feeding on throughout the seasons as well as the size and type of forage fish that are present in those locations.

Since sample collection is undertaken voluntarily from anglers located all over the area, the program has proven to be a cost-effective way to monitor and track changes in forage fish populations in the Salish Sea. From a research and conservation perspective, the results are relevant to a better understanding of forage fish stocks, which are essential food sources for our wild salmon. The program is also valuable because it engages the recreational fishing community and increases their understanding and enthusiasm for the science. It's a wonderful project, and it's providing data that is not available via typical science sources.

I'd like to leave you with a quote from Roméo LeBlanc in 1978 when he was the minister of Fisheries and Oceans. He was speaking about the new DFO salmon enhancement program. Here's what he said:

> The Enhancement Program's real longterm success will be measured not so much by the miles of spawning channel as by the respect of generation after generation visiting these channels, and salmon streams, and rivers.... [T]he real investment of the Salmonid Enhancement Program is in—not for, but in—the people of British Columbia.

With this as inspiration, if we develop strategies and systems to support citizen science, we will be able to engage and activate enormous untapped capacity that exists across the country, and we will be able to do more work, study more things and solve more problems.

Thank you.

● (1110)

The Vice-Chair (Mr. Corey Tochor): Thank you, Mr. Hwang.

Now we will move to the six-minute question round of our committee.

We're going to start with the Conservatives and Mr. Soroka.

Mr. Gerald Soroka (Yellowhead, CPC): Thank you, Mr. Chair.

Thank you to the witnesses for coming today.

I'll start off with Dr. Moran.

You said that you have citizen scientists who are quite concerned about the thickness of ice. That's great in one area, but how challenging is it to get all other partners on board to become citizen scientists, with the vast kilometres of our shoreline?

Dr. Kathryn Moran: Every community is different. That's what we've found. It's really about ensuring that we have rich dialogue with each of the communities. Each community has different priorities.

For example, some communities here on the west coast of British Columbia are keenly interested in understanding ship noise and how it might impact their fishing grounds or their understanding of the whale populations offshore.

We tailor the ways that we collect data with these partners in a way that meets those needs. Of course, it really does take true discussion to actually get to the key need in each of these communities.

I have to say that one overriding issue that seems to be there for all is the fact that most communities want their youth to be part of understanding science, technology, engineering and math. That seems to be universal across all of the communities.

Mr. Gerald Soroka: Thank you for that.

As you said, you have 37 communities. With the vast kilometres of shoreline we have, is that a good representation or would you like to see more?

Where more population exists, it's easier to find scientists. Where there's less, it's very difficult, I'm sure.

I was wondering how much more. Is that an appropriate amount?

Dr. Kathryn Moran: No, we need many more, of course.

As I mentioned, you need to ensure that the data collected are of a high scientific value, as Jason just talked about. At Ocean Networks Canada, we have built a back end on the data side to be robust enough to actually expand tremendously.

We are ready to expand. We have been in discussions with Fisheries and Oceans Canada about the potential to do that.

Mr. Gerald Soroka: Do you think, then, in these remote areas...? You mentioned that one of the sensors you were using survived the winter and that this was great.

Is it a valid type of system to continually use the sensors and monitoring or do you actually need boots on the ground, so to speak?

● (1115)

Dr. Kathryn Moran: We do have to have some training, of course, but the community fishers.... Actually, one reason we started community fishers was the Pacific Salmon Foundation's hallmark approach to citizen science. It's really putting an instrument in the hands of these communities. They gather data in their own way, so it really is pretty seamless.

Some communities on the B.C. coast have their own boats. In the Arctic, during the winter, they drill holes in the ice and put the sensors through the ice. The sensor systems have proven to be pretty robust.

There is such keen interest in communities collecting their own data. I think it has the potential to grow almost seamlessly, with a modest amount of funding, as has already been described.

Mr. Gerald Soroka: Thank you for that, Dr. Moran.

Mr. Hwang, you said that we have a lot of citizen scientists out there in the wings not even knowing they're citizen scientists. I love the fact that you said funding isn't the save-all grace.

Really, how do you engage them better to make sure their information will be valid and everything?

Mr. Jason Hwang: It's a big question, but I'll maybe turn some focus, at least from my perspective, to how the federal government entities can help with that. I would almost look at the federal government entities as really well placed to be the guides and supporters looking at how you can match federal priorities and federal funding programs to the possibility and capacity that can be leveraged by the vast network of citizen scientists, people who are out there.

As an example, if I went out in my local stream and I was really interested in looking after it, and I had a temperature monitor—maybe I just had a thermometer—and I went every day and I wrote down the temperature of the stream, we know that the temperature of streams is changing with climate change. It's important information for knowing how good the water quality and the fish habitat might be to support our fish. But if all I do is write that down in my notebook, take it back and put it on a shelf and tell somebody I'm doing it, it doesn't do anything.

But if we can take that information, plug it into a network and get it to people who can use it to make better decisions, better investments or better choices, it can support management and conservation, and it doesn't cost anything. I'm happy to drive out or walk past my local stream every day and work with my neighbours and say, “We'd better send this information to somebody”.

Right now, we're not organized. We have some programs—the work that Dr. Moran was just speaking of as an example—that have been there for some time and are really good, but it's a fraction of what is possible. If we start to look at it like we look at hockey, we've got lots of hockey going out there, and it feeds up to a great system, but someone has to organize it. I think helping to organize it and then supporting it for the long term—not providing a million dollars and a new program, thinking it's just great, and then going away.... It's just about a standard and providing little bit of support and consistency, and organizing it, and that will go a long way.

The Vice-Chair (Mr. Corey Tochor): Thank you so much for that testimony.

We're now moving on to the Liberal member of Parliament, Madam Diab.

Ms. Lena Metlege Diab (Halifax West, Lib.): Thank you very much, Mr. Chair, and thank you to both of our witnesses for appearing today to enrich our conversation on citizen science and give us important information that can assist us as parliamentarians.

Ms. Moran, you are the president and CEO of Ocean Networks Canada. I come from Nova Scotia, which has “Canada's ocean playground” on our provincial vehicle licence plates, so the ocean is a very important element as an economic driver, but also for many other reasons in Nova Scotia as well, because we're surrounded by four major bodies of water.

A question for you is how do you recruit citizen scientists?

Dr. Kathryn Moran: The way that Ocean Networks Canada is working is to really engage with indigenous communities. In fact, we have a partnership with the Maritimes tribal council in Nova Scotia. There's a keen interest in indigenous communities to be those coastal stewards. That's our primary focus at this time because of the fact that among the small coastal communities in the country many are indigenous. That's the main way we do it.

The other way that we do it is through education programs in schools. That happens by basically bringing teachers together to explain how older youth can become part of citizen scientist programs. Once they have that way of doing things, they can typically stick with it.

● (1120)

Ms. Lena Metlege Diab: Tell me a little bit more about the contribution of the indigenous citizen scientists. In what projects are they involved?

Dr. Kathryn Moran: The program that we have is called community fishers. We provide a standard oceanographic instrument to a community. We provide training. Then that community, usually with leaders and youth together, set out to capture data, typically on a weekly basis, using their own boats, or in the Arctic, for example, they go out on the ice and drill a hole. These are basically instruments that you lower down through the water column and then bring them back up. You're collecting data on a regular basis at the same locations that are important to these communities. The important part, and I think Jason mentioned this, is to have some way to share those data.

Ocean Networks Canada has one of the best ocean sensor data systems in the world. All the data are readily moved from the instrument to basically a small computer, and then when the community member gets back to Internet at some location, it uploads directly to our data management system where we do all the QA/QC. By the time they get home, the data are available to them. Those are critically important elements because when the community knows they're collecting data of high quality and it's available to them right away, it is a win-win-win, and it's those pieces that are critically important to a successful citizen science program.

Ms. Lena Metlege Diab: I think a couple of days ago Minister Murray announced major funding over five years for Oceans Networks Canada to enhance a world-class ocean monitoring system. I'm sure you're aware of that, but can you tell me how these funds will be spent and whether new citizen science projects are being considered?

Dr. Kathryn Moran: I'll answer your second question first. Yes, that's our intention—to expand citizen science programs, particularly the community fishers program, for the purpose of growing the indigenous coastal communities to be truly the stewards of our coastline. That is through the marine protected area efforts that are so ambitious and wonderful, which the federal government has implemented to have 30% by 2030.

In terms of the funding that was announced by Minister Murray—and I was so delighted to be there—we're doing many things. In addition to citizen science programs and coastal observatories with communities, we operate large ocean infrastructure to monitor the ocean for many different things.

