

Lake Winnipeg South Basin Creel Survey – Winter 2021-22

Introduction

Lake Winnipeg, particularly the south basin, has become increasingly popular with ice anglers in recent decades. It has gained a reputation of offering a world-class Walleye fishery, annually attracting tens of thousands of anglers from all over the province of Manitoba as well as non-resident Canadians and foreign resident anglers. Easily road-accessible and within a one hour drive from Winnipeg, this highly productive fishery lures anglers with the promise of Master Angler sized Walleye. The annual economic spin-offs have been measured in the hundreds of millions of dollars in direct spending by anglers.

In addition to significant angling pressure, Lake Winnipeg supports a sizeable commercial fishery and provides domestic harvest opportunities for several Indigenous communities around the lake. In order to effectively manage the fishery and ensure its long-term sustainability, fisheries managers require a thorough understanding of overall resource use by recreational, commercial, and subsistence fishers. A common approach to assessing resource use by recreational anglers is through the implementation of a creel survey (i.e. recreational angler survey). The report herein provides a summary of results obtained from a creel survey conducted on the south basin of Lake Winnipeg during the 2021-22 ice angling season.

In addition to the 2021-22 creel survey, the south basin of Lake Winnipeg has been the focus of four creel surveys in recent history, including:

1. a joint federal/provincial recall survey in 2010 (recreational harvests were estimated at 198,520 fish of which 123,170 were Walleye),
2. a winter creel survey (roving method) in 2017/18 (136,380 fish of which 130,830 were Walleye),
3. an angler-funded recall survey of catch in 2017 including the Red River below Lockport (estimated 135,800 kgs of Walleye harvested), and
4. a winter creel survey (access-point method) in 2018/19 (143,000 fish of which 135,850 were Walleye; estimated 81,500 fish harvested).

This study would not have been possible without the voluntary participation of thousands of anglers and the hard work of the creel clerks: Kerri Allard, Alex Borecky, Courtney Cielen, Dani Gosselin, Noah Klos, Luke Mason, Ryne Sitar, and Sydney Virkus. The Manitoba Wildlife Federation and the Manitoba Lodges and Outfitters Association administered this study with funding secured through the Fish and Wildlife Enhancement Fund. The provincial Fisheries Branch provided in-kind support and assisted in data compilation and analysis.

Methodologies

A creel survey may be conducted using either of two general methodologies; a roving survey or an access-point survey. In a roving survey, creel clerks travel throughout a study area interviewing anglers while they are actively fishing. This method is more appropriate on small waterbodies with defined survey boundaries. Due to the inherent size of the south basin of Lake Winnipeg, the access-point survey method is more appropriate. In an access-point survey, creel clerks are stationary on the shoreline at a bottleneck location where anglers access the lake en route to their angling location and

depart the lake at the end of their angling day. The access point method maximizes the number of anglers encountered daily. This method is particularly useful as anglers interviewed upon completion of their day of angling are able to provide responses to all survey questions.

Access Point Survey Locations

The design of the 2021-22 winter creel survey generally mirrored that of the 2018-19 survey. The south basin provides anglers with numerous options for access to the lake, both public and private. This posed logistical constraints, as it is not possible to position creel clerks at each of the dozens of potential access points. In an effort to maximize the number of anglers encountered, survey efforts focussed on south basin public access points most commonly used by anglers (Figure 1) including:

- 1) Sandy Bar (Riverton)
- 2) Warner Road
- 3) End of Main (EOM)
- 4) Pruden Creek
- 5) Balsam Harbour

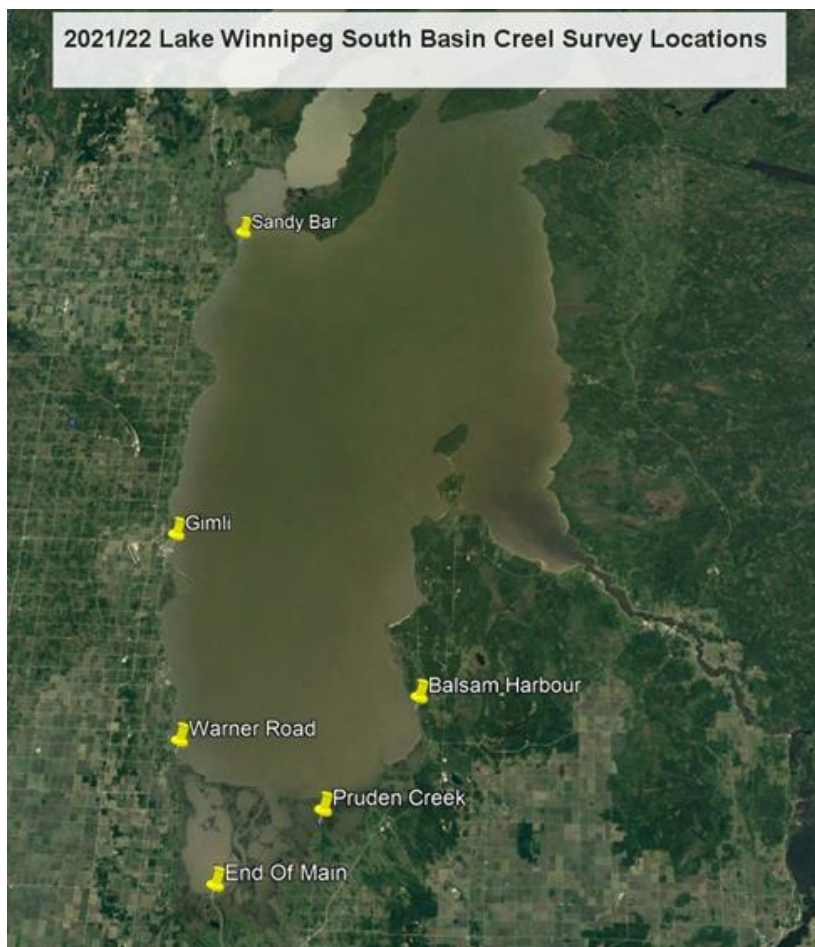


Figure 1: Access Point Creel Survey Locations, winter 2021-22.

