The Case of Eco-Certification in Manitoba's Commercial Fisheries

Path forward for Manitoba fishers

IISD REPORT

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Written by Emily Kroft with analysis support from Marina Puzyreva

Photo: Fish Forward

Land Acknowledgement

The International Institute for Sustainable Development's Winnipeg office is located on Treaty 1 territory—the traditional land of the Anishinaabeg, Cree, Oji-Cree, Dakota, and Dene Peoples and the homeland of the Métis Nation. The Manitoba fishing industry is deeply rooted in Indigenous cultures that have been living in partnership with the land and water since time immemorial. The majority of fishers involved in the work that went into this report are from Indigenous communities whose knowledge of sustainable fishing long predates the arrival of European settlers in this land we call Manitoba. It is with great gratitude that we acknowledge not only the land we are on, but the people to whom the land belongs and who contributed so greatly to this research.

Executive Summary

Manitoba is home to a vibrant commercial net-fishing industry consisting of licensed commercial fishers, hired helpers, and related workers. The majority of those involved are located in rural, northern communities. Each year, this industry produces approximately 13 million kg of freshwater fish, making Manitoba the second-largest commercial producer of freshwater fish in Canada after the Great Lakes area in Ontario. The commercial freshwater fishing industry is particularly significant to Manitoba's Indigenous population, both culturally and economically. Manitoba is home to approximately 2,000 licensed fish harvesters, of whom 85% are Indigenous and who rely on commercial net-fishing as their primary income source. In Manitoba, there has been a recent increase in interest in eco-certification for commercial freshwater fisheries due to a variety of factors; these include the fact that eco-certification has been made a provincial priority, concern over the risk of losing markets due to a lack of eco-certification, and the availability of government funding and support. Eco-certification programs offer third-party assessments of whether a product adheres to a certain set of sustainability requirements.

It is estimated that 80% of the commercial catch in Manitoba is sold to international markets (primarily in the United States and Europe, with additional markets in Asia and the Middle East), and these markets are slowly changing to become more sustainability conscious. Increasingly, restaurants and retail establishments are making public commitments to source their products sustainably because consumers are increasingly demanding it. Over the past decade, Manitoba fisheries have already seen lost revenues and business opportunities due to their lack of certification. A prime example of this is when both Walmart USA and Sam's Club stopped purchasing Manitoba-caught fish because the province's commercial fisheries were neither eco-certified nor on an established path to becoming certified. Manitoba's commercial fisheries have also lost some potential marketing opportunities, even after having eco-certified fish available, due to insufficient quantities of the certified fish. Manitoba has not yet reached a threshold of lost opportunities where large quantities of fish have not been sold at all; as a result, quantifying this cost is challenging. Due to the high levels of uncertainty involved in the pace of market shifts, the precautionary principle should be strongly considered in the case of Manitoba's commercial fisheries.

The marketing benefits of eco-certification for Manitoba's commercial fisheries include avoiding lost market opportunities due to lack of eco-certification, avoiding lost revenues due to insufficient quantity of eco-certified fish, and opportunities for brand building. Costs of pursuing eco-certification for Manitoba's non-certified fisheries include monetary and time investments and a commitment to long-term data collection. Also required is a commitment by the industry and management agency to work together over the long term. For larger lakes, the cost-to-benefit ratio for eco-certification is estimated at $250[1] in benefits for every $1 invested

[1] All monetary amounts are in Canadian dollars.

over 5 years. For smaller lakes, the estimated benefits are slightly lower, with $16 in benefits for every $1 invested over 5 years.

Globally, several co-benefits to fisheries eco-certification have been observed. These benefits include socio-economic factors, such as improved image, improved fishing practices, reduced rule breaking, increased trust and cooperation between industry and managers, and increased collaboration among harvesters. However, the extent to which specific co-benefits are experienced can differ depending on whether the certified fishery is a "pioneer" in eco-certification in their market or if they are joining the bandwagon later. In Manitoba's two eco-certified fisheries, some of these co-benefits are already being observed because they have become early adopters. There are also ecological co-benefits related to eco-certification, such as improving the health of key fish populations, which have also been observed in Manitoba's eco-certified fisheries.

The report concludes with seven key recommendations:

1. Government should prioritize funding to the greatest extent possible for fisheries trying to become certified.
2. The provincial government should hire more branch staff who can work with fisheries through pre-certification and certification while also allocating sufficient funds to support those staff in long-term data collection.
3. All parties involved should continue investing time in strong personal relationships between fishers, other industry players, government, and those involved in certification.
4. Indigenous Knowledge systems and ways of life must be respected at all times by all involved (both government and industry), even when Western-style data is required for the eco-certification process.
5. Build awareness of how eco-certification works, making relevant and detailed information as accessible as possible to fishers.
6. When resources are too limited to fund full eco-certification, steps should still be taken toward improving sustainability, even if those steps are small.
7. Industry players should take full advantage of the publicity opportunities that come along with eco-certification.

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- Manitoba is home to Canada's second-largest commercial freshwater fishing industry. The industry provides critical employment to many northern and Indigenous communities. It is estimated that 85% of Manitoba's commercial fishers are Indigenous.
- Industry interest in eco-certification in Manitoba's commercial fisheries has increased over the past decade due to global demand for sustainably sourced fish products, provincial prioritization, availability of government support, and enhanced communication of market pressure for eco-certified fish by Manitoba's fish buyers to commercial fishers.
- We profiled four Manitoba fisheries as case studies, all at different points along the eco-certification process—Wanipigow, Negginan, Cedar Lake, and Osh-koo-na-ning (Waterhen Lake)—as well as one out-of-province comparison (Lake Erie).

1.1 Overview of Manitoba's Commercial Fishing Industry

Manitoba is home to a vibrant commercial net-fishing industry, consisting of licensed commercial fishers, hired helpers, and related workers. The majority of those involved are located in rural, northern communities (Department of Water Stewardship, 2009). Each year, this industry produces approximately 13 million kg of freshwater fish, making Manitoba the second-largest commercial producer of freshwater fish in Canada after the Great Lakes (Galbraith, 2020a). This is not surprising, given that 26% of Canada's inland commercial fisheries are located in Manitoba (Galbraith, 2020a). Manitoba's commercial fishing industry also represents an important source of income for Manitobans and provides tax revenue to the provincial and federal government. In 2017–2018, the revenue generated amounted to approximately $30 million[2] in direct income to fishers, and an additional $73 million in value-added revenues (Galbraith, 2020a). In the winter season specifically, Manitoba is Canada's largest commercial freshwater fishery. The freshwater commercial fishing industry in Manitoba generates over $100 million annually for the total local economy (Rutgers, 2022).

The commercial freshwater fishing industry is particularly significant to Manitoba's Indigenous population, both culturally and economically. Manitoba is home to approximately 2,000 licensed fish harvesters, of whom 85% are Indigenous and who rely on commercial net-fishing as their primary income source (Rutgers, 2022). This number does not include the over 700 Indigenous people working as hired helpers and packers. 85% of Manitoba's licensed commercial fishers are Indigenous (Rutgers, 2022). The majority of these workers live in remote, northern communities

[2] All monetary amounts are in Canadian dollars.

where economic opportunities are scarce, making economic opportunities related to fishing especially important (Department of Water Stewardship, 2009).

Box 1. Manitoba fisheries and the tourism industry

Many Indigenous people are actively involved in commercial tourism related to fishing, which also depends on healthy fisheries (Department of Water Stewardship, 2009). Nine hundred Indigenous people work in commercial tourism lodges and outfitting operations (Galbraith, 2020a). Overall, northeastern Manitoba is home to ten Indigenous outfitting operations, and 46 out of the 64 First Nations communities in the province are actively involved in the industry either through commercial harvesting itself, or through commercial tourism related to fishing (Galbraith, 2020a). This results in approximately 294 on-reserve businesses being either directly or indirectly affected by the commercial freshwater fishing industry (Galbraith, 2020a). The scope of the analysis for this report will focus only on commercial fishing; however, further information on non-commercial fishing in Manitoba can be found at https://www.manitoba.ca/nrnd/fish-wildlife/.