For the purposes of Fisheries and Oceans Canada's priorities, it's really understanding ocean currents basically as part of improving marine safety and its new response. It's monitoring all aspects of where we have sensor systems to understand the impact of climate change on our oceans and to also then collect data associated with ocean noise, which has a negative impact on marine mammals. Having real-time ocean noise data—and some of the coastal communities are collecting this data as well—helps us to mitigate the impact on marine mammals.

Those are examples of the many things we're doing with the funding we have—which we're so grateful for—and the benefits of not only scientific research but also the efforts that are a priority for the Government of Canada.

Ms. Lena Metlege Diab: Thank you.

Mr. Hwang, you compared citizen science to hockey. Obviously, Canada is known very much for hockey. How can we get more citizens more interested in citizen science? In particular, you talked about salmon, but it could be in anything. You actually talked a lot about that. Is there anything more you can give us? How can the government or parliamentarians help you?

I'm being told I'm over my time, but I'm hoping someone else will get back to that.

● (1125)

The Vice-Chair (Mr. Corey Tochor): That or a written response to the question would be appreciated. We are 31 seconds over time on that one, but that's all right.

Moving on to the next round, we have, from the Bloc, MP Blanchette.

[*Translation*]

Mr. Maxime Blanchette-Joncas (Rimouski-Neigette—Témiscouata—Les Basques, BQ): Thank you, Mr. Chair.

I would like to welcome the witnesses who are joining us for today's study.

My first question is for Jason Hwang from the Pacific Salmon Foundation.

Mr. Huang, your organization was created in 1987 and has been in existence for over 30 years. Certainly, I want to recognize the importance you place on preserving our ecosystems and our species. Of course, pacific salmon are part of that. I note that you have a lot of citizen science programs in the Strait of Georgia and volunteers collect data and samples there.

I also notice that you receive quite a bit of money from the federal government. Can you tell us approximately how much funding the federal government contributes to your organization's mission?

[*English*]

Mr. Jason Hwang: While I didn't organize myself to bring that specific detail to committee today, I could certainly get back to committee on that in writing. I would frame it as that there are two kinds of funding we tend to receive from the federal government.

We apply for grants through large federal funding programs, like the B.C. salmon restoration and innovation fund, which is something that I think is in year three or four now. It's a significant program jointly run by the federal and provincial governments.

But there are also a couple of things from which our organization specifically receives support. One of the ways we get funding from the federal government is through an agreement whereby, when a fisher person goes fishing in the ocean and they want to catch a salmon, they have to buy a salmon conservation stamp that costs a little bit more—

[*Translation*]

Mr. Maxime Blanchette-Joncas: That partially answers my question, Mr. Hwang.

I can help you a bit. Your budget is $11 million, which is not a trifling amount, 49 per cent of which comes from government support, including the federal funding.

I noticed that you also have a very lovely website. What struck me is that your website is only available in English. I'm wondering how you believe you are going to be able to mobilize the public. To my knowledge, there are francophone communities in British Columbia. What is the explanation for your communications, your reports and your data, and your website, being entirely or solely in English?

Are you not required to have them in French?

You can receive money from the federal government, but you can't communicate in both official languages.

[*English*]

Mr. Jason Hwang: I'm not exactly sure how to answer that. I would say that we are open, as the Pacific Salmon Foundation, to doing our very best to be good stewards of resources, and to be an organization that helps Canadians and British Columbians do what they would like to do to look after our precious salmon resources.

I'd certainly be prepared to take considerations in that regard back to our organization and discuss them. I'd say we're certainly open to that.

We do our very best to take every dollar that comes in to our organization and make sure that it's invested wisely in things that are going to help our wild Pacific salmon.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you for your candour, Mr. Hwang.

That being said, if I understand correctly, and this is the point of my question, you have no obligation to do this. You can receive over $5 million in government support, but you are not required to communicate in French and English, that is, in both official languages, in all of your communications.

Is that correct?

[*English*]

Mr. Jason Hwang: To the best of my knowledge, the commitments we are asked to uphold when we are given resources by the federal government, from one source or another, do not require us to report back in both official languages.

We do our very best to comply with all of the standards and obligations that are given to us. If the federal government system were to ask us for that, we would be very happy to comply.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Hwang.

In that case, would you agree that there is inequality when it comes to access to knowledge? You take money from the government—taxpayers' money. A majority of taxpayers are anglophones, but there are also francophones, and even some who speak other languages, and they do not have access to knowledge on the same footing as anglophones.

How can citizen science be done if part of the community, including francophones, do not have access to your data, when, I reiterate, you are funded out of public monies?

● (1130)

[*English*]

Mr. Jason Hwang: That's a fair question. It's an important question.

I'd highlight that our organization gets public funds, but not only public funds. We get a lot of funds from private entities as well.

We're mindful that we work with people and organizations that operate not just in both Canadian official languages.... We have a large immigrant community in the greater Vancouver area. We have first nations and indigenous entities that have elders who prefer to work in their native languages. We don't have the solutions for all of that.

We do our best. We do our utmost to be respectful. We are prepared to adjust and evolve to the best of our ability.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you again for your candour, Mr. Hwang.

You know, I am looking for solutions.

When the government grants you funding, does it ask you to embrace the values of equity, diversity and inclusion in your organization?

[*English*]

Mr. Jason Hwang: I would say that they don't ask us specifically, but my understanding is that those are standards we are asked to.... When we apply for a grant from federal sources, there are questions in those grant applications that we have to answer to do our best to report out on how we can meet those obligations.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Hwang.

Would you agree, in that case, that...

[*English*]

The Vice-Chair (Mr. Corey Tochor): Thank you so much. We are out of time unfortunately, Mr. Blanchette-Joncas.

We're now moving on to the NDP Member of Parliament, Mr. Cannings.

Mr. Richard Cannings (South Okanagan—West Kootenay, NDP): Thank you.

Thank you to both witnesses here this morning.

I'd like to start with Mr. Hwang.

Thank you for that passionate support you gave for citizen science. The allusion to hockey is useful, but I really....

This whole idea of Canadians who are out there.... So many Canadians enjoy being out in the world and doing various things, whether it's fishing, looking at birds or just being out on their boats. This concept of making sure that what they do...if we can just channel that into useful studies.

Your organization would like to know more about the environment and the habitat that salmon are using. How active are you in creating those programs? Let's say it's a program of measuring the temperature in creeks and rivers.

I assume those kinds of things are evolving all the time and being generated all the time by your organization. That's where this power comes from.

Mr. Jason Hwang: Mr. Cannings, I would say yes to that.

I would even just expand it a little bit beyond what typical people might think about when the idea is framed as citizen science. Citizen science is a nice way to frame it, but it can be even more than just science. It can be citizen stewardship and citizen participation. It can include doing things that one would frame under the approach of science.

Here at the Pacific Salmon Foundation, we don't do anything by ourselves. Everything we do is done in partnership and collaboration with others and with community organizations in particular. From our operational perspective, it is increasingly active in involving first nations communities and also the broad network of other stewards that really want to be involved in looking after the natural resources here in this part of the country.

Mr. Cannings, I would say that people like you, who have been advocates for natural resources, for transferring knowledge and for sharing that kind of information so that everybody can understand what we have in Canada, help us look after it better.

Mr. Richard Cannings: Thank you.

I'll turn to Dr. Moran and ask a more general question.

In working with communities, there seem to be two main benefits, at least the way I see it, with citizen science. One is the fact that we can gather vast quantities of knowledge across large geographical areas over long periods of time much more easily using citizen scientists and people who are volunteering their time. There's also this benefit to the communities and the people themselves.

I just wondered if you could expand on those two benefits and how the federal government specifically could benefit itself.

● (1135)

Dr. Kathryn Moran: Thank you for that question.

Because I work on the ocean and because we're all concerned about climate change—climate change will be impacting our coasts first—I do think that expanding the citizen science along the coast will be beneficial to the country for gathering situational awareness and information about our coastlines.

One suggestion could be that, for funding programs where there's competition, like other elements that can be contributed, there could be...not a requirement, but a higher ranking for proposals that incorporate a citizen science program in some way.

I'll say just one other thing. Working with indigenous communities has shown us that there is indigenous knowledge that we can bring together with the new data that's collected. We've been learning a great deal about the longer history of changes in our coastal ocean because of that partnership. There's even more knowledge that gets brought to everyone's attention as we do that work.

In terms of the communities, the science technology and exposure to scientific methods and techniques is very exciting for the youth of these communities.

I'll just share one anecdote. In Cambridge Bay, one of the first youth who participated with us in 2012 graduated from high school, focused on science and now works in science in the Government of Nunavut.

