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Chair

Mr. Harold Albrecht

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● (1530)

[*English*]

The Chair (Mr. Harold Albrecht (Kitchener—Conestoga, CPC)): I would like to call the meeting number 19 of the Standing Committee on Environment and Sustainable Development to order.

We're pleased to have with us today four groups that are going to provide testimony on our study on Great Lakes water quality.

Welcome Mr. David Sweetnam, executive director, Georgian Bay Forever.

We also have here Jan Ciborowski, professor, University of Windsor; from Ducks Unlimited Canada, James Brennan, director, and Mark Gloutney, director; and from the Sierra Club of Canada, Mary Muter, vice-chair.

We're going to proceed in that order unless you have agreed to a different order.

We'll begin with Georgian Bay Forever, Mr. David Sweetnam, please, for a 10-minute opening statement followed by the other testimony and then two rounds of questions.

Welcome.

Mr. David Sweetnam (Executive Director, Georgian Bay Forever): Thank you, Chair.

The effects of climate change are widespread and consequential. Fast-acting institutions, elastic regulations, and early-warning systems are needed as part of an adaptive management process to address these changes.

But according to the United Nation's climate change report released yesterday the scale of climate-change harms are expected to be so overwhelming that mitigation measures will be necessary to avert the greatest risks. In response to the report, Secretary of State John Kerry said, “Unless we act dramatically and quickly, science tells us our climate and our way of life are literally in jeopardy.”

This is a warning and a significant call to action.

The environmental side effects of climate change—from water quality to invasive species, water levels and habitat erosion—are alarming. But the associated economic impacts could be in the billions, with major harms caused to tourism, property values, shipping, and other key industries. More research into these economic impacts is necessary, but the environmental harms are already clear.

Chair and committee members, Georgian Bay Forever is pleased to have been invited to present to the committee and to bring you observations and recommendations to assist you with your work to protect our water quality, sustainability, and the environment in the Great Lakes region.

Georgian Bay Forever is a charity founded almost 20 years ago, with a focus on contributing to the scientific understanding of Great Lakes aquatic ecosystems and to providing balanced information to better inform the public. You have already heard testimony from a variety of researchers that Georgian Bay Forever has funded or worked with over the years.

Our Great Lakes aquatic ecosystems continue to face severe threats. A variety of interventions like stocking exotic species to control alewives and an ongoing annual $30-million investment in chemical and biological sea lamprey control merely prop up failing systems. Most recently, zebra and now the quagga mussels that have replaced them have stripped the food web at its base, resulting in a further decline in fish biomass as the Diporeia populations that the fish feed on have plummeted by 95% since the year 2000.

The UN report supports what we are already seeing in the Great Lakes, predicting that a “large fraction” of freshwater species face a growing risk of extinction and that the global stock of fish will decline by the year 2100.

Biologists tell us that amongst numerous other fish communities there used to be 12 distinct varieties of lake trout in Lakes Michigan and Huron and of those only two remain today. In Georgian Bay we have one of the only self-sustaining populations of that native lake trout found outside of Lake Superior and in this handout, which I believe you have, you'll see a picture of me holding one of those fish in this picture.

We are only just beginning to understand the role that climate change is playing in relation to our Great Lakes water quality and quantity. Increasing rainfall from more intense storms has lead to increases in untreated sewage releases, and runoff of surface water contaminated by lawn and agricultural fertilizers have been implicated in recent International Joint Commission reports of record level toxic and nuisance algae blooms in Lake Erie.

But those blooms are not restricted to Lake Erie. Sturgeon Bay in the Pointe au Baril area of eastern Georgian Bay has restricted circulation with the outer waters of Georgian Bay. You'll see a slide on page 2 of the impact in that area. It's very similar in that area to the impacts that Lake Erie is seeing. Water cannot be touched let alone used for drinking due to smell, taste, and possible toxicity.

Georgian Bay Forever has funded studies into what is causing these algal blooms and our DNA bar-coding technique has been used for rapid diagnosis of these blooms to evaluate whether they are toxic.

Low water levels also contribute indirectly to the erosion of healthy ecosystems as water warms. Warmer water is a significant contributor to increased evaporation from the Great Lakes, even more than the less understood ice coverage that we saw this past summer. You'll see again in your handout that water levels today in Lakes Michigan and Huron are actually below what they were in April of 2012. That was the year that we had the all-time ever-recorded low water levels.

● (1535)

So despite what you've heard in the media, we're still not in great shape.

New and innovative tools, with shorter response times and better resolution, will be needed to identify and respond to new risks and emerging threats. We will need to provide comprehensive baseline data sets and quantifiable measures of biodiversity. Georgian Bay Forever has funded pilot studies into the application of some of these novel tools, such as DNA bar-coding.

GBF has also worked with coastal municipalities to establish common protocols for water quality testing, which townships around the bay can use to monitor the quality of water in their areas. We're building on this work by adding new diagnostic tools, such as microbial source tracking, to better understand the origins of contaminants and inform better management decisions.

We have completed an in-depth study of historical conditions using paleolimnology to establish baseline conditions against which to evaluate current water quality conditions to better understand changes. We have seen numerous bays that support or have experienced blue-green algae blooms in the past, leaving them more likely to degrade if conditions worsen.

GBF has financed research into coastal wetlands that have been referred to as the water treatment plants of the Great Lakes, but we have to recognize that in many areas, our current state of understanding is incomplete and drawing conclusions without proper data is not helpful in informing good policy.

For example, in the Honey Harbour area, where much of our research has been conducted over the past decade, some historical coastal wetlands have enlarged while others have disappeared. Understanding the net effects of these changes is required to predict the impacts on fish habitat and coastal water quality, yet some of this basic science data is missing, mostly on the Canadian side.

There are various ways to get this information, including remote sensing technologies such as light radar, but this requires the resources of the federal government, and not just for today but to inform Canadian decisions in the coming centuries. We echo suggestions made by some previous witnesses that we need to think of the Great Lakes as an entire integrated system and think holistically, across disciplines and across watersheds. Canada and the U.S. must collaborate on funding research, and remediation projects and models must allow for multi-year funding.

In summary, there is little argument that we need to prepare ourselves for changes in the system, but there is now a growing realization that adaptation in the face of dramatic changes may not be enough, and that mitigation of these expected impacts is required. Mitigation requires investing in resources immediately and with urgency to accumulate more robust data to better understand the system changes.

Again to quote Secretary Kerry, “There are those who say we can’t afford to act. But waiting is truly unaffordable.”

In the face of rapid-onset emerging threats, our institutional dexterity is usually surpassed. This leads us to encourage this committee to recommend, given that low water levels driven primarily by climate change are a threat to water quality and that the U.S. Department of State is now seized with the urgency of addressing climate change impacts following the release of the UN report, that Canada and the U.S. move forward with urgency to decide mitigation measures to address declining water levels in the Great Lakes, particularly Michigan and Huron.

Given that the Great Lakes should be treated as one holistic system, Canada needs to increase funding for Great Lakes restoration projects to levels that reflect its shared responsibility with the U.S. to protect the Great Lakes. Mechanisms must be enhanced to foster cross-border collaboration in solving Great Lakes issues such as algal blooms, invasive species, water levels, and water quality.

Robust funding for the implementation of the Great Lakes Water Quality Agreement protocol of 2012 must be provided. Support for the implementation of the Great Lakes water levels advisory board to improve our scientific understanding of the Great Lakes must be available. We recommend that a short-term program be implemented to monitor and eradicate Asian carp, and we call for the separation of the Great Lakes and Mississippi River in response to findings in the Great Lakes and Mississippi River Interbasin Study.

We recommend that the Great Lakes Executive Committee should report to this committee triennially on progress in Great Lakes protection and remediation, with this committee reporting to Parliament. Finally, the government must finalize the Canada-Ontario agreement.

In closing, we would draw the committee's attention to a study that we are funding on the impacts of declining water levels on the Great Lakes regional economy. It is being done by the Mowat Centre at the University of Toronto in partnership with the Council of the Great Lakes Region. This study is expected to show the very high costs of delays in implementing a solution to climate-driven declines in water levels and will support mitigation measures to address this problem. We would welcome the opportunity to return to discuss the results of this study with the committee.

● (1540)

Again, We would like to thank the committee for this opportunity to assist in your work.

The Chair: Thank you very much, Mr. Sweetnam.

We move now to Professor Jan Ciborowski of the University of Windsor.

Mr. Ciborowski.

Dr. Jan Ciborowski (Professor, University of Windsor, As an Individual): Thank you very much.

I'm very pleased to be invited to speak.

My name is Jan Ciborowski. I'm a professor in the department of biological sciences at the university. I've been there since 1984. I'm an aquatic ecologist interested in understanding the relationship between environmental stress and the biota that are affected by it. I've been working on the Great Lakes since the early 1990s.

Given the huge areas covered by the Great Lakes and the problems faced, I have worked hard to participate in and to help lead collaborative research among researchers on both sides of the basin and also to work with the government agencies on both sides to identify the problems and try to build collaborative work at a scale that can address these sorts of problems. I'm really pleased to be able to contribute my perspective on the questions raised by the committee.

I'll address each of the questions that were listed. The first question is: what are the areas of greatest environmental concern?

Really, there are two perspectives taken when identifying these areas of concern. One strategy involves protecting areas that are currently of the greatest natural and economic value, especially those at greatest risk of losing their value, which can be by loss of species or of the habitat that sustains them. As well, and in tandem with this, there is the loss of the economic value and the aesthetic value that sustain the people around the lakes themselves.

Such areas have been variously identified through initiatives of the conservation groups, including the Nature Conservancy of Canada, and in the U.S., the U.S. Nature Conservancy. The State of the Lakes Ecosystem Conference, SOLEC, developed the concept of biodiversity investment areas in 2000. These have guided many of the initiatives that have been trying to protect areas of shoreline throughout the Great Lakes as well. These are the areas most important in harbouring species of note, their important habitat, or the areas that are especially productive.