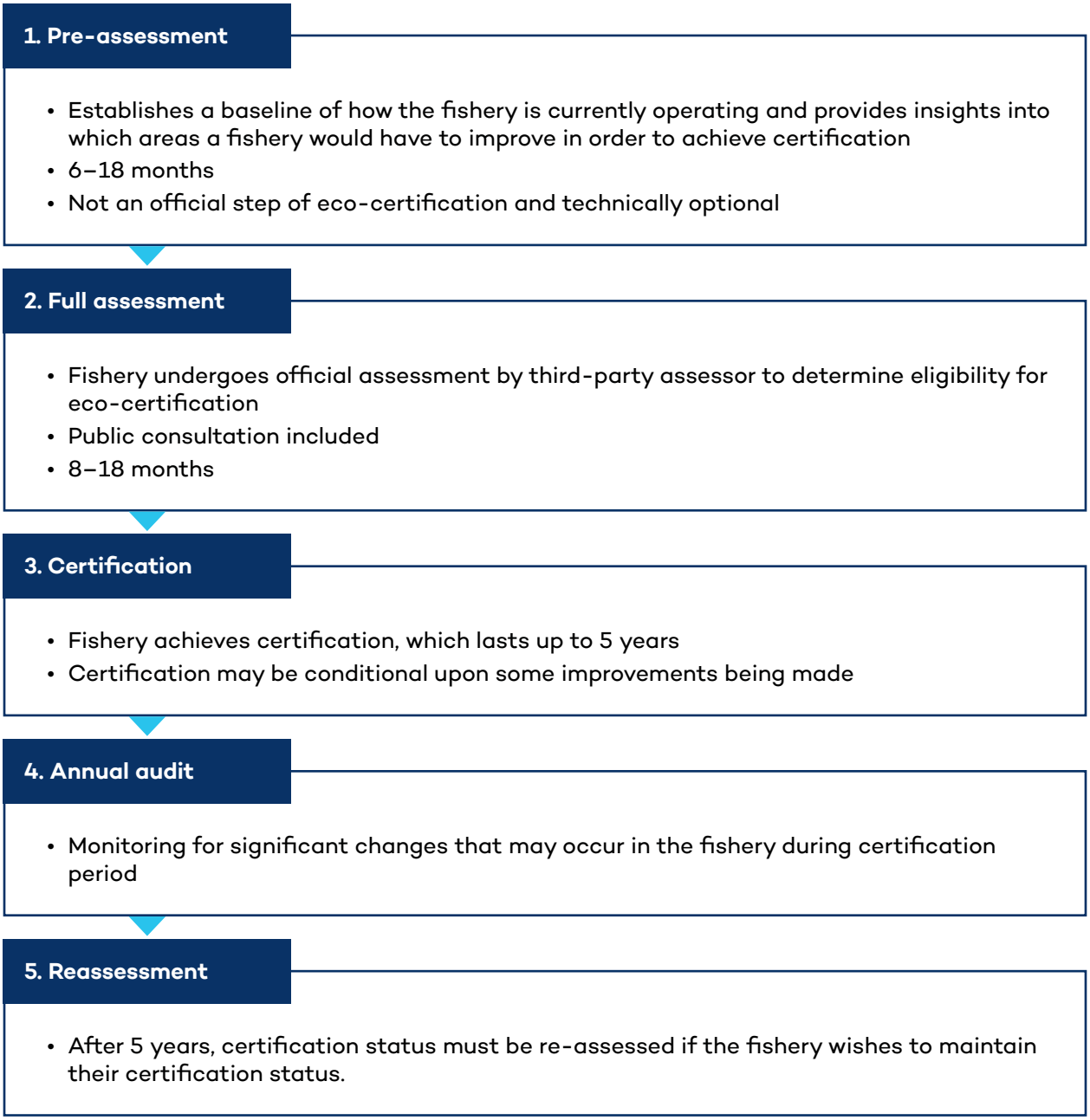
The primary species that are commercially fished in Manitoba are walleye *(Sander vitreus)* (46%), lake whitefish *(Coregonus clupeaformis)* (19%), northern pike *(Esox lucius)* (15%), suckers *(Catostomidae)* (12%), and sauger *(Sander canadensis)* (3%) (Galbraith, 2020a). Other species are also being harvested, in smaller quantities, including yellow perch *(Perca flavescens)*, goldeye *(Hiodon alosoides)*, common carp *(Cyprinus carpio)*, white bass *(Morone chrysops)*, cisco *(Coregonus artedi)*, lake trout *(Salvelinus namaycush)*, freshwater drum *(Aplodinotus grunniens)*, and various suckers *(Catostomidae)* (Galbraith, 2020a). Walleye is of particularly high value, making up approximately 70% of the average landed value (Galbraith, 2020a). Appendix A provides the breakdown of the amounts of each type of fish (units are kg) sold annually by the commercial fishery and their associated market revenue. Readers should note that these values are accurate to the time of reporting but can fluctuate from year to year.

1.2 Reasons for Recent Increase in Interest in Eco-Certification

In Manitoba, interest in eco-certification has recently increased for commercial freshwater fisheries. Eco-certification programs offer third-party assessments of whether a product adheres to a certain set of sustainability requirements (Figure 1). This certification assures consumers that the product has been sustainably made. In the case of fisheries, eco-certification provides assurance to consumers that the fish they're buying was produced in a fishery adhering to sustainability principles as set out by the certifying body and assessed by a third party. In Manitoba, the primary eco-certification body involved to date is the Marine Stewardship Council (MSC), but internationally there are other eco-certification bodies for fisheries, as well, like Friend of the Sea, Oceanwise, and Seafood Watch. Eco-certification of freshwater fisheries is a

newer and less common practice than eco-certification of marine fisheries, so the total number of eco-certified freshwater fisheries in the world is quite limited. The recent increase in interest in eco-certification in Manitoba has been driven by multiple factors.

Figure 1. Rough timeline of the eco-certification process (may vary depending on certifier)



Source: Author.

1. Eco-certification as a Provincial Priority

Political leadership at the provincial level was instrumental in kick-starting eco-certification in Manitoba (Department of Water Stewardship, 2009). In the early 2000s, the eco-certification of Manitoba's commercial fisheries was made a provincial priority (Department of Water Stewardship, 2009). It was during this time that Osh-koo-na-ning became the first commercial fishery in the province to achieve MSC eco-certification (Knapman et al., 2023). This first certification was an important factor in getting other major fisheries in the province on board with the concept of being eco-certified, as it created a real-life case study of a Manitoba fishery becoming certified and benefiting from the certification. Since then, Manitoba's major commercial fisheries have all expressed interest in achieving eco-certification (Klein, 2023). However, only two have attained certification (Osh-koo-na-ning and Cedar Lake) as of the date of this research.

In 2018, the Indigenous Inland Commercial Fisheries Initiative (IICFI) was established when the Manitoba government withdrew from the Participation Agreement with respect to the Freshwater Fish Marketing Act in 2017 to support a shift to open fish marketing in Manitoba (Galbraith, 2020). The program is administered by Indigenous Services Canada's regional office and funded by the Strategic Partnerships Initiative (Galbraith, 2020). The goal of this program is "to help sustain and grow the Indigenous commercial fishery in Manitoba and Saskatchewan" (Galbraith, 2020). IICFI was specifically credited by a representative from the Cedar Lake fishery as having been instrumental in the achievement of eco-certification (G. Gillies, personal communication, September 21, 2023).

The Manitoba government has also made a significant financial investment in support of the eventual eco-certification of Manitoba's fisheries (McLeod et al., 2023). The province put $2.5 million in 2022 toward sustainable practices and ultimately the eco-certification of Manitoba's commercial fisheries (Fielding, 2022). Further, in June 2023, the province announced an additional $1.5 million in funding to the Sustainable Fisheries and Certification Program for additional support of sustainable commercial fisheries (Province of Manitoba, 2023).

2. Risk of Losing Buyers

A major factor in the decision of fisheries to become eco-certified has been the economic risk of not becoming certified (Moneyas, 2023). After Manitoba's fisheries lost a series of major marketing opportunities in the early 2000s–2010s because of not being eco-certified, some fishers became interested in eco-certification as a means to avoid future losses (Mackay, 2023). In the case of Poplar River, the fishery realized that if their largest buyer of lake whitefish were to similarly decide to buy only certified fish, this would result in a loss of nearly half their sales (Mackay, 2023). It was these types of risks that ultimately led them to begin the eco-certification process (Mackay, 2023). Thus, it seems that the increase in interest from the perspective of fisheries is driven more by the fear of lost markets if they do not eco-certify than the potential for new markets if they do eco-certify.

3. Availability of Government Funding

Another major factor in determining whether a fishery may want to pursue eco-certification is the availability of government resources to help them manage the large costs associated with becoming eco-certified (Mackay, 2023). The cost of becoming eco-certified is higher than most local fisheries can cover (it can exceed $250,000 for full certification), and this alone can put eco-certification out of reach, even for those who would otherwise be interested (Moneyas, 2023). Support from both the federal and provincial levels of government over the past several years, through programs like the Collaborative Stock Monitoring Program, IICFI, and the Sustainable Fisheries and Certification Program, has played a crucial role in getting fisheries onto the path of potential certification (G. Gillies, personal communication, Sept. 21, 2023).

2.0 Overview of Case Study Fisheries.

The following sections of this report draw heavily from observations from five case studies, all of which are at different stages in the certification process. This section gives brief descriptions of each case study and provides some context for how each one fits into the certification landscape. The first four case studies are from within Manitoba, and the fifth is from an eco-certified fishery in the Great Lakes area, to provide an out-of-province comparison (Figure 2).

Figure 2. Locations of case study fisheries

Source: Author's diagram.

Fishery name	Osh-koo-na-ning (Waterhen Lake)
Location	Northern Manitoba
Status of eco-certification	MSC-certified for walleye and northern pike
Year of eco-certification	2014, recertified in 2020

Osh-koo-na-ning is located in northern Manitoba between Lake Manitoba and Lake Winnipegosis and was originally certified by MSC in 2014 for walleye and northern pike (Bostrom et al., 2020). It is a winter gillnet fishery, meaning that fish are caught during the ice-on period by using ice-jiggers (MSC, 2017). The lake is 161 km^2 and is run primarily by First Nations and Métis people, whose communities have been practising fishing and hunting on this land for generations (Bostrom et al., 2020). Seventeen of the 21 commercial fishing licences on Osh-koo-na-ning are held by members of the Skownan First Nation and the Mallard Métis community (MSC, 2017), and at least 50 people are employed by the Osh-koo-na-ning fishing industry (MSC, 2017). In order to participate in the fishery, fishers must become members of the Osh-koo-na-ning Winter Fishers Association, which binds them to a series of by-laws that limit the number of total commercial licences (Bostrom et al., 2020). When Osh-koo-na-ning became MSC-certified in 2014, it became the first certified freshwater fishery in the Western hemisphere (MSC, 2017). Walleye and northern pike are not the only species harvested at Osh-koo-na-ning, but together they make up 70% of the total harvest by weight (Bostrom et al., 2020). Smaller parts of the catch, which are not certified, include yellow perch, sauger, and white sucker among others (Bostrom et al., 2020). The quota on walleye for Osh-koo-na-ning is 36,300 kg, but the actual catch has been below this every year for the past decade, with a 5-year average of 17,627 kg for the 2017–2021 period (Bostrom et al., 2020; Knapman et al., 2023). For northern pike, the current quota is 40,000 kg, but the catch has been consistently below this value for several years, with the 5-year average for the harvest from 2017–2021 being 15,668 kg (Knapman et al., 2023).

Fishery name	Cedar Lake
Location	Northern Manitoba
Status of eco-certification	MSC-certified for walleye and northern pike
Year of eco-certification	2022

Cedar Lake is located just north of Lake Winnipegosis and was certified by MSC in 2022 for walleye and northern pike (Knapman et al., 2022). The lake is 1,353 km^2, making it the fifth-largest lake in Manitoba (Knapman et al., 2022). The primary species harvested on Cedar Lake are walleye, northern pike, lake whitefish, and "mullet,"[3] but of these, only walleye and northern

[3] "Mullet" comprises three species—white sucker, longnose sucker, and shorthead redhorse—which are sold together for marketing purposes.

pike are certified (Knapman et al., 2022). Fishers who wish to participate in the fishery are required to be members of Cedar Lake Fisheries Inc. (formerly Napanee Bay Fisheries Coop Inc.) (Knapman et al., 2022). The fishery is primarily Indigenous-owned, with Easterville being the main centre of production (Klein et al., 2020). The average annual commercial walleye harvest is relatively stable at 202,000 kg (total allowable catch is 232,100 kg), and the average annual commercial harvest for northern pike is 172,000 kg (total allowable catch is 366,000 kg) (Knapman et al., 2022). Cedar Lake operates both a summer and a winter fishery (Knapman et al., 2022).