We're seeing the benefits of the work that we do together with the people in these communities, which then increases capacity.

Mr. Richard Cannings: How much time do I have?

The Vice-Chair (Mr. Corey Tochor): You have 41 seconds left.

Mr. Richard Cannings: I'll just turn it back to Mr. Hwang.

Can you talk about the benefits to the citizen scientists and to the government, as well? We need the data that your people could collect. There's that sort of dual benefit and the government can take advantage of that.

The Vice-Chair (Mr. Corey Tochor): Answer within 15 seconds, please.

Mr. Jason Hwang: In short, there's a big exchange. It's a two-way relationship. The citizen scientists gain by being involved. Those who can use the data and apply it to the decisions and things that they have to do also gain.

It's very much a co-benefit relationship, in my opinion.

The Vice-Chair (Mr. Corey Tochor): Thank you kindly.

Now, moving on to the five-minute round, we'll start with Mr. Mazier.

Mr. Dan Mazier (Dauphin—Swan River—Neepawa, CPC): Thank you, Chair. Thank you to the witnesses who have come out today.

I have just a quick question. Do you know if citizen science includes non-profit conservation organizations?

Dr. Hwang...or Mr. Hwang.

Mr. Jason Hwang: I wasn't a super good student at university, so I don't get to call myself doctor of anything.

I tend to look at the idea of citizen science as an idea. When I relate to it, I don't necessarily draw super sharp boundaries around it.

I would say that in our organization, the people who work here are professionals. We have people with their Ph.D.'s, master's and regular old educated people like me, but we work with a vast network of people who I would characterize as “citizen scientists” because their day job isn't necessarily to do science on behalf of some activity or some endeavour, but they're willing to take part of their day or part of their week to do something that helps contribute to the networking capacity that we can harness to do a better job of gathering information that helps to inform some of our science-based questions and issues.

Mr. Dan Mazier: Is your organization considered a non-profit conservation organization?

Mr. Jason Hwang: I think most people would describe it that way, yes.

Mr. Dan Mazier: Well, it either is or isn't.

Mr. Jason Hwang: Well, we're a non-profit. Whether you would call us a “conservation organization” or—

Mr. Dan Mazier: On the Prairies we have organizations like Delta Waterfowl.

Dr. Moran, do you have any comments on that?

Dr. Kathryn Moran: Are you asking if Ocean Networks Canada is a conservation organization? Can you clarify the question?

● (1140)

Mr. Dan Mazier: Do you consider non-profit conservation organizations to be part of citizen science?

Dr. Kathryn Moran: I think those organizations do have citizen science programs.

At Ocean Networks Canada, we're a non-profit. We don't consider ourselves a conservation organization. We operate infrastructure for scientific purposes and we are basically agnostic on issues but of course keenly interested in the important issue of our time, which is climate change.

Mr. Dan Mazier: Okay.

Thank you.

I'll give the rest of my time to Mr. Lobb.

The Vice-Chair (Mr. Corey Tochor): Mr. Lobb.

Mr. Ben Lobb (Huron—Bruce, CPC): Thank you, Mr. Chair.

For both our guests here, it may seem like a peculiar question, but who actually owns the data that is collected?

Maybe Ms. Moran could start.

Dr. Kathryn Moran: That's a great question.

With each of the communities we work with, we have an agreement. In some cases the communities want to be the owners. We have an incredibly rich data system that follows strict principles, fair care OCAP principles, to ensure that, for example, if the indigenous community wants to own that data, we work with them to follow the OCAP principles to ensure that we respect and share those data in ways that are basically controlled by them.

Some organizations are happy that Ocean Networks Canada, as a society, owns the data, and we, then, follow our fair principles, which are international principles on data capture, archiving and accessibility.

Mr. Ben Lobb: Jason.

Mr. Jason Hwang: I would say that my response would be aligned with Dr. Moran's.

On projects that we are involved with, I can give an example. We are operating a data system that has information on salmon populations and their habitat. Some of that data is pulled in from federal and provincial government sources. Some of it is generated by community sources. Some of that community information is first nations community and local indigenous knowledge.

Some of those indigenous entities are very comfortable with the information they provide being displayed publicly on our system. But our system also has capacity to have their information displayed only when they are comfortable sharing it, so they get to turn it on and off.

The suite of data we have in our system is a combination of publicly available data and data that is being derived from local sources. Some of that is broadly public and for some of it there is more limited access.

Mr. Ben Lobb: Thank you.

The Vice-Chair (Mr. Corey Tochor): Thank you to our witness and to MP Lobb.

We are now moving on to MP Lauzon.

[*Translation*]

Mr. Stéphane Lauzon (Argenteuil—La Petite-Nation, Lib.): Thank you, Mr. Chair.

I'd like to thank the two witnesses who are here today.

You talked to us a lot about partnerships with organizations and citizen participants. You also talked about collaboration with the indigenous communities.

I saw something special happen this year in Quebec: on January 23, the City of Victoriaville was one of the first cities with a population of 50,000 and under to create the position of municipal science advisor. So I wonder about something.

Given that municipalities and indigenous communities are the ones that know their jurisdictions and the bodies of water located there best, would it be a good idea for the federal government to encourage the other municipalities in Canada to create that kind of position?

Ms. Moran, you can answer first, if you like.

[*English*]

Dr. Kathryn Moran: That's a wonderful question. I would say that would be a wonderful thing to do. From our experience working with indigenous communities, there's a very big discrepancy among those communities. For example, some have the capacity to invest in scientific studies to identify their priorities and what they need to do to protect their own coastlines. Others don't.

However, if all of them had the potential to have scientific advisers—even non-indigenous communities, as well—it would be of great benefit. The programs could be launched with a much more focused directive in terms of what the priorities and needs are. As Jason mentioned, the benefits back to the community would be much stronger.

● (1145)

[*Translation*]

Mr. Stéphane Lauzon: What do you say, Mr. Hwang?

[*English*]

Mr. Jason Hwang: I would agree entirely with what Dr. Moran just said. I'll add a bit, in that I think it's a wonderful idea.

I would highlight that one of the most useful things that can be done to support science is to help people understand and interpret it. Science itself is a method. You ask a question, you do a study and you get some results. However, what do you do with those results, and how do you interpret and apply them to issues that are important, and to important decisions that you have to make?

I admire the community of Victoriaville for having the foresight to appoint a science officer. I think that's wonderful. I'd like to see more more of that, but not just at the municipal level.

Helping all entities better understand the science and interpret it so that they can use that information in the most informed and thoughtful way would be excellent.

[*Translation*]

Mr. Stéphane Lauzon: Your organization has an exceptional number of volunteers.

What ties do you have with the municipalities, and what can they contribute in terms of these independent researchers?

[*English*]

Mr. Jason Hwang: It's variable. I would say that for the most part—at least in the work that I'm very familiar with, which is around salmon—most municipalities that have salmon within their jurisdiction or area are very interested in the salmon resources. Salmon are in their rivers, their lakes and their streams. These are important areas to our communities.

I would say, though, that the support is ad hoc. It's not structured. There's a sense of a value and an appreciation for the work that's done, but I think there's a lot more that could be done in helping from the municipal level to identify what the priorities are in that municipality.

How could local, municipal governments develop just a bit of structure, as I was speaking to in my opening comments, to help let their citizens know what they can use help with, how we can help them and what can we do with that information to turn that into something?

I think the openness is there, but I don't think it has been activated as well as it could have been.

[*Translation*]

Mr. Stéphane Lauzon: Thank you.

[*English*]

The Vice-Chair (Mr. Corey Tochor): Thank you so much.

Now we'll move on to our two-and-a-half-minute rounds. We have, from the Bloc, MP Blanchette-Joncas.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Chair.

My questions are for you, Ms. Moran. Thank you for being here for this important study.

I have taken a look at your organization, which I think is extraordinary. You have a lot of competencies and knowledge, particularly when it comes to marine geotechnics and marine tectonics. I commend you for that and applaud your organization's mission.

Ms. Moran, I have visited your organization's website and skimmed through the annual reports. I noticed that your website is not fully translated into French. However, I want to commend the efforts made by your organization. It states that the French translation is "coming soon". I would like to know how much time "coming soon" equates to.

Ms. Moran, with respect, your organization receives an enormous amount of money from the federal government. We are talking about funding of over $25 million dollars in a year, which is not a trifling amount.

I am humbly wondering: how many million dollars do you need to maintain an internet site, and publish communications, in both official languages?