In Canada, the responsibility for protecting these areas is undertaken by both the provincial and national parks and special areas, as well as by the OMNR, and locally by the conservation authorities and municipalities. It is well recognized that we protect species and their environment by protecting and restoring their habitat. Nationally, this has been the responsibility of COSEWIC in identifying species at risk in their habitat, and federally of Fisheries and Oceans Canada through the fish habitat legislation.

The second strategy we have, in terms of understanding, is restoring areas that have been degraded to such an extent that their beneficial uses have been impaired. In the 1970s the International Joint Commission identified 14 different beneficial uses of the waters and the lands around the Great Lakes. When these uses become impaired, the areas are called “areas of concern”. They have been targeted for restoration by restoring those beneficial uses.

There are 42 areas of concern that have been identified, 12 in Canada entirely and five that are binational on various connecting channels on the Great Lakes. Of the 17 areas of concern associated with Canada, three have been delisted and two are in recovery. The remaining seven Canadian and five binational areas still have impairments, most relating to sediment contamination and habitat degradation.

The most widespread impairments, affecting all of the AOCs, are the degradation of fish and wildlife habitat and the degradation of the benthic invertebrates that sustain the fish. This degradation leads to restrictions on the dredging of the sediments to reclaim the area and on the consumption of fish. The other major beneficial use impairment is eutrophication, or the growth of undesirable algae. This is true both in the areas of concern on the Great Lakes and in protected areas, as Mr. Sweetnam has identified previously. The greatest areas in which this is recognized are on the shorelines and in the nearshore areas of the Great Lakes proper.

If we really want to restore these areas, we have to understand not just where those stresses occur but also the stress-response relationships. We have to be able to reduce the stress to the extent that those beneficial uses are restored. Understanding the stress is key to understanding the processes, not just the condition. What we have to recognize is that it is the extremes that are important, not just the average conditions. We lose species and lose environment at the worst times, not at just the average times. This means that we have to have monitoring on a continuous basis rather than just of the average.

From a geographical perspective, we're increasingly understanding that in order to control the stress we must look to the inputs to the lakes, not just to the lakes themselves. Although nutrients and toxins were formerly delivered by the atmosphere and by point source pollution—sewage treatment plants and industrial effluents through pipes—more and more we recognize that it's the runoff from farmland and from the suburban and rural areas, which are non-point, that is causing our greatest problems, especially during times of extreme weather conditions.

● (1545)

Runoff from farmland and so on is the primary source of nutrients, especially phosphorous, whereas formerly it was due to materials bound to sediment particles. Increasingly it's dissolved phosphorous that is the cause because this is much more bioavailable to algae, leading to the increase in hazardous algal blooms and nuisance algae on shorelines. It's also due to hypoxia, the absence of oxygen in the deeper parts of the lake when these materials decompose.

If we're dealing with shoreline that is rocky or sandy, the result is nuisance algae, things like cladophora that cause unsightly messes on beaches and shorelines, and when they decompose, they lead to epidemics like botulism and massive bird and fish kills. If the shorelines are muddy or silty, those nutrients tend to run into the middle of the lake where they give rise to hazardous algal blooms through cyanobacteria as well.

In practice, areas of environmental concern represent a continuum. It's not just the best areas and the worst areas; what we see is a full range of degradation. A lot of my collaborations and those of others have dealt with trying to understand and quantify the amount of human activity by type, amount of agriculture, amount of development, population density, and road sources in the various tributaries that are leading to the discharge into the basin.

There are over 5,900 different watersheds and contributing watersheds around the lakes, and we've been able to quantify the amount of development, the amount of stress, which allows us to determine where those stresses are the greatest, where they are the minimal, and where the greatest risks are.

We've been able to take advantage of new technology—remote sensing, and so on—that lets us produce maps for the state of the environment conference, the SOLEC, as well as recently for maps of both the lake and the land through the Great Lakes environmental assessment and mapping program. These are based on anywhere from 34 to 210 different types of stressors. By knowing where they occur, we can identify the best and the worst, where the transitions are that lead to the degradation and loss of the biota that really reflect what we're most interested in. This has allowed us to prioritize areas that are most at risk of biological degradation as well as the areas that are most likely to be able to be restored and as well to identify areas of risk to Great Lakes health.

Historically, we've identified the Detroit River and the Maumee River as areas of greatest risk, but looking at the more recent maps, we've come to recognize, using both the maps and also new genetic techniques, that places like the Thames River and the Sydenham have been providing elevated levels of nutrients that are giving rise to hazardous algal blooms both in Lake St. Clair on the north shore of Lake Erie and other areas that are synonymous with the types of things we've been seeing coming from the Maumee.

Other contemporary threats of ecological and economic use include the effects—

● (1550)

The Chair: Excuse me. I'm just going to interrupt you for a minute. We have a 10-minute window. You're at eight minutes. You have a number of pages. I don't know if you want to prioritize some of the other pages. I hate to interrupt, but I'll give you that extra time though.

Dr. Jan Ciborowski: Thank you.

Shoreline development, episodically low water levels, as Mr. Sweetnam has described, and most especially the threats of invasive species are the really major threats. The prospect of Asian carp entering the Great Lakes through the Chicago channel and elsewhere is perhaps the most serious threat of causing changes in the entire food web. If we were to prioritize, that would be at the top.

We have a new annex to the Great Lakes Water Quality Agreement that has identified 12 different areas of concern or areas of remediation. There have been binational task forces formed that are addressing these according to very strict timelines, and I'm very confident that these will help prioritize and lead to strategies.

There are many efforts under way to speed restoration. In the U.S., we have the Great Lakes restoration initiative that's seen the investment of several hundreds of millions of dollars to deal with the greatest areas. Expenditures in Canada have been more modest but are still directed to specific risks. The Great Lakes nutrient initiative, which we hope will be matched by the province, is expected to have great effects.

The greatest threat I see, though, over the last five years has been a real lack in planning to assess the effectiveness of all this remediation. We've seen huge investment in repairs and trying to deal with things. What we seem to have lost at the same time, though, is the ability to communicate binationally. As Mr. Sweetnam mentioned, these efforts are binational. They work at much greater scales. What we've lost is the ability to travel, the ability to interact, and this is going to be absolutely essential.

If we're going to understand the effectiveness of these things, we have to know what things were like before, what they're like after, and what the basin-wide loads and restorations are. It's absolutely essential that we realize that the lakes and biota don't recognize political boundaries and that the processes are organized by the flow of materials from the watersheds and mixed into the lakes.

Consequently we need coordination and discussion among these different levels of government. Fiscal constraint and travel and communication restrictions have been very significant impediments to understanding how effective the initiatives are. I would really argue that the realignment of personnel and reorganization of departments, as well as these restrictions, have really led to impediments.

I'm very confident that with the new Great Lakes Water Quality Agreement, the assessment, and commitment to these task groups will lead to a re-establishment of those communications, and I really look forward to a reappearance of that lost dialogue.

The Chair: Thank you very, Mr. Ciborowski.

We move now to Mr. James Brennan with Ducks Unlimited.

Mr. Brennan.

Mr. James Brennan (Director, Government Affairs, Ducks Unlimited Canada): Thank you, Mr. Chairman.

Good afternoon, ladies and gentlemen. Ducks Unlimited Canada is grateful for the opportunity to appear before this committee on this important issue. My name is Jim Brennan. I'm the director of government affairs based here in Ottawa and my colleague, Dr. Mark Gloutney, also based here in Ottawa, joins me here today. Mark is director of regional operations for eastern Canada.

Ducks Unlimited Canada maintains a very keen interest in water quantity and water quality in the Great Lakes Basin, primarily because of the high importance of this area for waterfowl and Ducks' mission. In fact, the Great Lakes-St. Lawrence valley ecozone is widely recognized in the waterfowl conservation community as being continentally significant, with the coastal wetland habitats of the lower lakes supporting millions of migrating ducks, geese, and swans, and the supporting inland wetlands being the nursery to many of the birds that migrate up and down the Mississippi and Atlantic flyways. Today we'll categorize water quality issues into two broad categories: sediment-based issues and water-based issues.

Sediment-based issues refer to those issues that concern suspended particulates in the water, including those materials accumulated along the beds and banks of water bodies via erosion, among other reasons. Most often, elevated levels of sediment results in issues like turbidity or contaminant buildup. These issues tend to be localized and well-known, and have formed the basis for ongoing remediation strategies over a number of decades.

On the other hand, water-based issues typically generate lake-wide and sometimes even basin-wide effects. As you are no doubt aware, these can have very serious social, economic, and ecological impacts. Water-based issues are largely the result of activities within the broader watershed, both activities undertaken in and around water as well as activities undertaken in adjacent upland areas. Phosphorus loading is an example of one issue that arises from broader land use practices in a watershed and that has far-reaching water quality effects.

While the negative effects of sediment buildup and runoff in the Great Lakes are significant, our core area of expertise is in wetlands and water. As such the balance of our comments will focus on water-based issues. On this matter we are pleased to report that we bring some good news. Wetland conservation and restoration form a practical and highly effective part of the solution to improve Great Lakes water quality.

At this time I'd like now to hand over the balance of our presentation to Dr. Gloutney.

● (1555)

Mr. Mark Gloutney (Director, Regional Operations, Eastern Region, Ducks Unlimited Canada): Thanks, Jim.

[*Translation*]

Wetlands are nature's water treatment plants. Abundant, intact wetlands remove phosphorous and provide important services that reduce the amount—

[*English*]

The Chair: Just a moment. I'm not getting translation, but I'm not sure if anyone else is.

Sorry, start again. We'll give you that extra time.

[*Translation*]

Mr. Mark Gloutney: Wetlands are nature's water treatment plants. Abundant, intact wetlands remove phosphorous and provide important services that reduce the amount of other impurities that enter our streams, rivers and ultimately the Great Lakes.