Fishery name	Negginan (Poplar River)
Location	Lake Winnipeg
Status of eco-certification	Undergoing MSC assessment for lake whitefish
Year of eco-certification	N/A

Poplar River or Negginan First Nation is located by the outflow of the Poplar River, on the eastern shore of Lake Winnipeg. Approximately 50 fishers work out of the Negginan fishing station (MacKay, 2023). The fishing station is First Nations-owned and -operated and is located on the reserve (MacKay, 2023). The fishery produces approximately 600,000 kg of fish per year, with the primary target species being walleye in winter and spring and lake whitefish in the fall (Grabowski, 2023). The fishery operates in spring, fall, and winter (MacKay, 2023). Negginan fishery performs collaborative stock monitoring annually (MacKay, 2023). They are not eco-certified but have recently completed the pre-certification process of getting their lake whitefish MSC-certified (MacKay, 2023). They are an agent of Freshwater Fish,[4] and their harbour is overseen by Small Craft Harbours Canada (MacKay, 2023). When Negginan achieves certification, they will become the first producers of eco-certified lake whitefish in the world (MacKay, 2023).

[4] Freshwater Fish (recently rebranded from Freshwater Fish Marketing Corporation) is a federal government corporation that buys and markets Canadian fish and seafood. Historically, the Freshwater Fish Marketing Act required freshwater fisheries to sell their product through Freshwater Fish, but since 2016, fisheries have had the option to sell through Freshwater Fish or choose other options.

Fishery name	Wanipigow
Location	Lake Winnipeg
Status of eco-certification	Not eco-certified
Year of eco-certification	N/A

Wanipigow First Nation is located on the eastern shore of Lake Winnipeg, close to Hecla Island, and is also called Hollow Water. The community is home to approximately 1,000 people in total (Shawenim Abinoojii, 2023) and approximately 60 licensed fishers as of 2019 (Grabowski, 2021a), although since the quota buy-backs, the number of fishers who are active in the fishery has decreased (Moneyas, 2023). The fishery produces approximately 50,000 kg of fish per year, with walleye being the primary target species, although this number has been slightly lower in the last couple of years (Grabowski, 2021b). Fishing is a major industry in Wanipigow, dating back since time immemorial, and is now organized through the Hollow Water Fishers Co-operative (Moneyas, 2023). The fishers of Wanipigow market their catch through Freshwater Fish (Moneyas, 2023). At the time the writing of this report began, they were not eco-certified or in the process of becoming eco-certified, but have since entered into the pre-certification process (Moneyas, 2023). The biggest barrier to Wanipigow pursuing eco-certification at the beginning of research was identified as the financial cost (Moneyas, 2023).

Fishery name	Lake Erie Walleye Fishery (out-of-province comparison)
Location	Ontario Great Lakes
Status of eco-certification	MSC-certified for walleye and yellow perch
Year of eco-certification	2015, recertified in 2021

Lake Erie became MSC-certified for its yellow perch and walleye in 2015 (Adlerstein et al., 2015). The commercial fishery on Lake Erie is quite a bit larger than Manitoba's commercial fisheries. Lake Erie's fishery employs over 1,000 people, and in 2022 the commercial walleye harvest was 5,987,419 kg (Graham, 2023). Management of the Lake Erie fishery is slightly more complicated than Manitoba's fisheries because it is shared between multiple jurisdictions spanning both Canada and the United States (Adlerstein et al., 2015). This can lead to some complex policies that are relevant to certification, for example, although walleye is certified for Ontario in Lake Erie, in Ohio, it is illegal to commercially harvest walleye (Adlerstein et al., 2015). This means that at the time of certification, walleye was being fished commercially in Lake Erie only from the Canadian side, not the American side (Adlerstein et al., 2015). For management purposes, the lake is divided into four management units, so because of this system, not all walleye in Lake Erie are covered by the certification (Adlerstein et al., 2015). The different jurisdictions involved are each allowed a share of the total allowable catch (Adlerstein et al., 2015). For the Canadian portion of the fishery, the majority of the total allowable catch

is allocated to commercial fishing (Adlerstein et al., 2015). In 2014, when an assessment of the fishery took place, the quota for walleye was four million fish (Adlerstein et al., 2015).

In the case of the Lake Erie walleye fishery, factors surrounding eco-certification were similar in some ways to Manitoba; however, there are some key differences that one must consider when comparing it with Manitoba. First, the eco-certification of Lake Erie was initiated, led, and paid for by the fishery (Graham, 2023). This is different from the situation in Manitoba, where the government has been much more actively involved in the certification as well as in financially supporting the process. Another key difference between Lake Erie's and Manitoba's walleye fisheries is that Indigenous fishers and communities do not play a major role in the fishery in the former (Graham, 2023). The majority of fishers are from settler Canadian backgrounds and therefore do not face the same challenges as Indigenous fishers living in remote northern communities (Graham, 2023). Lake Erie is also located in a more densely populated region of Canada than most of Manitoba's fisheries, which allows for less travel time in getting fish from boats to major processing facilities (Graham, 2023). There are eight fish processing facilities located directly on the shores of the lake (Graham, 2023).

3.0 Opportunities and Risks of Eco-Certification for Manitoba's Commercial Fisheries

Key Point Summary

- International markets are shifting in favour of eco-certified fish.
- Thus far, lost market opportunities have not been large enough in scale to seriously damage Manitoba's commercial fishing industry, but experts agree that the markets are shifting toward a point where that scenario is likely.
- Return on investment for eco-certification may differ by lake size, with larger lakes reaping higher benefits per dollar spent on eco-certification.

3.1 The Marketing Benefits of Eco-Certification for Manitoba's Commercial Fisheries

Eighty percent of the commercial catch in Manitoba is sold to international markets (primarily in the United States and Europe, with additional markets in Asia and the Middle East), and these markets are slowly changing to become more sustainability conscious (Rutgers, 2022). The European market in particular is becoming increasingly interested in purchasing eco-certified fish products (Peiró-Signes et al., 2022). In North America, there has also been an increase in interest from the retail sector in sustainable fish (Karr, 2023). The following section illustrates some of the benefits of pursuing eco-certification for Manitoba's non-certified fisheries.

Avoiding Lost Market Opportunities Due to Lack of Eco-Certification

Over the past decade, Manitoba's fisheries have already seen lost revenues and business opportunities due to fisheries not being certified (Rutgers, 2022). A prime example of this is when both Walmart USA and Sam's Club stopped purchasing Manitoba-caught fish because the province's commercial fisheries were neither eco-certified nor on an established path toward it (Galbraith, 2020). The estimated revenue loss from this particular event is estimated at $2.8 million per year (Rutgers, 2022). Similar incidents have also appeared in the European market, such as when the German company BOFROST decided against purchasing northern pike from Manitoba because it was not eco-certified (Galbraith, 2020). Non-certified fisheries that do not become certified, such as Wanipigow and Poplar River, would continue to experience this loss of market opportunity and potentially an associated loss in revenue as eco-certification becomes more strictly demanded (Karr, 2023).

Avoiding Lost Revenues Due to an Insufficient Quantity of Eco-Certified Fish

Manitoba's commercial fisheries have also lost some potential marketing opportunities, even after having eco-certified fish available, due to insufficient quantities of the certified fish. In 2014, Sterkfish, in The Netherlands, inquired about the purchase of one million kg of MSC-certified walleye from Manitoba, but the province could not provide this given its small number of certified walleye fisheries (Galbraith, 2020). In a similar incident, Whole Foods asked to purchase Manitoba MSC-certified walleye for 80% of its stores in the greater Chicago area, but once again, Manitoba was unable to provide enough to move forward with this opportunity (Galbraith, 2020). Other companies, such as Highliner Foods and Mariner Neptune, have also expressed interest in purchasing all certified walleye from Manitoba once an adequate supply is reliably and consistently available (Galbraith, 2020). These examples illustrate why it is in the best interests of all of Manitoba's commercial fisheries to improve the total supply of eco-certified freshwater fish. While, in some cases, scarcity of a product can be advantageous, in this case, the listed examples provide evidence that too much product scarcity may be limiting opportunities, even for commercial fisheries in the province that have obtained eco-certification. The selected non-certified fisheries as case studies in this report (Wanipigow and Poplar River) are particularly relevant examples because they are part of the larger Lake Winnipeg fishery, which produces more total catch than any other lake in the province (Natural Resources and Northern Development, Manitoba Fisheries Branch, 2023). Therefore, if these fisheries don't become certified, that will have marketing consequences not only for themselves and for Lake Winnipeg but for the Manitoba fishing industry as a whole.

Challenges in Predicting the Pace of Future Market Shifts

Manitoba has not yet reached a threshold of lost opportunities where large quantities of fish have not been sold at all; as a result, quantifying this cost is challenging (Klein, 2023). Up to this point in time, the marketing opportunities that were lost have mainly meant selling the equivalent number of uncertified fish to a different market (Karr, 2023). There have also been some instances in which buyers have threatened to pull away from Manitoba's fishing industry if eco-certification was not achieved but were then swayed to stay when presented with concrete evidence that fisheries were working toward eco-certification (through entering into Fishery Improvement Projects (FIPs), etc. (Karr, 2023). This adds a level of uncertainty to the future of Manitoba's uncertified fisheries because the market trends are clearly shifting toward eco-certification, but the speed at which we will reach the critical point of reduced market opportunities is highly unpredictable. As our interviewee from Freshwater Fish told us, "And that's kind of like I said, scary, because, you know, when's that point? [Are] You gonna come and all of a sudden: 'Oops … we have this fish. We can't move it anywhere'" (Karr, 2023).