[*English*]

Dr. Kathryn Moran: We have been slow at translating everything in both official languages. For example, we have had this as a priority. You can say that $25 million a year is quite a large sum. To give you context, we are equivalent to a U.S. observatory, and their funding is about one third greater than ours. We are very efficient and good at what we do. Of course, we are dedicated to making that happen soon.

Our new funding will start April 1 of this year from the Canada Foundation for Innovation. In our proposal to them.... For example, when we put a proposal in, we identify all the aspects that we need to do to move forward. There has been no full requirement for this, but, in our proposal this time, we've included that. That's why it says "coming soon".

We're going to continue to move forward with that. We're getting great advice—

● (1150)

[*Translation*]

Mr. Maxime Blanchette-Joncas: Ms. Moran, forgive me for interrupting you, but I am running out of time.

I note that your organization obviously embraces the values of equity, diversity and inclusion.

When it comes to linguistic diversity, is the presence of French included in your priorities?

Do you embrace that too?

[*English*]

The Vice-Chair (Mr. Corey Tochor): I'm sorry; we're over time on that one.

Dr. Kathryn Moran: Absolutely. Yes, and we'd love to talk more about that.

The Vice-Chair (Mr. Corey Tochor): Submit a response to that question, if you would.

Now moving on the final two-and-a-half-minute spot, we have MP Cannings.

Mr. Richard Cannings: Thank you.

I'd like to turn to Dr. Moran again, this time talking about big data.

You mentioned 1.2 petabytes. We hear a lot about gigabytes and terabytes, but you don't often hear about petabytes. I'm curious.

I have to say, my nephew, JJ Carr-Cannings, was an intern with Ocean Network Canada in software. He's some big data software engineer, so he was working on that.

I'm wondering about that data, where it goes, who has access to it and how it's used. I assume it's open-source data and that scientists from around the world can access it. Can you perhaps give us some examples of how that's used?

Dr. Kathryn Moran: We measure everything from temperature to video data of the deep sea. The data are openly available for the most part except for indigenous communities who want to protect their own data. Most of it is open data following the federal government's policy. It's used by educators, scientists, policy-makers and citizen scientists.

They can analyze the data to understand things like climate change, seismicity and tectonics or the chemistry of the ocean. Those are examples of the scientific benefits. We have been putting together materials that are important for educators in schools, packages of information that get shared and are easy to use by teachers. We have packages that are very simple to use by communities that capture their own data.

We are working hard at ensuring that the data are available and easy to use for every kind of user of ocean data. I have to say that we have been growing our user base internationally. About 50% are Canadians, but 50% are international, and that's because the particular footprint of monitoring we have is the most diverse range of marine environments of any particular location on the planet, so we can understand many aspects of the ocean just from our data archive.

What's coming up is using the data for advancing machine learning and learning more about the ocean through implementing machine learning and artificial intelligence.

The Vice-Chair (Mr. Corey Tochor): Thank you so much.

We are out of time.

I will say a big thank you to our witnesses and to members for the questions posed, and we will now suspend briefly before moving on to our next panel.

● (1150)

(Pause)

● (1155)

The Vice-Chair (Mr. Corey Tochor): I call this meeting back to order.

I would like to make a few comments before we start the second half.

For people who are taking part online, just remember that for interpretation you have the choice at the bottom of your Zoom screen of either the floor, English or French. For those in the room, can you please use your earpieces and select the desired channel.

I will remind you that all comments should be addressed through the chair.

Now I would like to start with our presenters for five-minute rounds.

I will ask that you do your best to keep within five minutes. If you're nearing the end of the five minutes, I will let you know to wrap up.

To start off for the first five minutes, we have Mr. Nadeau.

● (1200)

Mr. Patrick Nadeau (President and Chief Executive Officer, Birds Canada): Thank you so much, Mr. Chair.

[*Translation*]

Good afternoon, members of the committee.

Thank you very much for inviting us to this meeting. We were very pleased to accept.

My name is Patrick Nadeau. I am the president and chief executive officer of Birds Canada. With me today is Jody Allair, our director of citizen science and community engagement.

Birds Canada is a national not-for-profit organization. For more than 60 years, we have driven action to increase the understanding, appreciation and conservation of birds in Canada.

This morning, looking out the window, I saw a chickadee holding its own in our Ottawa winter climate. Many people in Canada did what I did, since, according to Statistics Canada, almost 10 million Canadians have at least one bird feeder at home.

Birds are dear to our hearts. For many of us, they offer a wonderful gateway to nature.

Unfortunately, it is alarming to learn that we have lost nearly three billion birds in North America since 1970, or almost one bird out of three. This decline shows the global effects of the converging climate and biodiversity crises. Our ability to determine the extent of these declines is largely due to the work done by the people we call citizen scientists.

Birds Canada manages 44 citizen or participatory science programs that involve over 74,000 volunteers, or the equivalent of almost 2,000 professionals working full-time. To our knowledge, this is one of the largest citizen scientist networks in the country.

● (1205)

[*English*]

With partners, Birds Canada collaboratively manages such programs as eBird, which had over 1.75 million checklists submitted in 2022 alone, or one of the longest-running citizen science programs in the world, the Christmas bird count, which engages tens of thousands of volunteers every year.

Citizen science is accessible to all, from neophytes to experts. Beginners can participate in Project FeederWatch and report the birds that they see in their backyards. At the cottage, perhaps, they can participate in the Canadian lakes loon survey, which tells us how our emblematic loons are faring across the country. More seasoned birders might participate in provincial breeding bird atlases. These are comprehensive bird surveys, kind of like the census we do for humans. By comparing the results of atlases conducted at 20-year intervals, we gain understanding of the changes affecting an entire region. Such an undertaking would be simply impossible without the contribution of citizen scientists.

Enthusiasm for citizen science is increasing. We know this, because we see it in our numbers, with record-high participation in our programs, growing steadily every year. Citizen scientists help deliver real scientific and conservation impacts. In 2021-22, data from Birds Canada programs were used for 533 peer-reviewed publications. Citizen science data also helped to identify Canada's key biodiversity areas, which were officially launched this past year, and to produce such crucial report cards as “The State of Canada's Birds”. The list goes on and on.

Citizen science does more than just generate data. Volunteering as citizen scientists strengthens our connections to nature. It gets us outside, with great benefits for physical and mental health. Perhaps most importantly, citizen science can be a gateway to greater engagement with the issues in our communities.

Many of the citizen science programs at Birds Canada have been supported by the Government of Canada. For this we are very grateful. Our programs directly contribute to federal objectives and mandates, such as conserving migratory birds. We have a strong track record of leveraging government investments, more than doubling these contributions through private gifts—including, in fact, many charitable donations from the citizen scientists themselves.

We hope that by now it's clear: We believe citizen science is essential, and we want to see it continue to flourish in this country.

With that, we'd like to leave you with three short recommendations aimed at the federal government.

Our first recommendation is to invest, of course, in citizen science programs, including their backbone infrastructure. By that we mean the tools needed for these programs to work effectively in that scale—for example, the modern technological and marketing tools needed to communicate with thousands of volunteers. Perhaps this is something NSERC could support as part of its mandate to promote science to Canadians.

Our second recommendation is to support more citizen science opportunities at federally managed sites—for example, Parks Canada's proposed network of new urban national parks. This would provide co-benefits for human health, and engage visitors in conservation action.

Our third recommendation is to continue support for citizen science programs focused specifically on birds. Birds are recognized as indicators of the state of our environment and are very cost-effective to monitor.

Remember those 10 million Canadians who have backyard bird feeders? To us, there is no doubt that among them we have the citizen scientists of tomorrow. We just have to show them the way.

Thank you so much.

The Vice-Chair (Mr. Corey Tochor): Thank you so much.

We're now moving on to Dr. Reynolds.

He wins the backdrop award for the best backdrop on Zoom today.

Dr. Reynolds, you have the floor.

Dr. John Reynolds (Professor of Ecology and Conservation, As an Individual): Thank you very much, Mr. Chairman.

I appreciate the invitation to speak to you today. I'm coming to you from the traditional territory of the Coast Salish people in southwestern B.C.

I'm a professor of conservation biology at Simon Fraser University. I've also just recently finished four years as the chair of COSEWIC, the Committee on the Status of Endangered Wildlife in Canada. That has given me a vantage point to see how we can use the power of citizen science for conservation assessment. I'm going to speak a little bit about that.

First, I just want to give you an idea of the scope of what we're dealing with. Increasingly, we tend to call citizen science “community science”, but it is the collection of scientific information by volunteers. As Patrick Nadeau said, it's not new. It's been going on for a long time. What is new is the availability of online platforms that can collect this data and display it back to people in a very friendly and useful way.