Ducks Unlimited Canada recently completed a research project to evaluate the impacts of wetland loss in the Lake Simcoe Watershed. This watershed, as many of you will know, is situated in the heart of one of the most highly developed rural landscapes in Canada, one hour north of Toronto, and is roughly 744 km^2 in surface area.

[*English*]

Our science clearly indicates that wetlands are critical to solving Lake Simcoe's water quality problems. For example, the results were very sobering for us. It provides that if all of the remaining wetlands on one small tributary, the Black River subwatershed near Sutton, were lost, the impacts would include: an 891% increase in phosphorus loading—this is equivalent to dumping 47 tonnes or 22,000 bags of lawn fertilizer into the river every year—a 13% decrease in groundwater recharge capabilities, which have direct linkages to water quality; a 251% increase in sediment loading, also impacting water quality; and a 260% increase in nitrogen loading, which will impact public use, swimming, and recreation.

The research also revealed that Black River wetlands' removal of phosphorus saves the local municipalities about $300,000 per year. Further wetland loss would significantly affect the benefits of the financial investments in local water treatment facilities in the Lake Simcoe watershed. Losing approximately 25% or 2,088 hectares of the remaining wetlands would negate the current amount of phosphorus removal services of the Sutton Water Pollution Control Plant. Losing another 52 hectares of wetland would negate the additional removal capacity of the recent $3.8 million upgrade to the Sutton plant.

[*Translation*]

Additional economic research revealed that wetlands in the Lake Simcoe basin are estimated to be worth $11,172 per hectare annually or $435 million per year.

The most valued services these wetlands provide are water regulation, water filtration, flood control, waste treatment, recreation, and wildlife habitat, followed by climate regulation.

In the end, the science clearly demonstrates that investments in green infrastructure, like wetlands, are critical to retaining and enhancing grey infrastructure investments. While the information we have presented here relates specifically to Lake Simcoe, this study can be extrapolated throughout the broader Great Lakes Basin and we would expect the same results.

As such, there is considerable reason to be deeply concerned when we consider the current wetland loss trends in Ontario.

[*English*]

In spite of the significant values that wetlands provide, wetland losses within the Great Lakes watershed have been and continue to be substantial. For example, in southern Ontario we've lost 72% of wetlands, corresponding to 1.4 million hectares. This corresponds to the size of three-quarters of Lake Ontario. The loss continues with an additional 70,854 hectares of wetlands lost larger than 10 hectares, between 1982 and 2002. In the Lake Erie watershed, more than 85% of wetlands have been lost. Losses of Great Lakes coastal wetlands have also been substantial and in the same order of magnitude. Losses on the U.S. side of the Great Lakes have been comparable, averaging 65%.

Take a moment to imagine scaling our Black Creek findings up to the entire Great Lakes Basin, which is approximately 245,000 square kilometres when combined. Imagine what disastrous effects will result if we continue to lose more wetlands within the Great Lakes watershed. On the other hand, we would ask you to please take a moment to imagine an alternative picture, one where we work together to ensure that existing wetlands remain intact and functional and make a strong effort to restore wetlands in areas where they have been lost or degraded.

To Ducks Unlimited Canada, this picture looks like millions of dollars saved in foregone capital expenditures on environmental relief and rehabilitation; sustainable, renewable industries that rely on the health and integrity of the Great Lakes Basin; a healthy tourism and agricultural sector; healthy populations; and extensive social and ecological co-benefits, like habitat for fish and wildlife and upcoming generations of Canadians who connect with and to nature.

So how do we do this?

We are making some grounds programmatically and in recognizing the roles that wetlands play as a viable part of the solution. For example, the recent Great Lakes Water Quality Agreement explicitly includes wetlands as a key important habitat. Long-standing partnerships like the North American Waterfowl Management Plan persist and continue to invest in habitats on the ground. In Ontario alone, this partnership has resulted in the conservation of seven million hectares with an investment of $193 million.

Environment Canada's natural areas conservation program is a federal securement tool that has been used by conservation partners like Ducks Unlimited to purchase and permanently protect critical wetland habitats, including vital Great Lakes coastal wetlands, an important inland wetland complex.

While these programs and initiatives are excellent and must continue, we insist that more needs to be done. Moving forward, Ducks Unlimited proposes that we must work together, first, to ensure that the values of wetlands and their link to water quality is clear to all Canadians. We must ensure that expanded measures exist to conserve and restore wetlands throughout the Great Lakes watershed. As we have indicated to this committee previously, wetland conservation should be a cornerstone to the Government of Canada's national conservation plan.

Second, we must ensure that long-term funding is available for wetland conservation. Ducks Unlimited Canada calls upon the Government of Canada to increase its financial support for wetland conservation through a new national wetlands conservation fund. Ducks Unlimited Canada stands poised and ready to match this funding commitment.

Third, we must work with other levels of government to ensure that planning is landscape scaled, science based, well coordinated, and that appropriate policies exist to support our wetland conservation objectives.

Fourth, we must engage with our partners on the working landscape and build programs that compel people to make choices that benefit wetlands, and in turn, water quality.

● (1600)

The Chair: Thank you, Mr. Gloutney. We'll leave the summary for later.

We'll now move to Ms. Mary Muter.

Ms. Mary Muter (Vice Chair, Restore Our Water International, Sierra Club of Canada): Good afternoon, honourable members of the Standing Committee on Environment and Sustainable Development. Thank you for taking the time today to look into the issues facing the Great Lakes. I know you've had previous speakers here, so we appreciate that.

By way of background, I will tell you that I am a full-time volunteer and have been working on Great Lakes water quality, water quantity, and wetlands for over 25 years. My background is in public health, so that when I first volunteered to sample recreational waters in Georgian Bay for bacteria such as E. coli and fecal streptococci, I carried out that work long before the tragedy of Walkerton happened. I knew then what high levels of these bacteria in the water meant, especially for young children learning to swim. The lesson I learned from that experience is that Environment Canada needs to strengthen the bacteria standards for safe recreational use of fresh water.

Today I wish to follow on the comments made last week by Dr. Pat Chow-Fraser of McMaster University. We have been working with Dr. Chow-Fraser for over 10 years now. Her work with us to identify and assess the wetlands on the east and north shores of Georgian Bay is groundbreaking, as no government agency had previously carried out that work.

● (1605)

At binational meetings around the Great Lakes that I attended, I would often see mapping not showing the extensive wetlands on Georgian Bay. The Great Lakes community, including government agencies, now knows that the most extensive, highest quality, most diverse but also sensitive wetlands in all of the Great Lakes are found in Georgian Bay.

As you know, wetlands provide important fish and wildlife habitat, but also play an important role in removing nutrients and chemicals found in the water. As the previous speaker noted, 70% of wetland habitat has been lost from Lake Ontario and Lake Erie, so there is an elevated need to protect what good wetland habitat we have left in the Great Lakes.

On Georgian Bay, after 14 years of sustained low water levels, Dr. Chow-Fraser has found we have lost an average of 24% of wetland fish habitat. There is a close link to degradation of water quality in a now shallow base that, because of the sustained low water levels, has lost the necessary exchange of water with open Georgian Bay water.

Over the past three summers, in the south shores of the bay, including Wasaga Beach Provincial Park, there have been significant die-offs, with dead waterfowl and fish washing up on the beaches. The cause is not certain but appears to be related to the low water levels, concentrating nutrients in shallow or warmer waters, resulting in algal blooms allowing for the growth of bacteria.

For some reason, the endangered, like sturgeon, have been targeted with dead three- to five-foot fish washing up on the shores. These die-offs would hit front-page news if this was happening on Lake Ontario shorelines, but because we are removed from easy reporting distance, it simply does not get covered.

This summer we will be setting up a citizen's botulism watch program and we'll have folks collect freshly dead birds and fish. We will freeze them and then send them to a lab at the new university in Oshawa that has a secure lab to test for botulism, so we can finally determine the cause of this.

Today, I do not have time to go into all of the Great Lakes issues there are, so I will focus on Asian carp and water levels.

I am sure you are all aware of the significant threat posed by the very large invasive carp species that are at the doorstep to the Great Lakes at Chicago. The silver carp feed by filtering out the tiny organisms that are at the bottom of the food chain for our native fish thereby disrupting the food chain. They can eat up to the equivalent of their weight in food daily, and grow up to over 100 pounds and four to five feet in length.

They spawn three times a year and adults can lay up to a million eggs each time. We have nothing like that right now in the Great Lakes. Other invasive carp species feed on wetland plants and tear the plants apart in doing so. These very invasive fish have the potential to decimate the $8 billion plus recreational Great Lakes fishery.

Early in January of this year, the U.S. Army Corps of Engineers released its report on options to prevent these fish from getting into the Great Lakes. The public comment period ended yesterday, but let me highlight two of our concerns.

First, the report made no mention of the risk these fish pose to Canadian waters. Our Department of Fisheries and Oceans completed an excellent risk assessment in 2005 that showed all four species now present in the Mississippi River posed a high risk to infiltrate into Canadian waters. The silver carp is the most aggressive. DFO determined that it would take over our lakes and rivers all the way up to James Bay and west to Alberta. But in 2009 a joint risk assessment was carried out by DFO with the U.S. Army Corps of Engineers. That risk assessment showed that once in Lake Michigan, the silver carp would infiltrate all of Lake Huron, Georgian Bay, and Lake Erie within five years.

This is an unacceptable risk and Canada needs to let American authorities know more clearly that under the Great Lakes Water Quality Agreement the U.S. has obligations to prevent these fish from getting into the Great Lakes. The cost of prevention is much less than the millions we spend annually just to keep the numbers of one invasive species down, the sea lamprey. Scientists now know we will never be able to eradicate just this one invasive.