Due to the high levels of uncertainty involved in the pace of market shifts, the precautionary principle should be strongly considered in the case of Manitoba's commercial fisheries. The precautionary principle, commonly used in the field of sustainable development, states that in

cases having high levels of uncertainty regarding outcomes, it is best to act in a manner that aligns with the worst of the possible outcomes. In the case of Manitoba's commercial fishing industry, this would mean behaving as if there is a relatively short amount of time left before the industry starts losing significant marketing opportunities due to not having enough eco-certified fish. It is clear right now that the international markets are indeed shifting more and more in favour of eco-certified fish, as can be seen with examples like Walmart, Sam's Club, and BOFROST. The uncertainty revolves around how long it will take before it becomes exceptionally difficult to sell non-certified fish. In the worst-case scenario, should the tipping point come soon, Manitoba's commercial fisheries will want to be prepared for the sudden shift by having become eco-certified early enough. In the best-case scenario, if the market tipping point turns out to be further away, they will simply have gotten ahead of the market trends by becoming world leaders in the supply of eco-certified freshwater fish and thereby avoiding a future loss.

Nearly all stakeholders and rights holders interviewed over the course of this research, including those in government, marketers, and the fishers themselves, identified that European markets, which are a primary market for Manitoban fish (Appendix A) are shifting toward a point where they will not buy non-certified fish (Hayne, 2023; Karr, 2023; Kitch, 2023; Klein, 2023; Mackay, 2023; Moneyas, 2023). In an interview, an American fish buyer of Manitoba lake whitefish anticipated eco-certification would become increasingly important over time and thus that it would be preferable to have all their fish eco-certified, of possible (Tupper, 2023). All stakeholders and rights holders interviewed agreed that the speed at which that point will be reached is highly unpredictable, and that some marketing opportunities have already been lost (Karr, 2023; Kitch, 2023; Klein, 2023; Mackay, 2023; Moneyas, 2023). The primary economic concern in regard to eco-certification is avoiding significant damage to Manitoba's commercial fishing industry. In the case study of Lake Erie, this was also a primary reason for pursuing eco-certification. European markets were starting to demand that their fish be eco-certified, and Lake Erie wanted to stay current with market trends (Graham, 2023). For Manitoba, specifically, we did not find strong evidence that new markets would open up due to eco-certification. Some buyers interviewed clarified that the amount of Manitoba fish they purchase is limited by supply rather than demand (Tupper, 2023). Rather, it is the risk of losing existing markets that is the primary concern. The freshwater species being fished in Manitoba do not compete in the market only with the same species but also sometimes with marine fish that have similar culinary qualities. For example, walleye competes with species like cod and halibut. So, even if there are no other available sources of eco-certified walleye or lake whitefish, buyers could still opt for eco-certified marine fish. This is an important factor in understanding why lost markets are a concern, despite a very low quantity of other freshwater eco-certified fish being available.

Recently, the majority of Manitoba's major commercial fisheries have expressed interest in eco-certification; however, only two of these (Osh-koo-na-ning and Cedar Lake) have achieved it (Klein, 2023). Successful certification by the remaining interested larger fisheries could allow Manitoba to meet the increased demand for eco-certified freshwater fish in the international markets. The significance of this is that globally, there are very few sources of eco-certified freshwater fish from any verified eco-certification label (including labels other than MSC),

particularly when compared with eco-certified marine fisheries. This means that worldwide, freshwater fish that is certified sustainable is a limited resource and Manitoba could position itself to be a major player in that market. In fact, based on the last 10-year average, if all interested fisheries achieved eco-certification, this would translate into a supply of 330,000 kg of walleye and over 1 million kg of all-species certified fish each year (Galbraith, 2020).

Opportunities for Brand Building

For fisheries that become early leaders in eco-certification, there is the benefit of their certification being novel and newsworthy because they have accomplished something rather unique. For example, when Osh-koo-na-ning became the first MSC eco-certified freshwater fishery in the Western hemisphere, this generated news headlines from multiple media outlets, including some that were international ("Manitoba fishery earns," 2014; SeafoodSource, 2014; Water Canada, 2014). In a similar instance, when Cedar Lake fishery became MSC-certified in 2022, the timing coincided with the launch of Fish Forward, which allowed Cedar Lake to benefit from additional press opportunities (Lamont, 2022). In one of our expert stakeholder interviews, it was found that after Cedar Lake's eco-certification was announced very publicly, they received phone calls from interested buyers who heard about them from the press coverage around the Fish Forward launch (Kitch, 2023): "A lot of the news feeds and social media feeds have reached all corners of the planet and it's really put Cedar Lake on the map. So, at some point I think they're gonna definitely reap the rewards of increased market demand and ultimately, we're hoping to see increase in their price of their product as well" (Kitch, 2023). The benefit of increased media coverage was also experienced by the Lake Erie walleye fishery in Ontario. The largest benefit experienced by Lake Erie as identified by stakeholders since becoming eco-certified is the branding opportunities that come along with being certified as sustainable (Graham, 2023). "It makes a good news story," as our expert stakeholder interviewee put it (Graham, 2023).

3.2 Costs of Pursuing Eco-Certification for Manitoba's Non-Certified Fisheries

Monetary Cost

The primary cost to consider in pursuing eco-certification is the monetary cost. The financial burden on a fishery pursuing eco-certification is significant and represents the biggest reason why Manitoba's fisheries have been unable to certify without government support (Mackay, 2023; Moneyas, 2023). The exact cost of certification can vary substantially from case to case because it depends on the size and specifications of the lake, the nature of the recommendations, and how much the third-party certifier charges for their services. Manitoba's fisheries vary substantially in size and number of fish stocks, so the cost should be anticipated as much larger for Lake Winnipeg than Cedar Lake, for example. The costs of eco-certification can be broken down into four timelines that each have their own associated costs: pre-certification, FIP (if required), full certification, and maintaining certification. For smaller lakes, the cost of the FIP and full

assessment would sit in the range of $80,000–$90,000 (E. Dunbar, personal communication, December 14, 2023). In addition, there are costs associated with pre-certification in the range of $30,000–$40,000 plus the follow-up costs of annual audits, which would cost roughly $30,000 for Cedar Lake (E. Dunbar, personal communication, December 14, 2023). For the larger lakes in the province, the costs would be higher, with the full assessment and FIP costing at least $250,000 and likely higher (D. Kroeker, personal communication, December 14, 2023). For northern Indigenous fishers who already struggle to make ends meet, this is a cost that cannot be directly shouldered (E. Dunbar, personal communication, December 14, 2023). In the case of Lake Erie, the monetary cost was less of a setback than for Manitoba's lakes because the fishery was able to self-fund the project (Graham, 2023).

Time Commitments

Eco-certification also takes time. The full process for a fishery to become eco-certified ranges from 12–18 months, excluding the process of pre-assessment and FIP (MSC, 2023). The length of pre-assessment can vary depending on the fishery and the extent of the changes that need to be made, but for Manitoba's already-certified lakes, the timeframe was between 6 and 18 months (W. Galbraith, personal communication, January 4, 2023). The time commitment represents a cost for the commercial fishers, fish buyers, the certifying body, and government departments involved. In the case of Lake Erie, where monetary cost was not a major setback, the largest setback in obtaining eco-certification was the time involved. The full process took longer and had more steps than initially anticipated by those working in the fishery, but according to interviews with expert stakeholders, this was never a severe enough problem that it caused fishers to reconsider pursuing certification (Graham, 2023).

Data Collection

Another implication to consider in regard to eco-certification is the effort that goes into making the changes required for the fishery to meet and maintain eco-certification standards. Habits are not easy to change. In interviews with fisheries who are currently undergoing the process of eco-certification or who are interested in it, the largest change they would have to adapt to was identified as consistent data collection (Kitch, 2023; Mackay, 2023; Moneyas, 2023). In Traditional Indigenous Knowledge systems, the methods used for determining whether fishing is being done sustainably do not involve the Western style of scientific data collection (Moneyas, 2023). These are the methods that have been used for hundreds of years by the Indigenous fishers on Manitoba's lakes, but they are not recognized by modern Western sustainability organizations and are thus not accepted for use in eco-labelling (Mackay, 2023; Moneyas, 2023). This is an important point considering 85% of Manitoba's commercial fishers are Indigenous (Galbraith, 2020). The issue of data collection, while significant in Manitoba, was not a problem during the certification of Lake Erie. An advantage that Lake Erie's walleye fishery had in the certification process, which does not apply to Manitoba's lakes, is that because they are managed across international boundaries, highly detailed data was already being collected on all major fronts in

sustainability (Graham, 2023). This meant that when eco-certification began, they did not have to undergo the sudden adjustment to collecting large amounts of data like Manitoba's fisheries have because this was already being done for years prior (Graham, 2023).

3.3 A Cost-Benefit Analysis of Pursuing Eco-Certification for Manitoba's Non-Certified Fisheries

The benefits of eco-certification for Manitoba fisheries will be the ability to maintain current markets and continue to generate revenue from the catch, which provides both income to fishers and tax revenue to the government. We did not find evidence of a price premium for eco-certified fish from Manitoba fisheries at the time of this research, so **the market price for each fish species is not necessarily expected to increase** after eco-certification. Considering the average costs of eco-certification, we can compare the costs and benefits to evaluate the return on investment for eco-certification.