I'll pick up on this comment about eBird, which is an online portal where birders can submit their checklists. As of right this second, around the world, 16,826 checklists have been submitted to eBird. That's today—over 16,000 checklists. That's not even on a weekend. The power of citizen scientists to collect huge amounts of information really shouldn't be underestimated.

I particularly wanted to speak about iNaturalist, because it is really a game-changer, in my opinion, for citizen science. Unlike eBird, it collects data on all species—plants, animals and fungi. It's based on photos. You can upload a photograph of any species and get it mapped on the platform, and then iNaturalist will even use artificial intelligence to suggest what it is, if you don't know. Others can see your observation. They can chime in and help with your observation.

The New York Times recently had an article in which it called iNaturalist “The Nicest Place Online”. That's because people are very supportive and they encourage each other to learn to identify things and they celebrate their successes when they find interesting species.

In Canada, nearly 10 million observations have been submitted to iNaturalist. That means photos, audio or both. For the whole planet we have 2.5 million people registered with iNaturalist. They've submitted 126 million observations. The use of the site has tripled in the last three years. It is now the biggest citizen science platform in the world.

I want to spend a little bit of time now, for the final part of my talk, just to give you examples of what we can do with this information. You heard some examples from Patrick Nadeau and earlier from Jason Hwang.

I'll give you an example. I'm the co-leader of a program that promotes the use of iNaturalist to do biodiversity surveys in provincial parks in British Columbia. The other co-leader of this program is Dr. Brian Starzomski from the University of Victoria. We're doing this as volunteers. We've partnered with the Province of B.C. through their BC Parks agency—which is funding us—to hire teams of students. We send them out across the province camping in provincial parks and taking an average of 1,000 or 1,500 photographs every day.

These are some of the best young naturalists in western Canada. These are really the best of the best. It is the best job in the world, as you might imagine. We have been able to choose from very good naturalists. We're mentoring them. They're exploring nature. We do the occasional bioblitz as well to promote the use of citizen science for people to engage with nature.

The other example I can give you is from my past work with COSEWIC. We are the federally mandated body of volunteer scientists who assess the status of species for potential inclusion in the federal Species at Risk Act. COSEWIC's status reports are increasingly being populated with data from citizen science—especially on birds, to a very large extent. There are many others as well.

Actually, iNaturalist is very prominent in this. We refer to iNaturalist all the time to discover where species are and what their distributions are. These are key things that we can use to try to help assess their status.

● (1210)

I'll just conclude by saying that I think federal support could operate at the grassroots level by sponsoring bioblitzes to engage people, and also at the upper level with places like NatureServe Canada, which promote and disseminate citizen science information.

Thank you very much.

The Vice-Chair (Mr. Corey Tochor): Thank you kindly to both of our witnesses.

To start off our six-minute round, we have, from the Conservatives, member of Parliament Mr. Mazier.

Mr. Dan Mazier: Thank you, Chair.

Mr. Nadeau, in your opening remarks you referred to the seventies, and how many birds have been lost since then. How far back does that data go, and why the seventies? I've heard many organizations refer to those days.

Mr. Jody Allair (Director, Community Engagement, Birds Canada): I'll take that.

1970 is the nice round number where a lot of the earliest best data really comes from. A lot of that is breeding birds survey data. That's one of the federal government programs administered by Environment and Climate Change Canada, and is one of the key citizen science bird monitoring programs in North America. From 1970 onward, that's where we have a huge increase in the number of datasets we can use to pull significant results from. Generally 1970 is that benchmark going back, and lots of studies you see don't often go too far before that, although there are datasets that go longer. The Christmas bird count dataset, as you heard from Geoff LeBaron on Tuesday, is over 100 years old. Within our own database, we have data from Canada going back over 120 years.

Mr. Dan Mazier: I would be interested in that. Perhaps you could provide to the committee the datasets from citizen science versus government scientist science. How do those overlap, and over the years how has that evolved? How is citizen science becoming either more important to the program or less important?

Mr. Jody Allair: I would say it's definitely becoming more important, for sure.

Mr. Dan Mazier: If you could submit some data, some reports that you've done internally, that would be great.

Dr. Reynolds, you referred to eBird, which is a cool app, actually. I've been on it and trying to figure it out. You also talked about the data that comes in, and how many people you have submitting data. How do you ensure that's accurate?

Dr. John Reynolds: Individuals probably do make some mistakes, so the strength of that dataset is through the brute force of large numbers.

Mr. Dan Mazier: So there's no check on the system.

Dr. John Reynolds: Did a person really see six chickadees, or eight? Whether they had the right number of chickadees won't make a difference when you have this much data. It's allowing high-level visualizations of migration distributions, for example, things like that, even though individual records may well have errors. It's a good point, and it's something the scientists who analyze those data think about a lot.

Mr. Dan Mazier: We had CocoRaHS in here earlier this week, and they do have a regime of making sure the data is accurate before it gets put into ECCC. But there is no system in place to make sure that's actually accurate. You're just taking people's word for it.

Dr. John Reynolds: There is one other safeguard. I should explain that I'm not a birder, so I use the app, but don't have any involvement with the program itself. If somebody puts in something that is crazy, like they saw a dodo, or something like that, that will get flagged, and it will come to the attention of a regional reviewer, and they can ask them about it. That's an extreme example, obviously, but if it's something really out of place or a huge number of something that never occurs in those sorts of numbers, it does get flagged and the regional reviewer can ask them to correct it. If they don't correct it, the reviewer can simply remove that from the main dataset.

● (1215)

Mr. Dan Mazier: Okay. Thank you.

Going back to Birds Canada, you mentioned how your organization is funded. Could you expand on that, please?

Mr. Patrick Nadeau: Sure.

We're managing an overall budget of about $9 million at Birds Canada—and growing. We have six program areas. The program area where most of our citizen science work happens is called Assessing the State of Canada's Birds. That program area runs about $2 million to $2.5 million a year. The federal government is a significant contributor to that, and we're very grateful, but overall it's still less than half of that contribution. So, we have philanthropic contributions and lots of individual donors—and that's something that I think is really interesting to emphasize. In a charitable space oftentimes you'll hear that individual donors are the ones who are closest to the work. These citizen scientists are not only volunteering, but in many cases they're also financially contributing.

Mr. Dan Mazier: My Conservative colleague, Marty Morantz, introduced the supporting Canadian charities act last year. Bill C-240 would have incentivized Canadians to donate more money to charities such as yours, such as we're talking about. Experts projected that this legislation would have increased annual donations to Canadian charities by $200 million—$200 million—and, unfortunately, the Liberals and the NDP killed this bill by voting against it.

How important are charitable contributions to organizations like yours?

Mr. Patrick Nadeau: Those are vital contributions, and while I can't vouch for the fact that this would be the latest number, I would point out that the last I've seen is somewhere to the tune of four per cent. That's the slice of the pie that the environmental charitable sector receives out of all donations. Given the twin crises of climate change and biodiversity collapse, four per cent of the total pie is not a huge number so anything that charitable organizations can do to build momentum and build support from individuals, and to diversify their funding base, of course, is welcomed.

Mr. Dan Mazier: Great. That's it, Chair.

The Vice-Chair (Mr. Corey Tochor): Thank you so much to our witness and for MP Mazier's questions.

We're now moving on to MP Collins for six minutes.

Mr. Chad Collins (Hamilton East—Stoney Creek, Lib.): Thanks, Mr. Chairman, and thanks to the witnesses for your appearance today at committee.

I want to start with the technology that both organizations referenced. There was the eBird app that was referenced, and then, Dr. Reynolds, you talked about your iNaturalist app, which I really would have liked to have had a couple of summers ago when I walked into some poison oak.

In the context of building capacity amongst the citizen science community, what kinds of investments should the federal government be looking at in terms of the technology that you're using, not just to build capacity within the organization but to better gather the information and better track the data?

Dr. Reynolds, I'll start with you and then I'll turn it over to Mr. Nadeau and Mr. Allair.

Dr. John Reynolds: When we had Canada's 150th anniversary, there was funding—I believe it was federal funding—to sponsor bioblitzes. These are community events where people go out to try to find and photograph as many plants and animals as possible in a given period of time, like a weekend or a day or whatever, and iNaturalist is the go-to app for reporting on these.

I think that was probably very successful. Certainly there were a lot of bioblitzes that came out of that, and that's a way to engage people who otherwise might not have ever heard of a bioblitz. They might be people who like to go hiking or they're casually interested in the birds they see, but to actually get them out there with like-minded people, I think that can be a very good way to get people into it, and in fact, right now, internationally there's something called the City Nature Challenge. that iNaturalist runs on a long weekend once a year, and they see a big uptake in people who sign up for the app from that.