Second, the army corps listed eight options for preventing Asian carp from getting into Lake Michigan. The fish are now 60 miles away from entering the Great Lakes at Chicago. The army corps have listed the status quo, the electric barriers, as an option. Last summer the corps revealed that video footage taken at the electric barriers showed schools of four-inch fish swimming right through the barriers. In other words, the barriers should not be listed as an option. The only responsible option is total separation of connections between Lake Michigan and the Mississippi River.

● (1610)

Let me now turn back to water levels. We have an opportunity here to correct a 50-year-old failure to act. In the 1950s and early 1960s the last formal deepening dredging took place in the navigation channels in the Great Lakes. A Canada-U.S. agreement was signed at that time that said that a condition of the dredging to deepen the channels to 27 feet was that the U.S. army corps would install compensation measures in the upper St. Clair River.

St. Clair River connects Lake Huron down through Lake St. Clair and the Detroit River to Lake Erie. But Environment Canada could not agree with the U.S. army corps on how many submerged sills or speed bumps should be placed on the riverbed. The project was being funded entirely by the Americans, but after 10 years the U.S. Congress withdrew the funding but not the authorization. Our governments agreed that there was a permanent lowering of Lake Michigan, Lake Huron, and Georgian Bay as a result of the deepened channel, but they thought it was a one-time drop and no further lowering would take place.

However, when water levels plummeted four feet beginning in 1999, we began working with a team of engineers as we suspected something had happened in the St. Clair River that contributed to the sudden drop that went beyond the decline related to decreased precipitation. Now 15 years later, erosion in the upper St. Clair River has been confirmed by the International Joint Commission as a contributing factor to the low water levels. The IJC has now advised our governments—almost a year ago—that Lake Michigan, Lake Huron, and Georgian Bay levels be restored via flexible measures in the St. Clair River.

After over 100 years of human alterations, including dredging, Lake Michigan, Lake Huron, and Georgian Bay have been lowered by 50 centimetres, or 20 inches. This has not happened to any of the other Great Lakes. They have control boards and the ability to maintain their lake levels. This is an uncompensated loss. As a result, today there is a significant imbalance of water levels in the Great Lakes. Lake Superior, Lake Erie, and Lake Ontario are all at or above their long-term average; but Lake Michigan, Lake Huron, and Georgian Bay are 34 centimetres, or 13 inches below their long-term average.

The U.S. government has now gone ahead and provided some funding to the U.S. army corps to begin their general re-evaluation report of the St. Clair River compensation design. In Canada, I have been assured that three senior cabinet ministers plus several MPs are seeking a coordinated Government of Canada response. We await that response. Canada, unfortunately, does not have any government agency like the U.S. Army Corps of Engineers that is capable of undertaking a project like this. We need to be at the table and announcing support for the IJC's advice and some funding so that we can then become a partner to resolving this.

This past winter's cold and snow across the Great Lakes has brought some temporary raising of all water levels, but the imbalance remains. In addition, virtually all of the experts are advising us that this truly is just a blip in the weather, not a change in the climate. The Great Lakes water is only 1% renewable; 99% is a glacial-age deposit. The time to act is now to restore the balance of water levels in the Great Lakes by compensating for the human-induced loss of water from Lake Michigan, Lake Huron, and Georgian Bay down the deepened St. Clair River.

I have some graphs to illustrate my point, and I think you should have a copy of this graph showing the increased conveyance over the past 100 years through the St. Clair River. This is basically the capacity of the channel.

The Chair: The committee members don't have a copy because it wasn't in both official languages. I happen to have a copy, but the other members don't.

Ms. Mary Muter: Oh, okay.

The Chair: Ms. Muter, your time is up. You can maybe refer to that during some of the questions that come your way.

We're going to move to our questions. I just want to clarify—

Sorry, go ahead.

Mr. Stephen Woodworth (Kitchener Centre, CPC): There are two items before us that we haven't had access to that might be useful to us. One is the chart that Ms. Muter just mentioned and the other would be the full text of Professor Ciborowski's comments—and I was rather intrigued by them. So I wondered if it would be in order to request that those items be in some fashion provided to the clerk and translated for distribution to the members. I would appreciate it, at least.

The Chair: We will. I'm sorry, I wasn't aware that Mr. Ciborowski's comments weren't available in both languages. I had them here.

Okay, we're going to move to the rounds of questions. I will just remind committee members we will probably need to discontinue at 5:15 because of the bells that are projected for the votes that are coming up. We will move now to the opening round of seven minutes.

Mr. Carrie, please.

● (1615)

Mr. Colin Carrie (Oshawa, CPC): Thank you very much, Mr. Chair.

I want to thank the witnesses for being here today. I have so many questions, so I'd like to start off right away with Ducks Unlimited.

My understanding is that our government is currently providing almost another $370,000 towards your Lake Simcoe-southeastern Georgian Bay wetland collaborative through the Lake Simcoe-southeastern Georgian Bay cleanup fund. I was wondering, could you elaborate a little bit on that program?

The Chair: Mr. Gloutney.

Mr. Mark Gloutney: That's a project we're working on to increase the overall awareness of wetlands and wetland conservation issues in the geographic area that the fund is targeted to, which is sort of Georgian Bay and Lake Simcoe.

We have a number of different elements within it. Some of them are directly related to some restoration activities on wetlands. There is another element that looks at mapping, to provide details for planners on the wetlands that actually exist within that landscape. Another key element is outreach. We're taking the information that we have and providing it to land planners and partners on the landscape, so that they can begin to understand and incorporate wetlands conservation into their official planning processes and in their overall municipal planning.

Mr. Colin Carrie: That's great.

I think it's really important that people understand the importance of wetlands, so I was wondering if you could comment on how wetlands help restore and sustain Great Lakes water quality and ecosystem health.

Mr. Mark Gloutney: That's a broad question.

Mr. Colin Carrie: It is, yes.

Mr. Mark Gloutney: I think there are a number of primary ways in which they do that. First and foremost is in terms of removing nutrients and sediments and preventing those elements from entering into the lake and causing the disruption of the lake ecosystem; that's the primary one.

In terms of the value of the wetlands, they are critical habitats. They are important to waterfowl, which is why Ducks Unlimited is interested in them, but also to a multitude of other species that are critically important, things like the fish that live in the Great Lakes and Great Lakes Basin and that are important to people. They are one of the highest densities of species at risk that occur within our wetlands along the Great Lakes.

I think the other key value that they provide as well is mitigation of flooding by providing storage and intercepting water as it's moving through the systems.

Also, I talked in my presentation about some of the economic consequences of having those wetlands in place and the functions that they provide.

Mr. Colin Carrie: I was a little concerned when you mentioned that 72% of southern Ontario's large inland wetlands have been lost or converted to other land uses over the last 200 years and that the loss continues.

You also mentioned the ability to reclaim. Do you have any rates at which reclamation is occurring? How is it going now?

Mr. Mark Gloutney: Our assessment is that we're continuing to lose the battle and that the wetlands are disappearing off the landscape faster than we can put them back on the landscape.

We're restoring several thousands of acres of wetlands every year in Ducks Unlimited activities. There are a number of other people who work on the landscape doing conservation work. Conservation authorities are doing some reclamation activities, but again, probably on a smaller scale overall than Ducks Unlimited. Some of our other conservation partners are doing a little bit, but I think you could probably say that if there were 3,500 acres of restoration happening across southern Ontario, that would be pretty close.

Mr. Colin Carrie: Earlier we heard from different witnesses who talked about different government policies that we might be able to implement. There are some at the municipal level, the provincial level, and the federal level. I was wondering if you have some ideas about things that can be done.

Mr. James Brennan: Can you clarify for me just exactly what you mean? Are you speaking of specific policies?

Mr. Colin Carrie: Yes.

Mr. James Brennan: Well, certainly Ducks Unlimited has been active in suggesting to all levels of government that fairly broad sweeping wetland protection measures be put in place across the country. There are some policies that are in effect, and there are particularly effective policies in Atlantic Canada, where certainly the bulk of the wetlands are protected and there are mitigation sequences in place that strive to find solutions to replicating or restoring wetlands that have been unavoidably lost.

Certainly, Ontario does not have a similar type of policy in place. There are measures in place through the provincial Planning Act, which is where the wetland policy for Ontario resides, but certainly we would like to see the types of policies that exist in the Maritimes replicated across Canada.

● (1620)

Mr. Mark Gloutney: Could I add a little thing to that?

Mr. Colin Carrie: Oh, sure.

Mr. Mark Gloutney: I think the key element is creating some certainty around it. We talked about wetland protection policies, and the key element, as Jim mentioned, is the mitigation sequence, where you're trying to avoid, minimize, and then compensate for any loss. I think if we can embed those kinds of elements into any policy, it enables government to meet their mandates, but it also provides certainty to development.

So it's a benefit for development and industry, because they now have some certainty as they move forward. What we hear when we work with industry is that what kills them most is the uncertainty around environmental regulation.

The Chair: Mr. Carrie, you have 10 seconds left. We'll maybe add that on to someone else's time later on.

Mr. Bevington, you have seven minutes, please.

Mr. Dennis Bevington (Western Arctic, NDP): Thanks, Mr. Chair.

Thank you to the witnesses. I think you've painted a pretty difficult picture of the conditions in the Great Lakes and certain areas that are quite under stress.

Mr. Ciborowski, I'm interested in the chemicals in the water system. You talked about polycyclic aromatic hydrocarbons, environmental estrogens. What are the main causes of those things coming into the—

Dr. Jan Ciborowski: I didn't refer to them specifically. The environmental estrogens can be byproducts of things like PCBs, but they also come in through personal care products. They've been documented to have influences at the site where sewage treatment plants may release their materials, but there's so much dilution by the water itself that those effects have not been seen at larger scales.

Things like polyaromatic hydrocarbons and other hydrophobic chemicals that don't mix with the water and tend to stay in the sediments are legacy industrial byproducts that have been around for many years. They're still there in the sediments, and when the sediments are dredged to clean them, or perhaps washed away by water levels and so on, that's when they can become reintroduced into the water system and can have their effects there.