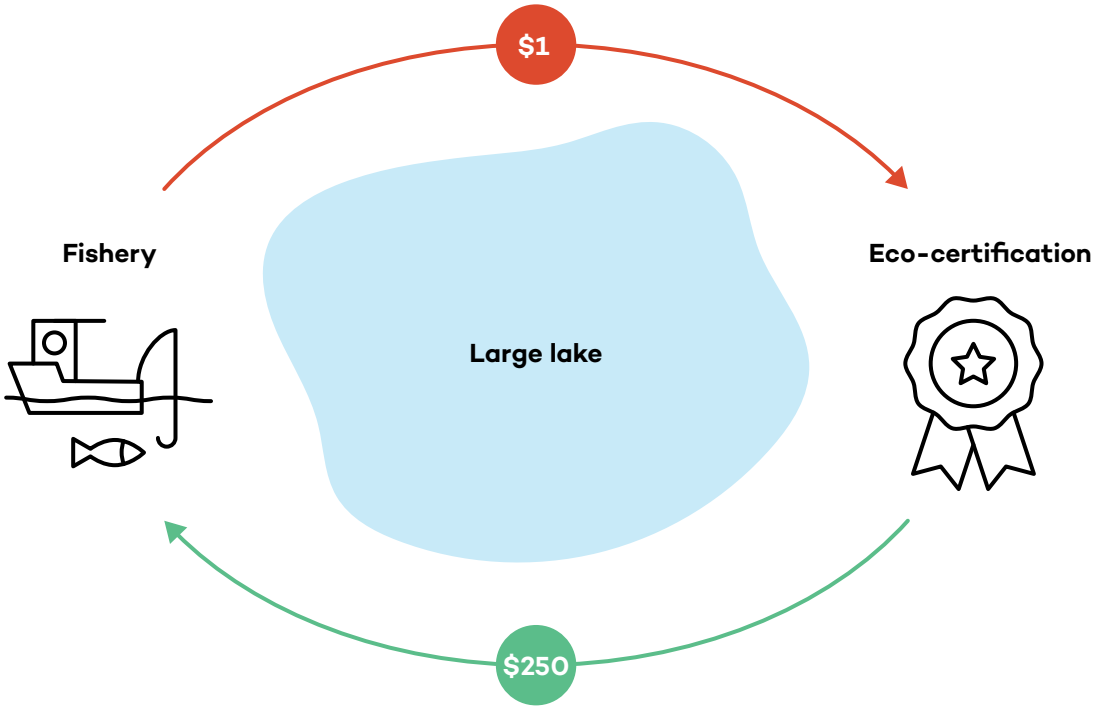
> The market benefit associated with eco-certification for Manitoba's commercial fisheries is the avoided loss of market opportunities that currently exist and the ability to continue to generate revenue from the catch, which provides both income to fisheries and tax revenue to the government.

We will compare the costs and benefits over the 5 years following the eco-certification for large and small lakes in Manitoba, to demonstrate the potential magnitude of economic benefits in relation to costs and evaluate the return on investment.

The costs comprise the pre-certification cost which may occur over the course of a few years preceding the awarding of the eco-certified status, the cost of full certification, and the costs of annual auditing once the fishery becomes eco-certified. The benefits are the revenues that were maintained after the eco-certification is awarded to the fisheries.

Larger Lakes – Cost and benefit comparison

Figure 3. The return on investment for eco-certification of large lakes



Source: Author.

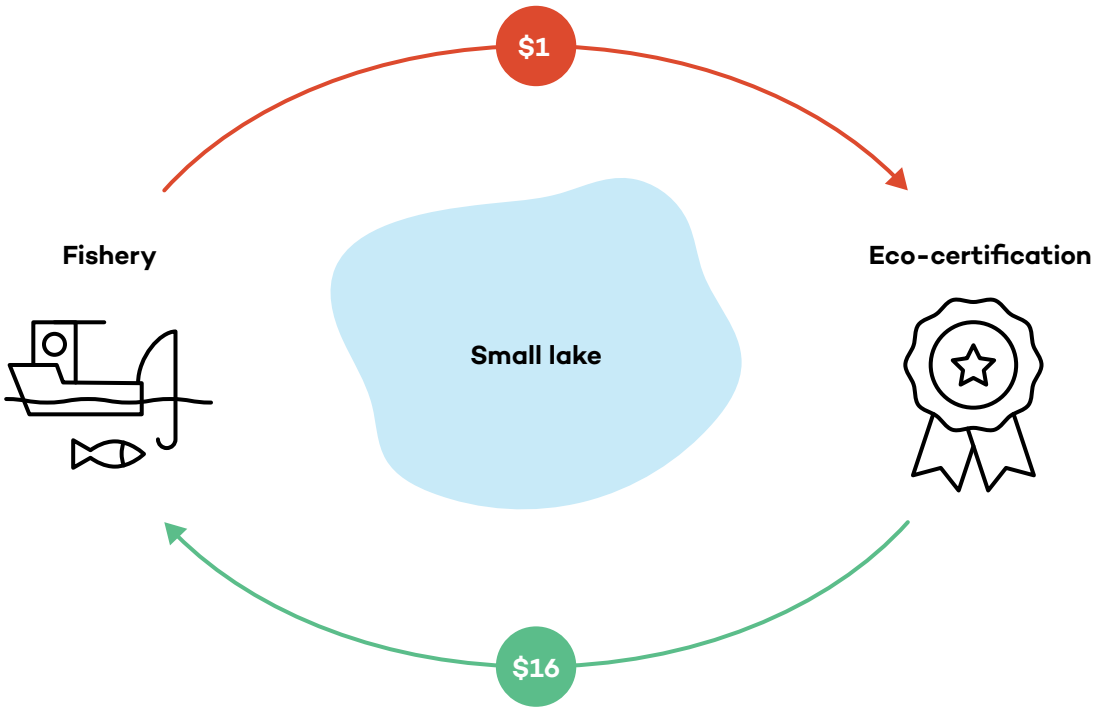
For Lake Winnipeg, the species that are being considered for eco-certification are walleye and lake whitefish. Walleye generates an estimated $16,773,105.80 in market value annually, and for lake whitefish the estimated market value generated annually is $5,798,096.51. This means that over a 5-year period, these two species generate $112.8 million.

By comparison, the cost of eco-certification for Lake Winnipeg for these two species is estimated at $250,000 for full certification, $30,000–$40,000 for pre-certification, and then an additional $30,000 each year for annual auditing (E. Dunbar, personal communication, Dec. 14, 2023). This brings the total cost of eco-certification for the lake to roughly $450,000 over the course of at least 5 years.

This results in about $250 of benefits per $1 invested over 5 years once the certification is awarded.

Smaller Lakes – Cost and benefit comparison

Figure 4. The return on investment for eco-certification of small lakes



Source: Author.

For Manitoba's smaller lakes, the costs and market revenues differ from those of the larger lakes. For a lake of similar size to Cedar Lake, the cost of the full eco-certification would be in the range of $80,000–$90,000. The cost of pre-certification would be roughly $10,000, and then every year for the 5-year certification period, the annual audit would cost an additional $30,000. This would bring the total cost of the process for a 5-year certification to $250,000.

If we use Cedar Lake as an example of what revenues would look like for a lake of this size and only consider walleye and northern pike for revenue estimates[5] (these are the only two certified species on Cedar Lake), the annual market revenue for northern pike would be $135,713.80 and $695,778.00 for walleye. So, the total annual market revenue for the certified species would be $831,491.80, or $4.16 million over the 5-year certification period.

This results in about $16 of benefits per $1 invested over 5 years once the certification is awarded. As can be seen from the results above, the return for eco-certification is higher for larger fisheries.

[5] Please note that the estimates for market revenue generated reflect market prices for the industry as of 2023, not income to fishers. Prices are estimates obtained from K. Casper (personal communication, December 18, 2023), and methods are outlined in Appendix B. Costs of eco-certification are estimates obtained from Dunbar and Kroeker in 2023.

4.0 Additional Benefits of Eco-Certification

Key Point Summary

- Global case studies from fisheries in the United States and Europe demonstrate several commonly experienced socio-economic co-benefits to eco-certification, including improved image, improved fishing practices, reduced rule breaking, and increased trust and cooperation among industry players.
- The certified case study fisheries in Manitoba have benefited from improved public image since certification, and, in the case of Osh-koo-na-ning, some additional benefits have been experienced internal to the fishery as well.
- Implementation of sustainable fishing policies in the lead-up to eco-certification led to improved health and stability of fish stocks in Manitoba in the case study fisheries identified.

4.1 Socio-Economic Co-Benefits

Globally Observed Co-Benefits of Eco-Certification

At the time of this research, the Lake Erie fishery is the only eco-certified freshwater fishery comparable in many respects to the Manitoba fisheries. The total number of eco-certified freshwater commercial fisheries is limited globally. On the other hand, there are many marine eco-certified fisheries that are comparable to Manitoba's commercial fisheries from a socio-political standpoint. For the analysis of non-ecological co-benefits, it can thus be useful to draw on literature related to marine eco-certified fisheries in jurisdictions with comparable socio-political conditions.

A body of academic literature exploring the socio-economic benefits of eco-certification for fisheries has developed over the last 15 years, some of which focuses on North America and Europe (Anderson et al., 2021; Longo et al., 2021; Wakamatsu, 2014). In a study examining social change in eco-certified fisheries in North America and Europe, it was found that the socio-economic co-benefits of eco-certification are dependent on the surrounding market environment in the market where the fishery operates (Anderson et al., 2021). For example, in Western Europe, where eco-certified value chains are being widely developed, eco-certified fisheries in that market tend to see greater economic benefits (Anderson et al., 2021). As in Manitoba, the primary market benefits sought through eco-certification in European and American fisheries are to gain additional and maintain existing marketing opportunities (Anderson et al., 2021). The most commonly observed co-benefits are improved image, improved fishing practices, increased trust and cooperation between industry and managers, and increased collaboration among harvesters (Anderson et al., 2021). However, the extent to

which specific co-benefits are experienced can differ depending on whether the certified fishery is a "pioneer" in eco-certification in their market or joining the bandwagon later (Anderson et al., 2021). For example, a fishery that is the first in its market to become eco-certified would benefit from the public image of being a pioneer in the industry, while this would be less the case for a fishery becoming eco-certified after most other fisheries in their market have already done so. In Anderson et al.'s study, this type of pattern was also observed for the primary market benefits (Anderson et al., 2021). Early movers were more likely to become eco-certified for the benefit of increasing profits and market shares, while later movers were more focused on trying to keep up with the industry and simply avoid loss (Anderson et al., 2021). This could be an important takeaway for Manitoba's fishing industry—that the greatest benefits of becoming eco-certified may come to those fisheries that are the "pioneers." Other international research has also found that some of these co-benefits may hold a causal relationship with primary market benefits (Wakamatsu, 2014). Such was the case in the Japanese Kyoto Danish Seine Fishery Federation, where after receiving positive public attention in the months following eco-certification, the fishery experienced market benefits (Wakamatsu, 2014).