I think that's one way you can get to the grassroots level.

Mr. Chad Collins: Okay.

Monsieur Nadeau.

Mr. Jody Allair: I think investments in the infrastructure of these programs are obviously really key and at Birds Canada we have a variety of programs. We run 44 different citizen science programs and engage with about 74,000 volunteers every year, and in order to do that you do need proper infrastructure, everything from our database system, and we've got a very sophisticated database called NatureCounts. It's actually one of the largest biodiversity databases in the world. We house the data there. We have lots of training involved with all of our programs, whether they're structured or unstructured citizen science, aiming for that high data quality, which is obviously really important.

But all this takes funding and all this takes a lot of energy and a lot of expertise, to make sure not only are we providing the best experience for volunteers but also that we're collecting the best data to have the most impact on birds as possible.

● (1220)

Mr. Patrick Nadeau: I would just add that that's what we're getting at in our first recommendation when we speak of supporting the backbone infrastructures.

Just to give you an example, when these programs are successful and they're scaled, we're now talking about potentially thousands of Canadians who are participating in these programs. So imagine trying to maintain interactions and keep that many volunteers engaged. You need to have a back end that can actually automate some of these things or even just how do you send an email to 3,000 people to tell them when it's time to go monitor X species.

So that backbone infrastructure, oftentimes it's just an initial investment to set it up and then it can be used for many years and for many programs, but there is this behind the scenes work that needs to happen, especially if you're scaling these programs.

Mr. Chad Collins: Thanks for that.

I really liked your recommendation as it relates to access to federal lands. As a former conservation authority board member, I know there's a cost sometimes to visiting some of the best natural areas we have, whether they're in a municipality, a province or the country. I was very intrigued with your recommendation that suggests there be some support for federally managed sites. I think you could probably extend that to provincial areas, as well as local conservation authorities and parks.

Mr. Reynolds, on the recommendation that Birds Canada has provided, do you support that concept?

I read an article today in the local paper about the great backyard bird count that's coming for the Family Day weekend. I would use that as an example. If I was to suggest to my kids that we take some time out on Family Day to go out and undertake a count, there would be a cost for me to visit some local conservation authorities.

What role could the government play in reducing those costs and maybe breaking down some of the barriers that people have to natural areas?

I will ask that of you, Mr. Reynolds, and then I will go to Mr. Nadeau and Mr. Allair.

Dr. John Reynolds: For events like the great backyard bird count and the city nature challenge, which go on, these are generally not run at the federal level, although they could certainly benefit from federal funding. The way to reduce costs would be if there was some funding made available to make them happen. That is what happened during Canada's 150th anniversary. There was funding made available for people to do the organization and the advertising.

I don't know if people received...I don't think they were paying the participants per se, but they were certainly making it a lot easier for them to participate.

I'm not sure exactly what the barriers are that we're talking about for people getting access to lands. If I may clarify, are we talking about travel costs or camping? Is that the sort of concern?

Mr. Chad Collins: It's the cost of getting into a park and covering your admission to whatever area we're talking about.

Dr. John Reynolds: I see. I haven't really thought about it, to be honest, but if a national park or a provincial park wanted to do a bioblitz to encourage a very large number of people to come there, I wonder whether there could be some sort of subsidy for camping fees, or something like that.

E.C. Manning Provincial Park in British Columbia, which is one of our most popular parks, has various annual events encouraging people to come, and it might be possible that there could be some sort of reduction in fees to participate in them. It's something I haven't really thought through.

The Vice-Chair (Mr. Corey Tochor): Thank you, Dr. Reynolds.

We're now moving on to MP Blanchette-Joncas for six minutes.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Chair.

I would like to welcome the witnesses who are joining us for the second hour of this important meeting of the committee.

My first questions are for the representatives of Birds Canada.

Mr. Nadeau and Mr. Allair, thank you for being here in the room today.

Mr. Nadeau, I would like to commend your good track record when it comes to engagement. You have also created the largest network in the world of citizen scientists who take samples of microplastics in fresh water. I want to congratulate you and commend you for that. It is important. I am a firm believer in citizen science.

In your opening remarks, you talked about certain recommendations for infrastructure and managed sites that could certainly be managed by the federal government, and about support for citizen science programs.

I would like you to talk some more about potential federal government programs to support citizen science initiatives.

Myself, I am going to mention something that already exists, because we don't really need to reinvent the wheel. Since 2019, Quebec's Fonds de recherche has been granting funding under the *Engagement* program. It is an invitation to members of the public who want to carry out their own research, to encourage participatory science in the province. Unfortunately, there are few or no similar programs in Canada.

Of course we commend the progress made and Quebec's role in the vanguard of this. I would like to know whether we could draw on this model and then consider adopting it here in the federal government.

● (1225)

Mr. Patrick Nadeau: Thank you very much for your question. It's very interesting.

We believe that citizen science, participatory science, is science. The federal government has a mandate to promote science among the public, in particular through the Natural Sciences and Engineering Research Council of Canada.

Why not, then, have programs that would encourage citizen science? The Council is already doing this with school-aged children. Why not promote this kind of science among Canadians in general, not just children? I think it's a program that deserves to be adopted.

Mr. Maxime Blanchette-Joncas: Thank you.

Could you clarify your thinking on the other points?

You talk about infrastructure. In concrete terms, what could be done to try to support the rollout of infrastructure to stimulate and mobilize the citizen science community?

Mr. Patrick Nadeau: In this case, there is a lot of talk about digital infrastructure to support these programs. To give you an example, we are currently finalizing a platform that we will be able to use to provide training for a very large number of volunteers at the same time. It is a digital platform.

These days, a person can register to take courses online, but the technology has evolved significantly. This software is very expensive to buy. We need support for acquisitions like this. Typically, when we receive financial support to do participatory science, the funding is for one particular species, for example. There is really no thought being given to the infrastructure needed to support this. A lot of where we are lacking support is for what goes on behind the scenes.

Mr. Maxime Blanchette-Joncas: I understand. So you need financial support to install digital infrastructure, as you say, and then stimulate citizen science.

You talk about managed sites. I understand that these are sites that are managed for birdwatching, among other things. Can you tell us more about this, in concrete terms?

How could the federal government help you in your mission and, again, stimulate community engagement?

Mr. Patrick Nadeau: I believe we have to go out and meet the public.

At Birds Canada, we always say that birdwatching has to be accessible to everyone. There are several ways to approach the subject, but ultimately it comes down to reducing barriers to access. So we have to figure out what to do in order to reduce those barriers, particularly at sites managed by the Government of Canada. That can mean a very large number of things, such as offering programming for people who have never done it and have never thought about the idea of becoming scientists, for example.

So there has to be programming offered and it has to be shown that it is not just for experts with 25 years' experience. For people to be able to access these apps or this training, they really need to be made more accessible.

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Nadeau.

Earlier, we were talking about financial support programs for rollout of your activities in connection with your organization's mission. I refer to the Chief Science Advisor's Youth Council, which published a report in 2022 entitled "Our Vision for Science: Perspectives from the Chief Science Advisor of Canada's Youth Council" to set out what young people see as the priorities for science. You referred to this. However, we do not see many rollout measures occurring to stimulate citizen science with the help of certain federal government departments.

I am trying to see how to generate commitment on the part of the government and influence public policy to ensure that science is a priority, obviously, but also to be able to popularize science and then to educate and raise awareness on the part of the public.

Mr. Patrick Nadeau: We know that young people are amazingly interested. When we tell you about the people who work with us to expand participatory science, we include young people.

I can tell you about Gavin, a young boy we discovered in Alberta when he was eight years old and taking part in his very first Christmas bird count. Since then, as a volunteer, he has been coordinating a bird count in his region and he does revisions for the eBird database, which means he is one of the people trying to catch mistakes made by other amateur birdwatchers. He has done all this even before finishing high school.

We know there are young people who, like Gavin, just need a bit of leg up or a way in, to discover participatory science.

● (1230)

Mr. Maxime Blanchette-Joncas: Thank you very much, Mr. Nadeau.

[*English*]

The Vice-Chair (Mr. Corey Tochor): Thank you very much to both individuals.

I'm moving on to the last round of the six-minute spot, which is with MP Cannings.

Mr. Richard Cannings: Thank you.

I'd like to thank all three of you for being here. It's really great to see you.

I wanted to start by picking up on what Mr. Mazier was saying about quality control and dive it into that, because if we look at the programs of Birds Canada, for instance, there's some very impressive quality control that goes on behind the scenes. For full disclosure, I've been part of that for many years.