Mr. Dennis Bevington: Are you familiar with TFA? It's a perf....

Dr. Jan Ciborowski: Perfluoric?

Mr. Dennis Bevington: Perfluoric acid.

Dr. Jan Ciborowski: I'm not that familiar with it.

Mr. Dennis Bevington: So it hasn't been tested for in the water system in the Great Lakes?

Dr. Jan Ciborowski: I'm not familiar with that.

Mr. Dennis Bevington: Okay. Well, that's interesting, but I'll leave that.

Mr. Sweetnam, we've had a great debate here over the days about the relationship between water quality and water quantity. It's something that I want to clarify, and I think perhaps you, speaking about Georgian Bay, can really lay this out—why water quality and water quantity are synonymous subjects.

Mr. David Sweetnam: I think it also does depend on geographic location. The eastern coastline of Georgian Bay is an archipelago, with lots of coastal embayments. Some of the embayments are more connected to the bay and others are less connected to the bay. When water levels drop, you can have significant percentages of that connection. The pipe between the water that could dilute any of the coastal nutrients that come into it is reduced markedly.

For example, in Sturgeon Bay, with water levels being much lower, in the slide deck you can see that the internal loading of phosphorous in that bay doesn't have the ability to be diluted enough to kind of wash through the system. At that point, the concentrations increase and the right conditions consist for a blue-green algae blooms, which then degrade the use of the water.

There are two other bays that are listed here, north bay and south bay, that are very close to one another but quite different in their actual bathymetry, the structure of the basins. What we found was that the conditions that exist in Sturgeon Bay for blue-green algae blooms actually exist in those bays. Historically, given our ability to go back in time and look at different types of plant communities and predict the impacts of higher or lower water levels that existed there, we've actually seen blue-green algae blooms in those bays, again related to water level impacts. We can't pinpoint exactly how many years of duration they've had, but we've seen blue-green algae blooms there too.

● (1625)

Mr. Dennis Bevington: There's another question I've asked some of the witnesses here. The elephant in the room is the agricultural industry. Do you think in the future it will be necessary to regulate what people are doing on farmlands in order to control this nutrient release into the Great Lakes if we really want to make a difference with it?

That's for anyone.

Dr. Jan Ciborowski: I'll be happy to respond to that.

That's receiving an incredible amount of attention, especially in Ohio where the Maumee's been charged with a lot of the hazardous algal blooms. There's intense interest by the farm community to undertake voluntary best management practices to avoid being regulated. The key issues seem to be the timing and the intensity of nutrient discharge. Certainly, there are best management practices that can be implemented to try to reduce the runoff of those nutrients from the farmland. It deals with the types of fertilizers that are used, the way they're applied, whether they're on the surface or whether they're injected into the materials. I think that's an area of active exploration, and it's certainly something that will have to be dealt with by the farm community, either voluntarily or through regulation.

Ms. Mary Muter: Yes, I would add to that. There are better farming practices that need to be encouraged by working with the farming community. I was at a binational meeting where the operator of a very large farm on the south side of Lake Erie described how he was leaving what was left of his crop after he took the corn off the field. He then mulched all that material and left it on the field, and over a period of years developed a mulch that retained water and the nutrients in the soil, and prevented runoff.

The other thing that's happening is rules to prevent discharge of manure or raw sewage onto farmlands during the winter when the ground is frozen, because that simply allows those nutrients to run right off into adjacent waterways. Regulation and preventing that from being allowed is absolutely necessary.

Mr. David Sweetnam: I think one other thing to keep an eye on also is open-cage aquaculture and the amount of phosphorus that can be released as those operations become more popular or intensified versus closed systems where the effluent of those operations would have to be treated like other industrial operations. That's something to keep an eye on.

The 46-tonne figure that was used for the amount of phosphorus getting dumped in is the current estimate that one of the groups up at Georgian Bay is looking at for the load of the existing aquaculture operations too, so it's pretty significant.

The Chair: Thank you.

We'll move now to Mr. Sopuck for seven minutes.

Mr. Robert Sopuck (Dauphin—Swan River—Marquette, CPC): Thank you.

Dr. Ciborowski, I see from your bio that your specialty is benthic invertebrates. Can you discuss the succession of the benthic invertebrate community in a lake, and use Lake Erie as an example, from the pristine condition to what it is now, based on the input of phosphorus? How does it change?

Dr. Jan Ciborowski: It depends on what part of the lake you're looking at, because we have a shallow western base—

Mr. Robert Sopuck: Take the worst part.

Dr. Jan Ciborowski: Okay. The western basin is a case in point, which is perhaps the best study of the Great Lakes because it's been subject to pollution for the longest time. When conditions are good, the water mixes, there's enough oxygen there, and the mayflies come out as fish flies and do very well. They require oxygen at the bottom of the lake because they burrow into the sediments. If you have periods of calm, or you have elevated nutrients and the algae drop to the bottom, the oxygen levels drop to zero, the mayflies die, and the animals that are able to take their place are bloodworms or oligochaetes, and they're indicative of polluted conditions.

Western Lake Erie is constantly being turned over, so that's one of the examples of an extreme. You might have lots of oxygen for most of the year, but all you need is five days of zero oxygen to wipe out that population, wipe out the food base for the fish.

● (1630)

Mr. Robert Sopuck: Are the mayflies completely gone from Lake Erie?

Dr. Jan Ciborowski: They recovered in 1992. That's what got me my start there. There wasn't supposed to be any there, and they had recovered very well. They're missing from the eastern part near Leamington. That's the one part of the lake where they haven't returned. But the populations are doing better and worse from year to year, and we're still trying to find out why that cyclic loss is going on. They seem to be recovering, but they're not restored. The pattern of the mayflies there now, when we say they're there, is the complete reverse to what it was before the 1950s when we first lost them permanently.

Mr. Robert Sopuck: Okay.

To the representatives from Ducks Unlimited, where are the wetlands being lost, and exactly why are they being lost? What's happening on the land out there?

Mr. Mark Gloutney: We think that loss is happening from a multitude of different sources. Urban expansion, urban development, and industrial expansion are eating into the wetlands and having an impact there. There is some ongoing loss on the agricultural landscape, so those are the main drivers of change of wetlands. If you looked historically you would have said it was all agriculture. I think it's shifted now, where the main drivers are expansion.

Mr. Robert Sopuck: Again to the Ducks Unlimited folks, the concept of habitat banking is getting a lot of interest whereby wetland loss in one area is mitigated in another area, and sometimes it's two to one. I think that has the possibility to unleash a lot of money from the industrial community to perhaps flow into the agricultural community to restore and recreate wetlands.

Would you think that changing federal policy to strongly encourage habitat banking and off-site mitigation would be a good idea?

Mr. James Brennan: Yes, we have certainly said that before this committee in the past, and again we would think that would certainly be a viable approach.

Mr. Robert Sopuck: Okay.

In terms of the best management practices, Ms. Muter, I think you talked about voluntary best management practices being what the agricultural community prefers. But the issue on the agricultural landscape, in terms of activities there, is actually one of scale, isn't it? We know what to do, but what's being done is being done on such a small scale it's really not making much of a difference.

Is that a fair characterization?

Ms. Mary Muter: I think it is a fair characterization and I think there are communities, for instance around Lake Simcoe, where they have started to work with the farmers, and they're a unique group. You need to bring them on board. You can't just impose regulations on them if they're not going to be happy with them, so it's much better to work with them.

I know that a farmer down in Ohio formed some kind of a group and he started to encourage other farmers to carry out the same types of practices. So it can spread and I think that's the best way to make it happen.

Mr. Robert Sopuck: Would you support a program or an initiative if government were to propose it, of actually setting up a large-scale ecological goods and services program across Canada where farmers are paid out of the agricultural envelope to deliver environmental services to the public at large?

Ms. Mary Muter: I think that's a great idea because I know this farmer who started this down in Ohio said that it cost him a lot of money to switch over to get different types of equipment. He had to basically give up using the type of equipment he had been using.

It took him several years before his crops matched what they were before. He had stopped using fertilizers and pesticides and herbicides, and simply by changing his farming method he was able to save money on those expenses, but the conversion cost money. So there was an incentive, yes.

● (1635)

Mr. Robert Sopuck: Because both the Americans and the Europeans have very large-scale environmental incentive programs and Canada seems to be the only country that doesn't do it. I personally am an avid proponent of this particular approach because I firmly believe that the issue is one of scale. It's not an issue that we don't know what to do.

In terms of the best management practices, I don't know who to direct this question to. But in terms of the reduction of phosphorous going into the Great Lakes, do we have quantitative information on the effects of certain best management practices on reducing phosphorous input into waterways and then into the Great Lakes?

Dr. Jan Ciborowski: One of the problems we have is that we have surprisingly little information. This is a point I wasn't able to make, but despite all the efforts, all the attempts, the funding for doing the basic research, as Mr. Sweetnam said, just doesn't seem to be there. If you have only so many dollars, you put it into restoration and not into finding out whether it works or not. That's one of our real limitations, that we don't have the appropriate evidence of how much and how effective it is.

The Chair: Thank you, Mr. Sopuck.

We're going to have to move now to Mr. McKay for seven minutes.

Hon. John McKay (Scarborough—Guildwood, Lib.): Thank you, Chair.

I want to start with Ms. Muter's last comment about Lake Superior being 99% glacial and 1% surface. I'm not quite sure I understand that comment.

Ms. Mary Muter: It's all of the Great Lakes—99% is left from the retreat of the ice age, so it's a glacial deposit. One per cent is a renewable resource that's renewed by rainfall and snowfall precipitation.

Hon. John McKay: Of all of the water in the Great Lakes, 1% is renewable—

Ms. Mary Muter: That's correct.

Hon. John McKay: —and the rest is historical.

Ms. Mary Muter: That's correct.

Hon. John McKay: Really? You learn something every day.