Another co-benefit of eco-certification that has been observed internationally is a reduction in illegal activity and rule breaking in the fishery (Longo et al., 2021). An example of this comes from the Western Austria octopus fishery, where prior to certification there was an issue of some fishers placing more traps than were allowed and then failing to report these extra traps (Longo et al., 2021). As part of the certification process, it was agreed that to maintain certification, all gear from their fishing vessels would have to be marked and that all vessels would be tracked by satellite to make monitoring for compliance easier (Longo et al., 2021). If any fishers were found to be violating this agreement, the certification would be revoked, causing the loss of all market benefits associated with eco-certification. Since certification, all vessels in this fishery have been found to be marked and compliant (Longo et al., 2021). This case study provides an example of how the additional market-related incentives associated with eco-certification can help improve compliance with regulations. It may also be the case that eco-certification creates social pressure among fishers to be compliant with regulations because one rule breaker has the potential to ruin it for the whole group (Longo et al., 2021). Rather than each individual rule breaker facing consequences for their own actions, their actions stand to create negative consequences for their entire fishing community.

There are also potential economic benefits to achieving eco-certification that are not directly related to marketing opportunities. For example, maintaining a sustainable, certified fishery can reduce the risk of diminished harvest levels, which in turn further protects employment opportunities for fishers and can potentially stabilize revenue at the local level (Gutiérrez et al., 2012). Another benefit can be greater food security and access by non-commercial stakeholders, like subsistence fishers, because of the sustainable allocation and management of the fishery's resources (Islam & Berkes, 2016). These benefits should be considered as well as direct marketing and revenue benefits because of their potential positive impact on the long-term sustainability of the fishery.

Early Observed Socio-Economic Co-Benefits of Eco-Certification in Manitoba

In Osh-koo-na-ning, there have been additional socio-economic co-benefits to the community beyond marketing. One year after Osh-koo-na-ning achieved eco-certification, the fishery was able to re-open their fish shed, which had been closed for over 10 years prior to eco-certification (MSC, 2017). This allowed certified fish to be properly separated from non-certified fish from nearby lakes and led to several socio-economic co-benefits, like new job opportunities for the local community (MSC, 2017). The re-opening of the fish shed had benefits to fishers, as well, such as cutting the transport distance required for selling by over half (MSC, 2017). The decreased travel distance, in turn, saved time and travel costs for the fishers (MSC, 2017).

Becoming eco-certified has also come with reputational benefits for those fisheries that are certified. For example, in 2015, when SeafoodWatch publicly called for consumers to avoid purchasing fish from most of Manitoba's large fisheries, Osh-koo-na-ning was exempt from this negative publicity due to their MSC certification status (Rutgers, 2022). Osh-koo-na-ning has also benefited from positive public perception, which has instilled a sense of community pride (Rutgers, 2022). As fisher Lorne Hutala says, "We're extremely proud of our certification. If we didn't make sure we're fishing sustainably would there be jobs for our grandkids 100 years from now?" (MSC, 2017).

In the case of Cedar Lake, the eco-certification is very recent, so it is still too soon for the community to see major social benefits, especially since the fishery went through other major changes within just a few years of eco-certification (G. Gillies, personal communication, September 28, 2023). The largest of these changes was the shift toward the open market for fish and Cedar Lake's partnering with Presteve Foods, which was seen as very positive for the community (G. Gillies, personal communication, September 28, 2023). However, the community has started to see some early positive changes that can be directly linked to eco-certification. One is that because of their eco-certification, the Cedar Like fishery gained the ability to sell their offal (which had previously been discarded) to an American pet food company, thus gaining revenues from a previously unprofitable product (E. Dunbar, personal communication, June 17, 2024). The case of Cedar Lake in Manitoba provides parallel reports from the fisheries in Anderson et al.'s study. In this study, the majority of the fisheries also underwent some form of market restructuring in the years leading up to eco-certification (Anderson et al., 2021). This additional change made it difficult to discern whether a fishery's subsequent increase in revenues could be attributed to eco-certification (Anderson et al., 2021). Future monitoring and analysis will be useful to determine which economic outcomes result from different changes that occur at a similar time, or in the years leading up to a fishery becoming eco-certified.

Another, perhaps less frequently recognized, benefit is the increase in collaborative management between fisheries and government in the fisheries that have achieved eco-certification. This phenomenon is widely observed in fisheries undergoing eco-certification and will be further

explored in the subsequent section: How Eco-Certification Relates to Ecologically Sustainable Management.

Truth and Reconciliation and the 94 Calls to Action

A potential benefit of pursuing eco-certification is that it has a track record of getting positive public attention for Indigenous-owned businesses (see "Opportunities for Brand Building" above). This is of interest to Manitoba as it relates to the Federal 94 Calls to Action for Truth and Reconciliation (Crown-Indigenous Relations and Northern Affairs Canada, 2023). Calls 84–86 focus on increasing positive media representation for Indigenous Peoples (Crown-Indigenous Relations and Northern Affairs Canada, 2023). While the exact wording of these Calls to Action is focused more on the federal government, the provinces can still support the spirit of these Calls to Action by positively contributing to and supporting positive media attention for Indigenous communities and businesses. From the perspective of the federal government, continuing to invest in Indigenous-led fisheries, as has been done through the Strategic Partnerships Initiative funding of IICFI, also contributes toward truth and reconciliation.

The eco-certification of Manitoba's commercial fisheries represents an opportunity for the provincial government to engage meaningfully and respectfully with Indigenous Knowledge systems. This, however, is not a given and can only be achieved if deliberate steps are taken by all involved in the course of eco-certification efforts to have the utmost respect for Indigenous Knowledge and culture. Historically as well as today, there have been countless instances where trust has been breached between the provincial and federal governments and Indigenous communities. All of these instances, over time, have resulted in a broken relationship in which Indigenous rights have consistently been undermined. Any chance that the provincial government has to work in genuine partnership with Indigenous leadership and businesses can be seen as an opportunity to begin acting in a better way. Eco-certification, if tackled correctly, could be an opportunity for the province to further the process of reconciliation and start to build more positive relationships, built on trust, respect, and Indigenous self-determination. This report will not make further recommendations on how such steps could be taken because only Indigenous Nations can best determine how this process should look. Indigenous Nations will need to be the leaders and decision-makers on how this process of reconciliation is best begun.

4.2 Ecological Benefits

For ecological indicators related to eco-certification and changes in fishery health, certification provides market signals that trigger management changes that have sustainability impacts (Martin et al., 2012). These changes and impacts typically happen prior to the achievement of the eco-certification label. So, the comparison that needs to be made to measure ecological progress is not *pre-* versus *post-certification* but *pre-* versus *post-specific change in practice*, whether it be related to an FIP, collaborative stock monitoring, or directly to eco-certification. Manitoba's fishing industry has come under significant criticism for unsustainable management

of the freshwater fisheries, particularly on Lake Winnipeg (Crabb, 2015; "Lake Winnipeg fish species," 2018; "Province orders fisheries review," 2015). The fundamental underlying issue behind the criticism is that Manitoba's fisheries are being managed reactively rather than proactively (e.g., not enough data being collected continuously, poor reporting, etc.) (Crabb, 2015). Therefore, there are three questions to address from an ecological sustainability standpoint: 1) Are changes in fishing policy in Manitoba making a difference to stock health? 2) Are ecological sustainability concerns being addressed proactively or reactively? and 3) How does eco-certification affect the previous two points?

Changes in Stock Health Due to Changes in Policy

One of the certified case studies selected for Manitoba is Cedar Lake, which provides a relevant example of how stock health reflects policy. The health of the Cedar Lake fishery has gone through ups and downs over time, and regulations have changed in response to these fluctuations. In the early 1990s, Cedar Lake's walleye stock collapsed, prompting the fishery to close from 1998 to 2002 (Klein et al., 2020). After 2002, the fishery was reinstated and has not collapsed since with the help of a combination of regulations ensuring sustainability (Klein et al., 2020).

When the fishery re-opened, the number of quota holders on Cedar Lake was reduced to 41, or half of the previous value, and the fishery began closing for the month of May to protect the spawning aggregation of key species (Klein et al., 2020). Changes were also made to net regulations, with the minimum mesh size being set to 108 mm and the maximum yardage being capped at 1,400 m at any given time (Klein et al., 2020). These regulations have not been static since but have changed over the years in response to changing conditions and ideas. For example, in 2017, the fishers of Napanee Bay in the Cedar Lake fishery agreed to a reduced base quota along with new rules for how the quota would be allowed to change in response to annual mortality and relative weight (Klein et al., 2020). These new rules were designed to be conservative relative to maximum sustainable yield (maximum sustainable yield is estimated to sit at 42% annual mortality, so a trigger value of 40% was set for quotas to be reduced) (Klein et al., 2020). The collective impact of the sustainability changes in Cedar Lake can be seen in the increasing stabilization of the data trends over the last 20 years since the fishery re-opened (Klein et al., 2020). The fluctuation in deliveries of all major target species has become smaller over each 5-year period since the re-opening of the fishery, with the walleye harvest settling to just below the estimated value of maximum sustainable yield (183,000 kg) (Klein et al., 2020). By 2022, the Cedar Lake fishery was sustainable enough to gain MSC eco-certification.

The other selected certified case study in Manitoba is Osh-koo-na-ning, where reflections from policy changes over the years can also be seen in the health of the stocks. Prior to 1972, there was no minimum allowable mesh size in place and the deliveries of walleye from Osh-koo-na-ning varied dramatically (Klein & Galbraith, 2017). Then, in 1972, a minimum allowable mesh size of 102 mm was implemented, which caused the stock to achieve relative stability until the early 1990s, when the minimum mesh size was brought down to 76 mm, causing a stock collapse (Klein & Galbraith, 2017). In response to this collapse, more sustainable policies were introduced

that more closely aligned with the ecological realities of the species being fished. The minimum mesh size was increased to 96 mm, which selects against pre-spawning-age fish and takes into account differences in growth patterns between males and females (Klein & Galbraith, 2017). Rules were put into place specifying that if various biological indicators, such as spawning stock biomass, fell below levels deemed sustainable, this mesh size would change accordingly (Klein & Galbraith, 2017). A quota was also introduced of 36 tons (Klein & Galbraith, 2017). Under these new changes, the stocks recovered so well that not only did the stocks stabilize, but the fishery became eligible for MSC eco-certification in just 10 years. This provides another example of how the health of fish stocks responds to the types of sustainable policy changes required for eco-certification.