It's not only experts looking for things. Increasingly, with these huge amounts of data coming in, those controls and the limits of what you can report are being calculated by machine learning.

Maybe Jody could expand on that. What goes on behind the scenes with eBird, the Christmas bird count and other programs—in a quick manner—to make sure that we're getting good data?

Mr. Jody Allair: We have a real diversity of citizen science programs. Some are very structured and more rigorous, and others are more entry-level programs to engage the next people into science and citizen science. With all of those programs, a unifying factor is that data quality is taken very seriously. There have been hundreds and thousands of scientific papers published citing citizen science data. The reason for that is that it is now broadly accepted that this is high-quality data, and it has become a cornerstone in the biological field.

As an example of what we do internally for our programs, whether they're breeding bird atlases, the Canadian lakes loon survey or eBird—we manage eBird and the Christmas bird count in Canada—we use rigorously tested protocols. We provide intensive training, we incorporate data filters, we regularly review data quality and, very importantly, we implement onboarding for volunteers to move to more challenging programs as they go. All of this is to enhance the experience for the volunteers, but it also allows us to collect rigorous data so we can have an impact on birds. Especially with onboarding and getting more people to take on more complex citizen science programs, that enables us to collect even more relevant and more pertinent data to help make big conservation decisions.

Mr. Richard Cannings: Thank you.

Let me turn to Dr. Reynolds and ask the same thing about iNaturalist.

I know that it's one of your favourite platforms, and I have to blame you for getting me addicted to iNaturalist a few years ago during COVID. I went out with your team in provincial parks, and it was quite a life-changing experience, I have to say. I'll admit to having taken a picture of a centipede in a briefing meeting in the Confederation Building to find out what this huge centipede was that was crawling around the floor.

To get back to quality control, one of the many fascinating things about iNaturalist for me is that, when you post your pictures on iNaturalist, iNaturalist will take an AI guess as to what it is. Almost immediately there are experts from around the world who will come in and say, “No, this is such and such” or “Yes, you're right”. These are citizen scientists who are real scientists who are volunteering their time to make sure that quality control is there, and they're gaining so much. It's amazing that iNaturalist is expanding this knowledge of little-known species because there are so many people involved.

I don't know if there's a question in there, but would you expand on that aspect of experts' being part of that?

Dr. John Reynolds: Yes. The reason the New York Times said that it was one of the nicest on-line platforms was the way that people support each other and help out with that. We've all experienced all kinds of examples of things that we have misidentified, put it up as something else, and then it gets corrected quite quickly in a very supportive way.

I once found a small orchid in Yukon that I called a common species, and a high school student in the eastern U.S. said that it was such and such. It turned out that it was a new record of that orchid for Yukon. To be corrected by a kid in high school is a pretty neat experience, because it shows you the level of quality control that goes on.

Studies have shown that eventually most errors do get corrected. Because there's a photo or an audio, anybody can evaluate the evidence and straighten it out. Again, it's great for discovering species that aren't where we thought they were, but, again, you can look at widespread distributions increasingly well now. It doesn't matter if there's the odd error there; it's still gives you the range map.

● (1235)

Mr. Richard Cannings: I have 30 seconds.

Can you continue and say a bit more about how iNaturalist itself is funnelling into COSEWIC, which hasn't had too much data from obscure species until now, and I'm guessing it's been a bit of a game-changer there, too.

The Vice-Chair (Mr. Corey Tochor): Answer within 10 seconds, please.

Dr. John Reynolds: In the last few years, about 10% or 15% of our status reports use iNaturalist data. It's the first place people often go when they're trying to decide whether it's worth paying attention to a potentially threatened species.

The Vice-Chair (Mr. Corey Tochor): Thank you so much.

We'll move now to the five-minute round, beginning with member of Parliament Ben Lobb.

Mr. Ben Lobb: Thanks very much.

To both organizations, when you do a publication or produce a report, how do you decide what you're going to include in that report? Is it a board that decides? Is it staff who decide? Is it the funding agency that decides what you're actually going to put together in a report or what have you?

Dr. John Reynolds: Go ahead, Jody.

Mr. Jody Allair: It's great to see iNaturalist featured here. We're all addicted.

To interpret your question about reporting, we report on all our birds on a very regular basis through program reports. All our data also gets contributed to “The State of Canada's Birds”, a report that comes out every few years. It's sort of the health card of our bird populations. I highly recommend reading a copy of that report, because it is a real wake-up call as to how in trouble Canada's birds are.

We also do a lot of reporting through published academic papers. Just to give you an example, from 2021-22 Birds Canada's data information has been used for 533 peer-reviewed publications. The bulk of that is citizen science data that's being used. As well, 121 were particularly pertinent to understanding climate change impacts on biodiversity.

So we do report regularly. It's very important for getting awareness out on the issues, but it also underpins one of our core values, and that is open data. We help collect and we help create programs where volunteers can collect rigorous data. Then we do our best to make sure that data is out there and open and accessible so that everyone can use it to make conservation decisions, whether you're publishing a paper or making a change in policy.

Mr. Ben Lobb: John, is it about the same for you folks as well?

Dr. John Reynolds: It's a little bit different. For COSEWIC, speaking on behalf of COSEWIC, there the.... I guess in some ways it is similar in that the scientists on the committee will decide what are the best data that we need in order to understand what the status of the species is. Those data are very often, as we've heard, citizen science data. In the case of birds, there's citizen science data in just about every single status report we ever do on birds. Much of it is of the kind that you've already heard about.

As a research scientist, there I have.... Well, it's a similar sort of decision. It's something that I and my co-authors would do. We'd say, "Are these the right data to answer our question?" Then we'd just make that decision on our own.

● (1240)

Mr. Ben Lobb: The other thing is that "The State of Canada's Birds" was published in 2019, I think. I can't remember if it was John's organization or yours that did that report. When you look at a report like that, there are a lot of comments in there about agriculture and pesticides and things like that. That's fair enough, but I think there wasn't a whole lot of information on the true impact of urban sprawl.

There's another thing that I'm curious about. When you're looking at these things...and maybe this is beyond the scope of what you folks are focused on. In the area that I represent, there's got to be about 300 or 400 wind turbines that weren't there 20 years ago. Of course, my area is right along the Great Lakes. There's agriculture, there are woodlots, and there's really no mention in that report.... That's fair enough; maybe it's beyond the scope.

With things like urban sprawl and areas where there are lots of wind turbines that do impact bird populations and migratory flow, is there any thought given to including that in another report or to stating the impact of that? I'd be curious to know what either one of you thinks about that.

Mr. Jody Allair: I can go first.

There are a variety of impacts that affect birds.

There was a publication in Avian Conservation and Ecology, which is the journal that we co-publish here in Canada, looking at human-caused mortality factors of birds. It did document all the biggest mortality factors facing our birds, from a human perspective.

Transmission-line collisions and wind turbines were certainly on there. The most significant, though, are free-roaming cats—outdoor cats kill about 100 million birds per year in Canada—and window collisions. On average, window collisions kill 25 million birds per year in Canada, whether that's through lights being left on when they shouldn't be or bad building code designs that aren't in place for proper window fittings.

The big challenges those reports deal with are climate change and habitat loss, which are another level of threat facing a lot of these birds. The "State of Canada's Birds" report is a distillation of the numbers. It identifies the groups of birds that are most affected. It is then our job to follow up to find the correlating factors for those declines.

The Vice-Chair (Mr. Corey Tochor): Thank you kindly.

We'll now move on to the last member of Parliament for—

Mr. Gerald Soroka: I think Mr. Nadeau may have a written submission to that answer too.

The Vice-Chair (Mr. Corey Tochor): Mr. Nadeau, if you have a desire to submit a written response, you can as well.

We go to the last member to question in this round, MP Sousa.

Mr. Charles Sousa (Mississauga—Lakeshore, Lib.): Thank you.

I appreciate all of your being here and making your presentations.

Mr. Reynolds, when you reference this international engagement, with all of these hits happening on the website, you are talking about the e-platform for iNaturalist. Is that what you're talking about? Is that where all that incoming data is coming from?

Dr. John Reynolds: The example of incoming data I gave you was from eBird, which is the standard global platform for submitting checklists of birds.

I told you that 16,000 checklists had been submitted today, but that's out of date. It's now 18,400, so 2,000 more have been submitted in the time we've been speaking.

Mr. Charles Sousa: Who actually funds it? Who manages that? Who pays for it?

Dr. John Reynolds: It's run out of Cornell University, and they fundraise for that.