Ms. Mary Muter: Right, and if you think about the water being lost down the St. Clair River, that is glacial deposit that's being lost down the St. Clair River due to the increased outflow.

Hon. John McKay: So we're not going to catch any big break from this horrible winter and this pile up of great snow and ice.

Ms. Mary Muter: We are going to catch some, but no, we need to start to manage the Great Lakes much more responsibly than we are now. Canada doesn't even have a flow meter at a critical part in the St. Clair River, so we don't even really know what's happening there.

Hon. John McKay: This brings me to the second question. I would like to get both Mr. Sweetnam's and your comments on this. Basically, you said that Superior, Erie, and Ontario are at historically normal levels, but Michigan, Huron—Georgian Bay—are at historically low levels. I interpreted that to mean that there is no way, in that configuration, to restrict the flow out through Lake St. Clair—

Ms. Mary Muter: The St. Clair River....

Hon. John McKay: —and the St. Clair River. This is kind of curious. How would you actually do that? Would you do it by way of a dam? You've talked about speed bumps.

Ms. Mary Muter: That was what was originally designed and agreed upon, the speed bumps on the bottom of the St. Clair River. The IJC looked at this in their $17-million upper lakes study. They looked quickly at different options, and those options are described in their report on restoring Michigan and Huron levels.

We think that needs to be looked at more broadly. We think this can be done responsibly via some kind of flap gate that goes up and down, or some type of structure in the bottom of the river that could slow the flow.

Before that work even begins, they need to stabilize the riverbed. The riverbed, at the Blue Water Bridge, at the north end of the river, is now 60 feet to 70 feet deep. Ships only need 27 feet to—

Hon. John McKay: Because it's all being channelled out....

Ms. Mary Muter: That's right. With that flow, they removed the rock cover. They removed a sand and gravel bar that acted as a natural weir to the outflow. They cut through that for navigation. They harvest it for sand and gravel. It has been 100 years of human alterations.

There is an opportunity to cover over it, to stabilize the riverbed, and to put some type of structures in. But to do that requires some engineering modelling work. We know that it needs high-level, three-dimensional modelling.

The U.S. army corps has now begun to look at this. We want Canada at the table.

Mr. David Sweetnam: There are some differences, actually, in the science. Water does not flow out through the deepest part of the river. It's restricted by the choke point, the shallowest part of the river. That is where the flow is going to be impeded.

What has been seen in the upper Great Lakes study.... In fact, in 2012 the flow rate of the St. Clair River declined by 12%. That year, we hit an all-time recorded low. Evaporation is playing the controlling part of water levels.

If you look at the historical modelling that's been done, NOAA, the National Oceanic and Atmospheric Administration in the United States, has very clearly shown now that instead of precipitation driving lake levels, it's evaporation and water temperature. There are some significant evolutions in the science that have happened over the last couple of years.

● (1640)

Hon. John McKay: Does that mean that even if they do restore, from 60 feet to 20 feet, it's not going to make any difference? Is that what your answer is?

Mr. David Sweetnam: What will happen is, at a higher water level, this extra conveyance capacity that exists in the river will allow water to flow out quicker, but once it drops down to the current water level regime, the outflow is within less than 1% of what it was before the erosion and dredging occurred, because the water levels are lower.

It doesn't play to a quick five-minute answer. It's a little more complicated than that. I think simplifying it too much actually does a disservice to the actual science that is very well established—

Hon. John McKay: We're all into 30-second answers around here.

The second question had to do with the Canada-Ontario agreement that needs to be finalized. I thought that was a done deal.

Mr. David Sweetnam: The federal government hasn't yet signed it. We're just hoping to push and get the process finished.

Hon. John McKay: Some aboriginal folks told me that Ontario was onside, the aboriginal nations were onside, the municipalities are onside—

Mr. David Sweetnam: Everybody's onside. It just hasn't been signed.

Hon. John McKay: So what's the holdup? What's the drill?

Mr. David Sweetnam: I don't know if it's translation—

Ms. Mary Muter: Canada and U.S....?

Hon. John McKay: Canada and Ontario....

Mr. David Sweetnam: As I understand it from the Province of Ontario, it's just a matter of some translation or something that has to be done, and then actually executing the documents.

Hon. John McKay: We know all about that at this committee. How's my time?

The Chair: You have a moment. I just want to remind you, Mr. McKay, there's more than 30 seconds for the answer if you don't take five minutes to ask the question.

Hon. John McKay: I've been asking very short questions, you'll notice.

The Great Lakes quality agreement, quantity and quality seem to be inextricably linked here. Are you satisfied that this agreement is an agreement that, if implemented, would actually address the issues that all of you have, from wetlands right through?

Mr. David Sweetnam: I think our concern right now is that the magnitude of the impacts of the climate change is going to overwhelm the anticipated effects. I think we may be thinking on a 20-year time scale, so we're a little concerned that the language around water levels isn't quite as explicit in the agreement as, perhaps, we would have liked it to be.

Mr. Mark Gloutney: I think there's been substantive progress in the thought and the deliberation around it. I'm much more optimistic about where it's going to get us, but I think there are some concerns when we look out longer term.

Hon. John McKay: There are a few implementation problems here.

Dr. Jan Ciborowski: Yes, I agree with that too. The timeframes are very short for setting goals, but there's very little in terms of actually implementing them, as we've said.

Ms. Mary Muter: I would just add that the whole question is whether there is adequate funding to actually implement the terms.

The Chair: Okay.

Now we'll move to Mr. Jacob.

[*Translation*]

Mr. Pierre Jacob (Brome—Missisquoi, NDP): Thank you, Mr. Chair.

My question is for David Sweetnam.

You spoke about blue-green algae, which is something that I am quite concerned about, as are many of my constituents. My riding is magnificent. It has mountains and lakes. My riding is Brome—Missisquoi, in the Estrie region. There are many lakes, including Brome Lake, Champlain Lake—I won't list them all—and there are organizations mandated to restore their water quality.

I know you that are working on Georgian Bay and that you provided funding to York University to acquire knowledge on what triggers blue-green algae blooms. First, what influence does the water quality have and what are the dangers to the people who use it? Second, could you also summarize the outcome of that research?

[*English*]

Mr. David Sweetnam: Certainly. From the perspective of the public and the ecosystem use of the water, it could be argued that blue-green algae is part of the ecosystem and therefore part of the natural processes that exist. But I think when we talk about blue-green algae and nuisance algae blooms, we're talking more about the impact they have on the humans who are using the water. From that perspective, even the spectre of a blue-green algae bloom can cause problems with housing values. If there is an actual bloom, whether or not it's toxic, in the interim between it being expressed and it being identified, nobody can touch the water or drink the water, and you can't let your dog go into it, for fear that if it is toxic it's actually going to kill the pet or cause you problems. You can't touch it, because it can be absorbed. You have hepatotoxins—liver toxins—that can actually get into your system and cause significant health problems.

From an economic perspective—in Sturgeon Bay as an example—where blooms recur, you have the spectre of not being able to sell your cottage if that is a progressively worsening condition in that particular geographic location.

From the perspective of inland lakes, we've actually seen increases over the last couple of decades in the incidence of blue-green algae blooms. Part of our actual research was looking at these biochemical triggers that exist and asking why, when blue-green algae are always more efficient at scouring phosphorus out of their environment, they do not always express themselves in massive blooms. The eukaryotic algae—the other algae—dominate until something triggers the blue-green algae, and it takes over.

We were looking at the effect of anoxia in these bottom waters that have detritus, as Dr. Ciborowski was talking about. The normal eukaryotic algae die and go down to the bottom and rot, and they suck all the oxygen out of that water. At that point you go back to prehistoric, pre-oxygen conditions that existed on the earth when the blue-green algaes actually dominated. They are much more efficient at using chemicals other than oxygen in their biochemical processes than the eukaryotic—or oxygen-loving—types of algae are.

As soon as you go anoxic, you can get ferrous iron that can come out of the sediment, and that liberates phosphorus. Phosphorus is used as a kind of fertilizer, if you will, for those organisms, and they can actually migrate up and down in the water column. They can go up to the oxygenated kind of eutrophic areas where they can get to sunlight, and then they can drop themselves down like a diving bell, grab the nutrients they want, and then rise up again through the water levels. So they're actually motile; they can move up and down.

It's those kinds of triggers we've now written a paper about with York University's Dr. Lewis Molot, which has been accepted for publication in *Freshwater Biology*. It's an interesting, kind of esoteric, science that we wanted to find out about.

Once they dominate, then certainly with the amount of phosphorus that's available to them in the Great Lakes system—phosphorus is kind of the limiting nutrient—they can then manifest themselves in these huge surface scums that we all associate with the bloom. But the bloom was already happening in the water column. There were already lots of these organisms in existence throughout that water column.

● (1645)

The Chair: Okay, thank you very much.

We'll move now to Mr. Woodworth.

Mr. Stephen Woodworth: Thank you very much, Mr. Chair, and my thanks to the witnesses. This has been an especially gratifying study for me. It was one that I had requested and I have a great interest in it, living along the banks of the Grand River as I do, and having an interest in the quality of the water that I find all around me.

I would like to direct some questions to you, Professor Ciborowski, if I may, beginning with the Great Lakes nutrient initiative that you mentioned. I guess I'll ask you, first of all, are you involved with that in any way?

Dr. Jan Ciborowski: I am to some extent. Yes, we're helping to sample in some of the areas. One of the biggest challenges in understanding the condition of the Great Lakes is that over time funding available for monitoring and conducting research has declined. We know more about the conditions in Lake Erie than any of the other Great Lakes. We know about the amount of nutrients that are loaded into the lake every year and use that to predict whether we will get algal blooms. In fact, though, many of the tributaries have not been monitored for 10 or 15 years. Fewer and fewer are monitored and we assume that some of those behave the same way as the ones that are.