Reactive vs. Proactive Management

The case study fisheries discussed so far provide evidence that sustainability improves through policy change. But something of note in both case studies is that initially, sustainability changes were made in response to severe cases of non-sustainability (like fishery collapse). There was then a shift over the years leading up to eco-certification toward proactive management. The issue of reactive management has historically been a pattern for Manitoba's fishing industry and is at the heart of the criticism from environmental organizations ("Lake Winnipeg fish species," 2018). The argument is that a fishery cannot be considered ecologically sustainable unless adaptive management is taking place to prevent poor health of the fish stocks from occurring before it happens. While it is great to see recovery after damage to a fish stock, it does not change the fact that damage took place. An example of proactive management in the case studies could be the Cedar Lake fishers proactively setting rules for how their quota would change in response to ecological indicators (annual mortality and relative weight). This can be contrasted with their reactive management two decades prior—when the fishery was temporarily closed in response to a stock collapse. It is these types of management decisions that separate a truly sustainable fishery from its less-than-sustainable counterparts.

How Eco-Certification Relates to Ecologically Sustainable Management

Eco-certification provides a structure for fisheries to work within to maintain sustainability. It provides clear deadlines for when assessments need to take place and documented next steps for changes needed to maintain "Sustainability" status. When this framework is followed, the fishery benefits by maintaining access to their markets and, in some cases, potentially gaining access to new markets. There is also literature to suggest that participation in eco-certification increases the desire of fishers to follow sustainability regulations because even one rule-breaking fisher has the potential to lose certification status on behalf of the entire group (Longo et al., 2021). In the academic literature, it has also been found that once one fishery in a geographic region achieves certification, this puts pressure on other nearby fisheries to do the same for fear of getting left behind the market trends (Anderson et al., 2021). The implication of this is that once some

fisheries in the province achieve eco-certification, this could produce an urgency effect for other fisheries to become as sustainable as possible as soon as possible, which would bode well for ecological sustainability province wide.

We have now established two things: that ecologically targeted fishing policy can result in more sustainable fisheries and that proactive sustainable management is preferable to reactive management. Eco-certification provides a validated, systematic pathway to putting in place targeted policies aimed at overall sustainability in the same way that proactive policies were put in place at Cedar Lake and Osh-koo-na-ning. The presence of eco-certification can create incentives for fishers to adopt sustainable practices that improve the ecological sustainability of the fishery, providing fishers with long-term livelihoods with an internationally verified and recognized process. This, in turn, provides certified fishers access to markets that prioritize and value such practices. It also serves as a standard process that puts regulators, fishers, markets and other stakeholders in well-understood positions that may create more trust and transparency between regulators and fishers. Conversely, in the absence of an eco-certification system, the onus of maintaining fisheries in a sustainable way falls squarely on government regulators and may have negative consequences such as draining government resources and developing antagonistic relations between fishers and government with no resulting market benefits.

5.0 Conclusion and Recommendations

5.1 The Ideal Form

The ancient Greek philosopher Plato believed that all things on Earth are created in the image of an ideal form of that thing and that all things strive to achieve their ideal form. An apple, for example, is created in the image of an imagined "ideal" apple, and it is the goal of that apple to become as close to that ideal form as possible. While this idea certainly does not apply to material objects in the way that Plato believed, it can be a useful framework for policy.

In the case of policy, the "ideal form" would represent what policy would look like in a perfect world with no limitations on resources. In other words, what would be a perfect scenario? It then becomes the goal to make real policy as close as possible to the ideal form as possible under real-world circumstances. The ideal form, while understood to be unachievable in real life, serves as a framework to measure how closely real-life policy is reaching the desired outcome. Recommendations will thus be structured as answers to these questions: 1) What would the ideal form of eco-certification policy look like for Manitoba's commercial fisheries? and 2) What realistic steps can be taken to get as close to that form as possible under real-life circumstances (concrete recommendations)?

5.2 The Ideal Form of Government Support for Eco-Certification of Manitoba's Commercial Fisheries

A key insight gained from this research is that there are four main ingredients in the successful eco-certification of a Manitoba commercial fishery: interest from fishers, availability of funding, availability of government staff time, and positive personal relationships. An ideal form would mean having all four ingredients available in ample supply. This would mean sufficient funds are made available to cover the cost of eco-certification for all freshwater fisheries in Manitoba as well as of the monitoring and evaluation that must continuously take place. Additional government staff are hired to respond to the needs of all fisheries in the process of eco-certification at all times. Training in data collection is provided to all fishers involved so that they can accurately report on indicators in real time. Time is invested in building positive relationships between government staff, fishers, and other stakeholders. All of Manitoba's commercial fisheries become eco-certified in the shortest timeline possible, and no market opportunities are lost in the process.

Recommendations for Eco-Certification of Manitoba's Commercial Fisheries

The following recommendations are provided to maximize the sustainability of Manitoba's fisheries through eco-certification. They are listed in order from what would be the most significant step to what would constitute smaller steps toward the ideal scenario.

1. Government should prioritize funding to the greatest extent possible for fisheries trying to become certified.

In interviews with fishery representatives, the monetary cost of pursuing certification was named as the number one factor preventing interested fisheries from certifying. In our out-of-province case study, Lake Erie, the fact that the fishery had the financial ability to self-fund their certification was a huge driving factor in their achieving MSC eco-certification. It is clear that with financial resources made available, Manitoba could speed up the eco-certification process of the commercial fishing sector. Securing funding is always a challenge, and it will likely be impossible to fully fund eco-certification for all fisheries in the short term, but the goal should be to get as close as possible to the 'ideal form' in which funding is fully available. The province has already begun taking action toward this item by making funds available for fisheries' eco-certification in the past 2 years. Access to these funds should be highlighted and simplified where possible as a priority toward increasing eco-certified fisheries in Manitoba.

2. The provincial government should hire more branch staff who can work with fisheries through pre-certification and certification while also allocating sufficient funds to support those staff in long-term data collection.

At the time of this writing, there are a small number of highly dedicated government staff who are working with a large number of fishing communities through the eco-certification process. They are also still responsible for the rest of their workload at the same time and sometimes lack resources to complete important tasks like supporting data collection. Given the high dependency on government staff efforts for Manitoba's fisheries to eco-certify, having more staff or consultants available to do this work as well as the resources they need to do it would speed up the process of certifying interested fisheries.

3. All parties involved should continue investing time in strong personal relationships between fishers, other industry players, government, and those involved in certification.

The process of stakeholder interviews revealed that positive personal relationships between government staff and fishers were a make-or-break factor in the eco-certification and pre-certification processes.

4. Indigenous Knowledge systems and ways of life must be respected at all times by all involved (both government and industry), even when Western-style data is required for the eco-certification process.

The majority of Manitoba's commercial fisheries are Indigenous run, and Indigenous Peoples have been fishing sustainably on this land since time immemorial. As a result, extensive Traditional Knowledge systems have been developed that are different from Western scientific knowledge. The eco-certification process inherently involves Western scientific methods of data collection and monitoring, and there is no avoiding this. However, it is crucial that all government staff involved are equipped with the understanding that Western knowledge systems

are not superior to Indigenous Knowledge systems, just different. It may be the case that certain processes depend upon scientific data collection, but this does not make it acceptable to treat Indigenous ways of knowing as "less than" or unreliable compared with Western scientific methods. They are simply different and are applied in different contexts.

5. Build awareness of how eco-certification works, making relevant and detailed information as accessible as possible to fishers.

Many fishers are unsure about whether they are interested in pursuing eco-certification, and some of this uncertainty is connected to not having enough detailed information about what the benefits and risks might be. For example, there may be concern that government would have more ability to make sudden changes to fisheries management without proper consultation, even though, in reality, eco-certification works by making fisheries directly accountable to buyers and consumers rather than to government. This is something that would be impossible for a fisher to find out without having easy access to full and transparent information. Without easy access to accurate information about eco-certification, fishers cannot make informed decisions about whether to eco-certify.

6. When resources are too limited to fund full eco-certification, steps should still be taken toward improving sustainability, even if those steps are small.

In interviews with government stakeholders, it was identified that one reason why Manitoba's losses to date due to lack of eco-certification have not been greater is that some threats of lost markets were staved off by actively demonstrating that steps were being taken to improve sustainability (entering into FIPs, etc.). These cases demonstrate that making any progress toward sustainable fisheries management, even small steps, can prevent the loss of marketing opportunities. From an ecological perspective, of course, it is always beneficial to improve the sustainability of commercial fishing, as well.

7. Industry players should take full advantage of the publicity opportunities that come along with eco-certification.

One of the most commonly observed co-benefits of eco-certification is improved public image and media attention. In addition, eco-certified freshwater fisheries are uncommon globally. As more of Manitoba's fisheries become eco-certified, this presents a unique opportunity because Manitoba may, in the near to medium future, find itself home to the greatest density of eco-certified freshwater fisheries in the world. This is an opportunity for marketing that could potentially lead to increased business opportunities for Manitoba and should not be ignored.

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Appendix A. Current Marketing of Manitoba Fish

Breakdown of Catch by Fishery for Whole Province

The primary species being fished in Manitoba are walleye (46%), lake whitefish (19%), northern pike (15%), suckers (12%), and sauger (3%) (Galbraith, 2020). Other species are also being harvested but in smaller quantities, including yellow perch, goldeye, common carp, white bass, cisco, lake trout, freshwater drum, and various suckers (Galbraith, 2020). Walleye is of particularly high value, making up approximately 70% of the average landed value (Galbraith, 2020). Readers should note that while accurate at the time of reporting, these values can fluctuate from year to year. Below is a breakdown of the amounts of each type of fish (units are kg) sold annually by commercial fishery, as set out in the 2022–2023 Annual Report, Harvest Details of the Manitoba Fisheries Branch, Natural Resources and Northern Development (2023). The market value for each species is also provided. This value represents an estimate of the total market value for the amount of fish listed in the previous column for that specific species. These values represent estimates based on the average price in Canadian dollars for each species and weighted for method of delivery (round, headless, etc.) for the 2022–2023 year, as obtained from K. Casper (personal communication, December 18, 2023) through a special data request, for data year 2023. For methodology and calculations, see Appendix B.