Mr. Charles Sousa: I see that iNaturalist is by California and National Geographic. I believe I just saw that on the website. There's a lot of international engagement.

Before, you were asking us to support Canadian-made and these presumably have some intellectual property, some value.

I'm interested in the Canadian content and continuing to promote a number of areas.

When I lived in Toronto, we used to have these hawks—yellow tailed or red tailed—perch themselves on our window sills and they'd bring their kill. I can't recall which is which. It was amazing to watch. There was a family of them right at Queen's Park, nestled in there.

There are the peregrine falcons that some of the cement plants down in Mississauga are trying to protect. There are even Zenaida birds—those doves that show up in certain parts. They're beautiful and they nestle together.

To your point, I do appreciate the work you're doing and appreciate then seeing some of this wildlife in our backyards and our community. In the Rattray Marsh Conservation Area, where I live, there are bird watchers everywhere. It's a big deal.

Patrick, you were mentioning breeding. Ben Lobb was talking about the urban situation and the stresses that's bringing upon us, eating away at some of this area for breeding capacity. What are we doing then? How is it that we're promoting education or enablement for some of these birds to thrive?

● (1245)

Mr. Patrick Nadeau: It's a good question.

It connects back to Mr. Lobb's question about what drives our decisions about what we're going to do with all of this citizen science data, I think, at the end of the day, our organization exists to conserve birds and to recover these birds that are part of this biodiversity collapse.

We started today by telling you that we've lost three billion birds in North America since 1970. Those birds that you're describing, that you're seeing in Toronto, in Mississauga, we want you to be able to continue to see into the future, but the trends aren't looking good.

All of our citizen science programming is set up in such a way that the outcomes can influence conservation.

Just to give you one example, just recently, with the help of the federal government, we launched Canada's network of key biodiversity areas. These are basically like the crown jewels for biodiversity in Canada. These are the most important hot spots for biodiversity in Canada. We and our partners are able to map out where those places are directly because of citizen science.

Thanks to citizen science, we've now mapped out these key biodiversity areas, and those areas are now directly informing, for example, Canada's 30 by 30 target, which the world just agreed to at COP15. These are direct conservation impacts—real-world conservation impacts—that the citizen science data is having.

Mr. Charles Sousa: I mean, I look at urban sprawl. Certainly in southern Ontario with the stresses that it's bringing upon us with the Greenbelt now and the engagement, there are a lot of conservation discussions; a lot of people seem to be aware of it. How are we able to prescribe controls to support it? I mean, there's been a constant battle going on for centuries, obviously, and to your point since the 1970s, we have a massive reductions in birds and a huge increase in urbanization.

Mr. Jody Allair: Yes. Certainly, I can't really get into the specifics of how the sprawl's going to have particular impacts. Obviously, it's going to have very negative impacts. I think under the theme of citizen science, one of the solutions and one of the things we try to promote is engaging more people directly.

This is the beauty of citizen science: It helps us collect vast amounts of data of a really high quality to conserve birds, but it also gives people a glimpse of the scientific process and makes it accessible. However, the big one for me—and I think it touches on your question—is that it builds connections to the subject matter. It helps bridge that disconnect from the natural world, which is a big problem in our society. It creates a community of engaged volunteers.

The Vice-Chair (Mr. Corey Tochor): I'm sorry. We're out of time on this one, but you're more than welcome to write a fuller answer after the committee.

Now, moving on to the final round of two and a half minutes, we have MP Blanchette-Joncas.

[*Translation*]

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Chair.

I am going to direct my questions to Mr. Nadeau again.

In your presentation, you referred twice to a figure that we can't allow to go unnoticed and that no one can can help being affected by: in North America, since 1970, we have lost one bird out of four: three billion individual birds. That is huge.

That demonstrates the need to protect biodiversity and our ecosystems. One way of doing that is through science and citizen science, which we are discussing today. I commend your organization's efforts. I have looked at your various reports, and we can see that there has been extraordinary mobilization.

My question is very broad: what can we do, when it comes to public policy, to give you more help and to promote citizen science? How can we mobilize volunteers?

● (1250)

Mr. Patrick Nadeau: Thank you very much.

I can't talk about the loss of these three billion birds without getting shivers. We aren't talking about Jacques Cartier's day; we are talking about 1970. Some of us were here then. In not such a very long time, we have lost nearly a third of our birds. So we have to act. We know that human beings have contributed a lot to this decline, but we are also the ones with potential solutions.

Behind that downward trend, there are examples that give us hope. For example, in the case of the raptors, we have succeeded in reversing the trend. They are now in a better situation than in those years, because we have understood that certain pesticides we were using, in particular, were hurting them.

That proves that humans are capable of changing things, and that is directly connected with citizen science. We won't change the situation without involving the public. It takes people who have an interest in these issues and who understand them better because of their own participation.

Participatory science is science, of course, but it is also a matter of collective awareness.

Mr. Maxime Blanchette-Joncas: Thank you, Mr. Nadeau.

You are quite dynamic when you talk about public awareness and education.

I note that the podcast *The Warblers* is in English only. I am going to challenge you to produce one in French. We have 300 million French speakers on earth, so so I imagine you could certainly find ears that would listen attentively to what you are saying. The podcast, which I do promote, has risen in popularity worldwide and is ranked among the 100 best podcasts. That is pretty unbelievable, so I congratulate you.

I also note the extraordinary mobilization and participation rate in your organization. You talked about an eight-year-old boy who had participated in the big count. There has been a 25 per cent increase worldwide.

Can you tell us your tips and success stories? What do you do to encourage people to participate in citizen science?

Mr. Patrick Nadeau: That's good timing, because...

[*English*]

The Vice-Chair (Mr. Corey Tochor): I'm sorry. We're out of time on that; we're over by 20 seconds already. If you want to make a written submission, you can.

Moving on to the final spot, we have Mr. Cannings.

Mr. Richard Cannings: Thank you.

I'll let Monsieur Nadeau continue, but what I want to focus on is that process. You know, we have the monitoring inventory process that a lot of this citizen science gathers big data for where we get the trends. Then in "The State of Canada's Birds", for instance, we look at those trends and parse out what kinds of birds are declining, what kinds are increasing—you mentioned that raptors are increasing, for instance, and I know that grassland birds are decreasing and that birds that migrate to South America are decreasing—and how that informs the next step and who does that next step.

Mr. Patrick Nadeau: I can maybe start with one example really quickly. You mentioned grassland birds. They are among the birds that are declining the fastest, so once we know that, and we know that again largely because of citizen science, we know that grassland birds are declining so we focus our conservation efforts there.

One example recently is that we've been working closely with partners at the Canadian Roundtable for Sustainable Beef. We're working directly with the cattle industry and players in that industry who are using the data from citizen science and from this thing we call the Bird-Friendliness Index to actually inform their practices, so they are now on the ground as part of their sustainability framework, using data that comes from citizen science.

To answer your question, from my perspective it helps us to prioritize and direct our efforts and which stakeholders we're going to be engaging with.

Mr. Richard Cannings: I would just follow on that. The bulk of citizen science, in your organization at least, is informing that initial stage, the trends setting off the alarms and then other groups can take that, whether it be the federal government or provincial governments or municipal governments, and use that to inform whether its their conservation actions or to change other things they are doing.

Is that how it works?

Mr. Jody Allair: Yes, that's essentially how it works. Birds and birding are for everyone. Obviously, from my perspective—I've been a birder since I was a kid—birds are really important to me, but they're also extremely important indicators of environmental change on our planet. These types of programs are invaluable for understanding not only how birds are doing but how we're impacting our planet, and as John might attest, unfortunately a lot of the other taxa, as fascinating as they are, don't get that same kind of representation.

We have a lot of people who are interested in birds and birding and they want to give back, and citizen science and Birds Canada programs are a way to try to do that in Canada, to connect people with nature, collect data and do what we can to get that data out there so that we can actually conserve a lot of these birds.

We have some big challenges. Patrick mentioned birds of prey. We've done well at getting them back, dealing with the DDT crisis. We have about two, three or four DDT crisis-type events happening right now with climate change, with habitat loss, with pesticide use. There's a lot of work that we need to do.

Our role is to get that information out there so that work can be done.

● (1255)

The Vice-Chair (Mr. Corey Tochor): Thank you so much to our witnesses today.

Our next meeting is scheduled for Tuesday, February 14. The chair will have the clerk publish the notice soon.

Colleagues, with that, is there agreement to adjourn this meeting?

Some hon. members: Agreed.

The Vice-Chair (Mr. Corey Tochor): Seeing agreement, we stand adjourned until Tuesday, February 14.