The Great Lakes nutrient initiative has provided funds to monitor 12 of the Canadian tributaries flowing into Lake Erie that haven't been sampled for about five or six years previously. That includes the Grand, the Sydenham, the Thames, and the Detroit River, which is being monitored 24 hours a day throughout the year, in winter as well as in summer. It is a major impetus of the nutrient initiative to understand what is the linkage between the phosphorus loading and the manifestations of these algal blooms that we're seeing.

● (1650)

Mr. Stephen Woodworth: That's very good news and I appreciate it. What I understand is that although this initiative is focusing on Lake Erie the science or the data and the policy approaches that are developed through the initiative will be transferable to other Great Lakes, and indeed other bodies of water throughout Canada. Is that your understanding?

Dr. Jan Ciborowski: That's absolutely correct. Lake Erie is the poster child because we have the most information, the most scientists, and therefore the best understanding of the relationships. That can certainly be applied to the different Great Lakes. Because we almost have three different lakes in Erie, we can use the shallow part and the deep part to infer about the other parts of the Great Lakes as well.

Mr. Stephen Woodworth: In fact, I've been waiting to try out the word “oligotrophy”, I think it is, which is in the deep part of Lake Erie and constitutes an absence of phosphorus. So I understand there are different levels within those lakes. I also understand that this Great Lakes nutrient initiative is going to lead to the establishment of binational lake ecosystem objectives and phosphorus objectives, and phosphorous load and reduction targets. Is that your understanding also?

Dr. Jan Ciborowski: That is true, and I'm actually on the task group that's charged with estimating that based on the best available science. Presently, the guidelines that have been proposed for Lake Erie have been 11,000 metric tonnes per year. When we have a normal year in terms of rainfall the amount of runoff is below that and we don't have algal blooms. When we get a wet fall or winter, we go well above the normal amount of water and the amount of phosphorus entering can go up to 18,000 or 20,000. That's when we get those very severe blooms.

The evidence seems to be that those targets may be too high given the behaviour of the blue-green algae that Mr. Sweetnam was talking about, and some ideas are that perhaps a 30% reduction may be necessary in some of the watersheds. The question is: is that a realistic approach and how would we ever achieve those reductions given the economic consequences of that and the best management practices we have available?

Mr. Stephen Woodworth: I think we've heard that the Grand River Conservation Authority is in fact working on this same project with a view to best management practices. But I don't know whether we have yet determined what the outcome of that is. Is that being studied as well, that is, the effect of the best management practices that are being developed?

Dr. Jan Ciborowski: That's an important phase of it. The other thing to recognize is that the different rivers have different amounts of contribution from agriculture versus rural and suburban areas. One of the points we try to make is that so much attention seems to be devoted to the Maumee, which is mainly agricultural, that when you have Grand River, which is quite a mix of rural and urban areas, we probably need a different prescription from what we use for some of the other areas. That's an area of great interest to this task force.

The Chair: Time....

Mr. Stephen Woodworth: I was just going to say that the chair is going to cut me off, and I have two more questions.

The Chair: You were right.

We'll move now to Monsieur Jacob.

[*Translation*]

Mr. Pierre Jacob: Thank you, Mr. Chair.

How much time do I have left?

[*English*]

The Chair: You have five minutes.

[*Translation*]

Mr. Pierre Jacob: Okay.

My question is for you, Mr. Sweetnam.

Could the federal government play a preventive or curative role with respect to blue-green algae blooms?

[*English*]

Mr. David Sweetnam: Certainly, I think with respect to the algal blooms that we're seeing in the Great Lakes Basin and the type of work that Dr. Ciborowski is doing and talking about, absolutely, there may be a role in the process there, which I'll leave to the people working in that process to talk about.

In the inland lakes where you have algal blooms, you may not even have anybody in that vicinity and the lake may still be experiencing an algal bloom. It may be that the pH of the rainfall is changing. It may be something completely different, or beyond our control, directly or short-term, that wouldn't necessarily lend itself well to the government intervening particularly with that kind of regulatory solution.

So I think you have to look at the problem specifically. Does that particular location or problem lend itself to being assisted? The answer, if it was yes or no, would be yes, but specifically directed to a particular problem.

● (1655)

[*Translation*]

Mr. Pierre Jacob: Thank you very much.

I will share the rest of my time with Ms. Ashton.

[*English*]

Ms. Niki Ashton (Churchill, NDP): My question is to Ms. Muter.

I'd like you to comment on the connection between what we're talking about today and climate change. Increasingly, the words “climate change” are bad words in the political climate we're in from the government side. I'm wondering if you could make the connection in terms of what you see in the Great Lakes.

Ms. Mary Muter: Climate change is here. It's here. We have clear evidence of it now. The report that's just been released makes it even more scary than we previously thought it was.

In terms of its impact on the Great Lakes, obviously it's warming water temperatures. McMaster University's Dr. Pat Chow-Fraser has found temperatures of 27 degrees where pike populations exist, which is beyond the range that they normally can survive in.

So yes, it's warming up the waters, which allows things like algal blooms to happen much more easily over a longer period of time, but also with increased water temperatures there is increased evaporation. Historically, over the past decade, we have had significantly less ice cover. This past winter is an exception, but previous to that with less ice cover, warmer waters, increased evaporation, there are lower water levels across all the Great Lakes.

Ms. Niki Ashton: Just quickly to follow up, is there a role that the federal government can play here?

Ms. Mary Muter: Of course, there's a role the federal government can play. We all need to be acting to reduce whatever impacts we can, whatever is contributing to climate change, obviously. Reducing greenhouse gas, that's a given, and being able to figure out how we can adjust to this in some way.

We think one of the most important measures is to develop the ability to retain water in all of the Great Lakes facing climate change impacts. The climate change impacts predicted for Lake Michigan and Lake Huron are very significant, but right now we only have the ability to hold water in Lake Superior and Lake Ontario, and to some degree for Lake Erie. But for this huge body of water in the middle, we have nothing.

We are saying that probably the best adaptive management measure that we could put in place is to develop some ability to retain water in all of the Great Lakes, and then have one balanced Great Lakes water quantity board that oversees it all. Right now, we set discharge monthly rates for Lake Superior and Lake Ontario. The outflows are measured on an hourly basis. We have nothing like that for the St. Clair River.

Ms. Niki Ashton: I would just say quickly the importance of federal investment in research. I represent a number of communities near Lake Winnipeg, where there are similar concerns around algal blooms. As you know, the loss of the experimental lakes area in terms of federal funding is a huge loss for the kind of work in terms of prevention and protection that needs to be done.

I'm wondering if perhaps both of you can quickly comment on the loss of federal research and what that means for your work.

Maybe Ms. Muter and then quickly Mr. Sweetnam.

The Chair: You have 10 seconds, so very quickly.

Mr. David Sweetnam: Ontario has now taken it over. It is funded again and it is running, so that's the good news.

Ms. Niki Ashton: Should the federal government be funding research staff?

Ms. Mary Muter: Absolutely. If you think, that's how the phosphorous was first identified as a major contributing factor to algae, and that is the setting within which those kinds of research projects can be carried out. We have no place else like that.

Mr. David Sweetnam: There was just a press release today.

The Chair: Thank you.

We'll move now to Mr. Toet for five minutes.

Mr. Lawrence Toet (Elmwood—Transcona, CPC): Thank you, Mr. Chair.

I'm going to allow Mr. Woodworth to finish with his couple of questions first. Then we'll see if he has time for me.

The Chair: Good luck.

Voices: Oh, oh!

Mr. Lawrence Toet: You're probably right.

Mr. Stephen Woodworth: Thank you very much, Mr. Toet.

I just want to assure my colleague from across the way that the Great Lakes nutrient initiative is in fact the very kind of research that she is pressing for.

In fact, I'd like to ask you again, Professor Ciborowski, particularly since you're involved in the issues around objectives and reduction targets, if you can tell me what the expected timeline is to complete that research and come up with those recommendations.

Dr. Jan Ciborowski: It's a very short timeline. The guidelines are required to be in place by September 2016, I believe, and that has to be after public comment. There are three or four meetings a year of these panels to try to bring the science into line, make the recommendations, and then evaluate them and see if they can be implemented.

● (1700)

Mr. Stephen Woodworth: That's excellent. I'm just happy that the government has pivoted to that issue as quickly as it has.

The second thing I wanted to ask you about was something you said that intrigued me about how “we” are now quantifying risks and preparing maps. I wasn't sure who the “we” was and if that was connected to the Great Lakes nutrient initiative.

Dr. Jan Ciborowski: No, it isn't. This is research in which I am involved with colleagues at the University of Minnesota Duluth, with support from the U.S. EPA and some funding from Environment Canada, to develop maps of where the stresses are the greatest and the lowest, and then match the stress with the biological responses.

I wish I had—

Mr. Stephen Woodworth: So you are actually receiving funding from Environment Canada to do the very kind of research that my colleague from across the way was talking about.

Dr. Jan Ciborowski: Well, we have formerly received funding to create the maps. We don't currently have funding for that.

Mr. Stephen Woodworth: All right. Well, we'll have to look into that. Thank you very much.

I'll return this back to Mr. Toet.

The Chair: You have two minutes, Mr. Toet.

Mr. Lawrence Toet: Thank you.

Ms. Muter, just now you quoted one of our witnesses from the last meeting, Patricia Chow-Fraser, on the temperature increase in the Great Lakes. Can you quantify that for us? That's something she wasn't able to do for us. Do you know what the temperatures were and what they are? You can tell me what they are currently. How much have they risen?

Ms. Mary Muter: I don't think I could give you an exact answer for that, because it depends on where you're sampling, and the Great Lakes are so huge. Also, the temperatures she was talking about were in one of these more shallow bays, so that's why it got up that high. We think that's also a contributing factor to the fish and bird die-offs on the south beaches of Georgian Bay, where the water temperature is warmer.

You're talking about the average temperature perhaps after turnover, after the lakes turn over in the spring, and I don't know that we're doing research at that level. It's—

Mr. David Sweetnam: The number that NOAA is using is five degrees Fahrenheit or about two degrees Celsius in the overall average increase in the Great Lakes water temperature.