Lake Winnipeg (2022–23)

Table A1. Amounts of species commercially harvested on Lake Winnipeg and estimated market value

Species	**Fish harvested** (kgs)	**Estimated market value** ($)
Carp	83,698.41	33,479.36
Cisco	120,134.95	210,236.16
Freshwater drum	95,711.66	43,070.24
Goldeye	41,568.98	Data not available – sold privately
Lake whitefish	1,474,442.20	5,798,096.51
Northern pike	52,200.55	98,058.73
Sauger	13,475.38	44,084.70
Sucker	155,226.06	79,165.29

Species	Fish harvested (kgs)	Estimated market value ($)
Walleye	3,023,815.72	16,773,105.80
Yellow perch	2,834.59	24,944.39
Total	**5,063,108.50**	**23,104,241.20**

Source: K. Casper, personal communication, December 18, 2023; Natural Resources and Northern Development, Manitoba Fisheries Branch, 2023.

Lake Winnipegosis (2022–23)

Table A2. Amounts of species commercially harvested on Lake Winnipegosis and estimated market value

Species	Fish harvested (kgs)	Estimated market value ($)
Carp	15,759.25	6,303.70
Freshwater Drum	2,208.18	993.68
Lake Whitefish	57,923.31	227,777.60
Northern Pike	267,292.10	502,108.20
Sucker	565,697.15	288,352.50
Walleye	229,489.41	1,272,978.00
Yellow Perch	1,384.60	12,184.48
Total	**1,139,454.00**	**2,310,698.00**

Source: K. Casper, personal communication, December 18, 2023; Natural Resources and Northern Development, Manitoba Fisheries Branch, 2023.

Lake Manitoba (2022–23)

Table A3. Amounts of species commercially harvested on Lake Manitoba and estimated market value

Species	Fish harvested (kgs)	Estimated market value ($)
Carp	94,476.40	37,790.56
Cisco	45,394.75	75,468.77
Freshwater drum	1,871.35	842.11

Species	Fish harvested (kgs)	Estimated market value ($)
Lake whitefish	7,770.90	30,558.29
Northern pike	68,581.40	128,830.20
Sauger	97,146.41	317,814.50
Sucker	290,935.55	148,377.10
Walleye	750,913.91	4,165,319.00
Yellow perch	28,994.83	255,154.50
Total	**1,386,085.50**	**5,160,155.00**

Source: K. Casper, personal communication, December 18, 2023; Natural Resources and Northern Development, Manitoba Fisheries Branch, 2023.

Other Waters (2022–2023)

Table A4. Amounts of species commercially harvested on other waters and estimated market value

Species	Fish harvested (kgs)	Estimated market value ($)
Carp	2,065.50	826.20
Cisco	73,329.96	121,911.10
Freshwater drum	56.80	25.56
Lake whitefish	245,752.83	966,398.40
Northern pike	179,265.61	336,750.40
Sauger	1,617.00	5,290.02
Sucker	326,063.64	166,292.50
Trout	26,705.00	Data not available
Walleye	451,574.36	2,504,883.00
Yellow perch	1,077.05	9,478.04
Total	**1,307,507.75**	**4,111,855.00**

Source: K. Casper, personal communication, December 18, 2023; Natural Resources and Northern Development, Manitoba Fisheries Branch, 2023.

Breakdown of Catch by Fishery for Certified and Non-Certified Fisheries, Selected as Case Studies

Two of the selected case study fishing communities—Wanipigow and Negginan—are both part of the larger Lake Winnipeg freshwater fishery, and as such their data is included in the Lake Winnipeg numbers, which are listed above. The numbers given below are specifically for the two fishing communities being profiled but should be interpreted as being part of the numbers given above for Lake Winnipeg. Units are in kg (Source: Jason Grabowski, Freshwater Fish, 2023, special data request, data year: 2019). In the "whole province" snapshot, all smaller lakes have been combined for conciseness, but for the following section, we have teased out the two smaller case study lakes which are eco-certified: Cedar Lake and Osh-koo-na-ning. Units are in kg. The source is the 2022–2023 Annual Report, Harvest Details (Natural Resources and Northern Development, Manitoba Fisheries Branch, 2023). Estimated market values are also provided. These values represent an estimate of the total market value for the amount of fish listed in the previous column for that specific species. They represent estimates based on the average price for each species and weighted for method of delivery (round, headless, etc.) for the 2022–2023 year, as set out by K. Casper (personal communication, December 18, 2023, data year: 2023). For methodology and calculations, see Appendix B.

Negginan (Poplar River) 2022–23

Table A5. Amounts of species commercially harvested by Negginan and estimated market value

Species	**Fish harvested** (kgs)	**Estimated market value** ($)
Lake whitefish	352,482.50	1,386,102.00
Walleye	233,274.90	1,293,976.00
Sauger	2,528.50	8,271.99
Northern pike	4,973.40	9,342.53
Yellow perch	26,483.40	233,053.90
Other	19,509.80	N/A
Total	**639,252.50**	**2,930,746.00**

Source: K. Casper, personal communication, 2023; Natural Resources and Northern Development, Manitoba Fisheries Branch, 2023.

Wanipigow (Hollow Water) 2022–23

Table A6. Amounts of species commercially harvested by Wanipigow and estimated market value

Species	**Fish harvested** (kgs)	**Estimated market value** ($)
Lake whitefish	7,918.00	31,136.74
Walleye	24,816.00	137,654.35
Northern pike	18.00	33.81
Yellow perch	218.00	1,918.40
Other	333.50	N/A
Total	**33,304.00**	**170,743.31**

Source: K. Casper, personal communication, 2023; Natural Resources and Northern Development, Manitoba Fisheries Branch, 2023.

Osh-koo-na-ning 2022–23

Table A7. Amounts of species commercially harvested by Osh-koo-na-ning and estimated market value

Species	**Fish harvested** (kgs)	**Estimated market value** ($)
Carp	2.80	1.12
Cisco	76.20	126.68
Lake whitefish	843.65	3,317.57
Northern pike	3,754.90	7,053.58
Sauger	17.30	56.60
Sucker	8,248.90	4,206.94
Walleye	20,519.80	113,823.30
Yellow perch	3.70	32.56
Total	**33,467.25**	**128,618.40**

Source: K. Casper, personal communication, 2023; Natural Resources and Northern Development, Manitoba Fisheries Branch, 2023.

Cedar Lake

Table A8. Amounts of species commercially harvested on Cedar Lake and estimated market value

Species	**Fish harvested** (kgs)	**Estimated market value** ($)
Cisco	20,550.78	34,165.68
lake whitefish	25,064.60	98,564.03
Northern pike	72,245.85	135,713.80
Sauger	7.10	23.23
Sucker	58,784.85	29,980.27
Walleye	125,433.20	695,778.00
Yellow perch	3.40	29.92
Total	**302,089.78**	**994,254.90**

Source: K. Casper, personal communication, 2023; Natural Resources and Northern Development, Manitoba Fisheries Branch, 2023.

Summary of Primary Markets for Manitoba Fish

80% of Manitoba's commercial catch is being sold to international markets, particularly in Europe and the United States (Galbraith, 2020). Below is a table outlining who the primary markets are for each type of fish being harvested.

Table A9. Primary markets for commercially caught fish species in Manitoba

Type of Fish	**Primary Markets**
Walleye	United States (primarily the midwestern states of Minnesota, North Dakota, Wisconsin, and Illinois) Canada Europe (primarily France, Germany, Poland, and Belgium)
Lake whitefish	Europe (continental grade—primarily Finland, Sweden, Germany) United States (export grade only—the Midwest, New York, California) Canada (primarily local, Ontario)

Type of Fish	Primary Markets
Northern pike	Europe (primarily France, but other markets exist in Germany, Poland, Finland) Asia (primarily China)
Sauger	Canada (primarily local, Ontario) United States (the Midwest)
Yellow perch	Canada (primarily Ontario) United States (Export grade only – the Midwest, New York, California)
Common carp	United States (Eastern seaboard) Middle East (primarily Israel, but other markets exist in Greece)
Suckers (primarily white sucker, longnose sucker, and redhorse)	United States (New York, other markets exist throughout the eastern states)
White bass	Canada (primarily Ontario) United States (Great Lakes states, primarily the Detroit area)
Freshwater drum	Canada (low-end markets) United States (Great Lakes states)
Lake trout	Canada (primarily Ontario) United States (New York, New England)
Goldeye	Canada (local market)
Cisco	Canada (local, Ontario, western provinces) Europe (primarily Finland, Sweden, and Germany) China

Source: Galbraith, 2020.

Appendix B. Methods for Calculating Estimated Market Values for Fish

To calculate estimated market values, two data sets were used. Data was obtained from K. Casper (personal communication, December 18, 2023), through a special data request, for the data year 2023, on the average price for each method of delivery for each species of fish. For example, the average price for round walleye was $3.88/kg, but the average price for walleye fillets was $22.00/kg. The obtained data set also gave percentages for how much of each species was sold in each form. For example, 48% of the total walleye harvest was sold round. The total weight of each species harvested was obtained from the 2022–2023 Annual Report, Harvest Details, from Natural Resources and Northern Development, Manitoba Fisheries Branch (2023). The following equation could then be applied to estimate the market value for the total amount of the species on each lake:

$$value = sum\ (kgs \times \% \times price)_n$$

Value is the total estimated market value.

Kgs is the total weight of fish in kilograms for the specified species for the specified fishery.

% is the weight applied to the total kgs for how much of the total was sold in the specific form (round, headless, etc.)

Price is the price in Canadian dollars (2023) for the specified form sold.

Example: value for walleye = (total kgs × % of walleye sold round × price per kg of round walleye) + (total kgs × % of walleye sold headless × price per kg for headless walleye) + (total kgs × % of walleye sold as fillets × price per kg for walleye fillets)

For some species listed, very small percentages (maximum 5%) of the total sold were unable to be matched to price estimates, and these were excluded from the estimates. For this reason, the values given should be considered conservative estimates. They are also based on average prices and do not reflect variation between different buyers and thus should be interpreted as estimates, not exact values.

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