Ms. Mary Muter: That research has been done up on Lake Superior. They have extrapolated that down for Lakes Michigan and Huron and Georgian Bay, so to extrapolate is a way to estimate.

Mr. Lawrence Toet: Yes. Okay.

I guess what I find very interesting is that we are bringing forward factual evidence and then saying that we don't really know how much it has increased. That is troubling for us, because when we bring forward testimony that quotes certain studies showing certain things happening, and then we can't give the basis points for that, it does really make it challenging for us to understand what's the degree, what's the change, and how much it has changed.

Ms. Mary Muter: Well, David just told you. It's the U.S. agency. We don't have any Canadian agency that's doing that kind of work.

Mr. Lawrence Toet: Thank you.

Mr. David Sweetnam: We could provide that information to the clerk.

Mr. Lawrence Toet: Thank you.

Going over to Ducks, I have a quick question.

I found it very interesting to see some of the figures that you had here on the economic valuation, the estimated worth of the hectares of land in the Lake Simcoe basin or the wetlands. I found some of those numbers that you came up with there very interesting. Without going into a great deal of detail, because we have a very short time span, I'm wondering if you could give us some idea of how you arrived at those numbers. I'm talking about the $11,172.

Mr. Mark Gloutney: That was a report from the Suzuki foundation, pulled together, and they looked at all of the combined values of all the services you get from wetlands. They're talking about phosphorous removal. They're talking about recreational opportunities. They're talking about flood storage capacity. They're talking about—it has been a while since I read the report—carbon issues, carbon sequestration, greenhouse gases, and recreational value. They considered all of those goods and services that you get from having wetlands within the landscape.

The Chair: Thank you very much. Thank you, Mr. Toet.

We move now to Mr. Bevington, for five minutes.

Mr. Dennis Bevington: Thanks, Mr. Chair.

I wanted to touch on the wetlands as well, because over the last two years in Parliament we've heard much about how this present government has taken away the requirement of environmental assessment for farmers for drainage ditches. They talked about it quite a bit. I'm thinking to myself there are hundreds of thousands of farmers, and hundreds of thousands of drainage ditches. At what point do non-regulated drainage ditches add to the problem of wetland removals in this country?

● (1705)

Mr. James Brennan: The drainage ditches are a vehicle through which wetlands are drained. So we have been arguing for some time that if you're going to address the problem, you need to address the root of the problem, which is the loss of the wetland on the landscape.

Mr. Dennis Bevington: So basically that would be my concern. If we're taking away the need for anyone to get licences or permission to increase the drainage in a particular area, then through that process we may well be losing lots of wetlands. Is that assumption valid?

Mr. Mark Gloutney: A core part of all of the work we've done from the policy perspective is really identifying the need to keep the wetlands on the landscape. Wetland policies need to look at all the wetlands that exist on the landscape and identify those that need to be protected. There are instances across the country where you have unregulated and unrestricted drainage happening, and it's contributing to losses of wetlands.

Mr. Dennis Bevington: Fair enough, then. I just want that point to be well understood by my colleagues here.

Professor Ciborowski, I brought up the TFA. There was a study done in 2002 that showed elevated levels of this compound in the lakes. Now, that was 12 years ago. Do you mean there hasn't been any further study of this particular compound?

Dr. Jan Ciborowski: There could very well be, but it's outside my area of expertise. That's why I can't give you a direct answer on it.

Mr. Dennis Bevington: Okay. How would we find out what chemicals are being tested for in the Great Lakes right now? What is the agency that would provide that information?

Dr. Jan Ciborowski: That would be Environment Canada on the Canadian side and the EPA on the U.S. side that are doing those—

Mr. Dennis Bevington: Are they publicly listing compounds that they've tested for?

Dr. Jan Ciborowski: They're part of the routine monitoring for the Great Lakes themselves. But again that is being cut back to some extent. The way monitoring proceeds on the Great Lakes right now is that each Great Lake is targeted for an intensive year of study in rotation. So last year was the intensive year for Lake Ontario; so there should be current information collected for Lake Ontario from last year. This year is the intensive year for Lake Erie, so the parties will be collecting data for the conditions in Lake Erie.

Mr. Dennis Bevington: Do you see anything that we should be testing for in those lakes? Are there chemicals that you feel need to be looked at more in depth? That's a little bit of a pun, but....

Dr. Jan Ciborowski: That's a fundamental part of monitoring, and the sediments in the water are monitored on a regular basis. Keeping track of what those trends are is another part where we don't have the resources. We have loads and loads of information that sits there in the databases because we don't have the scientists to interpret that information and make it public. So the information could very well be there, but it's sitting on a database rather than being interpreted and publicized.

Mr. David Sweetnam: I just had a point with emerging chemicals. For example, everybody liked this idea of body washes that had antimicrobial properties, and the personal care product companies started to load nano-silver into these products, which bioaccumulate. They're persistent in the environment. There's no connection between adding something to a personal care product and water quality. There's no scrutinization process that connects those two right now, which leads us to point to this precautionary approach in order to avoid those things before you allow them. If there was some linkage between regulation of any product that ultimately may make its way into the water body, I think you could actually start to be a little more proactive than reactive.

The Chair: Thank you.

We'll move now to Mr. Storseth for the last five minutes.

● (1710)

Mr. Brian Storseth (Westlock—St. Paul, CPC): Thank you very much, Mr. Chair.

I'd like to thank the witnesses for coming today. It's always entertaining. My opposition colleagues in the NDP, if it breathes, they'll tax it. If it exists, they'll regulate it. When it dies, they'll tax it again.

To be clear, it's not the ditches themselves that are the issue, but the wetlands that we need to make sure we maintain and preserve. That's the ultimate solution.

Mr. James Brennan: Yes. It's the wetlands loss that's the issue.

Mr. Brian Storseth: So if we regulate the ditches as best as we can, will it help us preserve the wetlands?

Mr. James Brennan: I would say likely not.

Mr. Brian Storseth: Yes, okay.

You did have some interesting comments, I found, on the 65% to 80% of wetlands losses in the study you were talking about. What I didn't hear you say was what the major reason is, if you know, for wetlands loss in the Great Lakes area.

Mr. Mark Gloutney: The primary loss is urban expansion and development and industrial expansion of our urban centres.

Mr. Brian Storseth: So it's not oil and gas.

Ms. Mary Muter: No, pollution is a factor.

Mr. Brian Storseth: Okay. I'm not asking about pollution.

Mr. Mark Gloutney: In terms of direct loss, it's that, plus ongoing agricultural activities on the landscape.

Mr. Brian Storseth: Do you know what percentage of that 65% to 80% would be urban expansion?

Mr. Mark Gloutney: If you looked at that number, the bulk of that number is made up from conversions that happened as agriculture cleared the land. So much of that wetlands loss was a result of clearing the land and settling the land. It's probably safe to say that 80% of that is agriculturally based.

Mr. Brian Storseth: Then it came to the urban expansion.

Mr. Mark Gloutney: Now it's changed.

Mr. Brian Storseth: Ms. Muter, you mentioned pollution. Could you add to that?

Ms. Mary Muter: Pollution in places like Hamilton Harbour—that's very contaminated waters, obviously. Wetland plants cannot grow in that kind of habitat, and it ends up being a monoculture of one or two species that can thrive in polluted waters.

Mr. Brian Storseth: Excellent, thank you. I just wanted to clarify that.

My other question was in regard to your talking about habitat rehabilitation. This is something we've talked about in the past, especially with the study that we did on habitat. Could you tell me about some of your successful habitat rehabilitation projects and if there's one direction in particular that seems to be more successful. Then, because I'm sure I'm running out of time, the costs that are attributed to that as well?

Mr. Mark Gloutney: The rehabilitation restoration typically involves restoring the hydrology to the system. If the wetland was drained by a ditch or by some diversion of the water, restoring the hydrology to it.... If you create the capacity for the basin to hold water again, the systems come back. They come back to life, and they come back to life very quickly. That's typically the approach that we take.

What are the economics around that? It's expensive to do the restoration. It costs in the order of $10,000 to $20,000 per hectare to put the wetlands back on the landscape.

Mr. Brian Storseth: Excellent, thank you very much.

Mr. James Brennan: If you wanted an example—

Mr. Brian Storseth: Yes, please.

Mr. James Brennan: There are many. Second Marsh in Oshawa is certainly one. Tiny Marsh in Simcoe County is another. There are quite a number of examples to draw from.

Mr. Brian Storseth: Thank you very much.

The Chair: You have a full minute left.

Mr. Brian Storseth: I do? Excellent, thank you.

In regard to the $10,000 per hectare, basically, that we're talking about, would that be in line with other regions and areas—for instance, we were talking about Lake Winnipeg—or are there exponential costs when it comes to the Great Lakes?

Mr. Mark Gloutney: The big factor in the Great Lakes is really the value of the land and the cost of the underlying access to the land. If you're able to do it on a piece of property where you're working with a landowner who wants to see the restoration happen and you don't accrue any land costs, the costs are relatively similar.

Mr. Brian Storseth: We talked about the urban sprawl aspect of this. Have some of the developers seen that this has become kind of a niche thing that benefits their developments? Are we seeing more of that?

Mr. Mark Gloutney: We certainly have seen lots of examples of that in places like Winnipeg, where we've seen some really big commitments to doing wetlands as part of stormwater treatment approaches. It's actually increasing the value of the housing market because people want to be able to live and see water, so having natural-looking wetlands within development complexes has been hugely beneficial within many places. It is starting to come in Ontario. The uptake has been a slower process than we expected to see.

● (1715)

Mr. Brian Storseth: Certainly when you talk about partnerships it becomes important.

The Chair: Thank you very much, Mr. Storseth, for the last word.

I want to thank all of our witnesses for your participation today.

With that, we'll declare this meeting adjourned.