Supplemental data was collected from a sixth access point (i.e. Gimli harbour); however, these data are limited and cannot be extrapolated with confidence.

The previous creel survey conducted in the winter of 2018-19 employed two creel clerks rotating among access points throughout the winter. Efforts were intensified for the 2021-22 survey with eight full time creel clerks (four 2-person crews) surveying five days per week. Each crew was assigned a dedicated access point on a daily basis. With additional staff, access points were surveyed more often throughout the winter providing more accurate results for these locations.

Stratification

Recreational angling pressure fluctuates throughout the winter. As expected, the relative number of anglers is typically higher on weekends compared to weekdays. Similarly, angling tends to be more popular in March compared to January as the weather is generally milder and fish become more active in their feeding patterns. As it is not possible to position creel clerks on site 24 hours a day for 7 days a week, data collected on days surveyed are extrapolated to account for days not surveyed.

As the relative number of anglers inherently differs on a daily, weekly and monthly basis, it is not valid to extrapolate angling pressure on a Saturday to that on a Monday for example, nor is it valid to extrapolate from a weekend in late March to a weekend in early January. As a result, raw survey data were stratified by day type (weekday vs weekend), by period (month), and by access location. For example, the month of February, 2022, consisted of 28 potential survey days including 19 weekdays and 9 weekend days. As Monday February 21 was a provincial holiday (i.e. Louis Riel Day), this day was included in the weekend strata. Data collected on weekdays were extrapolated to weekdays not surveyed and data collected on weekend days were extrapolated to weekend days not surveyed. Results were summed to collectively represent a total estimate for the month of February.

Survey Design and Questionnaire

Creel clerks were limited to a 40-hour work week. During January and February when daylight hours are shorter, crews worked a 5-day shift, 8 hours daily. In March, as daylight hours increased, crews worked a 4-day week of 10 hours daily. Due to this constraint, the days selected for surveying as well as the daily timing of surveys were set to maximize the number of anglers interviewed. In general, based on previous surveys, Mondays and Tuesdays saw the lowest number of anglers, thus creel clerks worked 8 hours daily Wednesday through Sunday of each week during January and February. In March and early April through to the close of the angling season, crews worked Thursday through Sunday, 10 hours daily. On occasion, one-person crews were deployed in March to increase survey coverage.

Anglers access the lake at all hours of the day. Morning anglers may arrive as early as 5am while afternoon anglers may not depart until well after sunset. In either situation, creel clerks may not be on location to enumerate and interview these anglers. On a daily basis, crews generally arrived on site late morning, approximately 11am, and surveyed until approximately 1 hour after sunset. The rationale being that by late morning / early afternoon, anglers who arrived early morning prior to creel clerks would begin departing the lake and would be interviewed by the creel clerks at that time. Clerks could then interview the morning anglers regarding their day on the lake thus obtaining a complete record of their angling day. Anglers arriving for the afternoon/evening fish were interviewed by the clerks prior to beginning their daily fish, but may not depart the lake until after the clerks had departed site. In either

situation, it is assumed that all anglers utilizing a particular access point would be intercepted by the clerks at least once, either upon their arrival or on their departure from the lake.

Anglers were posed a series of predetermined questions relating to their angling day (Appendix 1). A survey was determined to be complete if the following information was obtained from an angler / group of anglers:

1. Total number of anglers in the vehicle
2. Angler's place of residence
3. Number of hours spent actively angling today
4. Number of each fish species caught, and of these, the number harvested and the number released
5. The number of Master Angler size fish caught of each species, if any
6. The type of bait used (live minnows, frozen minnows, artificial bait, or any combination).

Anglers departing the lake following their day of fishing were able to answer all pertinent survey questions. However, anglers interviewed upon their arrival to the lake prior to the onset of their day of fishing were only able to answer questions #1 and #2 above. As such, arriving anglers were provided with a creel card (Appendix 2) on which they were asked to document the details of their angling day prior to departing the lake (i.e. provide responses to question #s 3 – 6 above). Completed creel cards were collected in either of two ways. If creel clerks were still on site at day's end, creel cards were simply returned directly to creel clerks. If creel clerks were not on site at day's end, anglers were asked to deposit their completed creel cards into on-site drop boxes.

Car Counters

Electronic vehicle counters (a.k.a. car counters) were deployed adjacent to each access point to enumerate vehicles on a 24/7 basis. Vehicles arriving to and departing from an access point would trigger a count on the device. For each count, a log of the date and time were recorded. Car counters provided critical data on traffic volumes particularly on days when creel clerks were not on site.

In addition to interviewing anglers, creel clerks documented the number of vehicles triggering the car counters but not actively angling that day (e.g. "Sunday drivers", non-anglers on snowmobiles, etc.). By enumerating the number of non-angler vehicles (i.e. false hits), a ratio of angler:non-angler vehicles was obtained. This ratio was used as a correction factor, applied when extrapolating angler estimates on days where creel clerks were not actively conducting a survey.

Survey Design Assumptions and Limitations

Compilation and analysis of access-point creel survey data is subject to a number of assumptions as follows:

1. For each date an access point is actively surveyed, it is assumed that all anglers utilizing the access are enumerated and interviewed (i.e. the number of anglers not surveyed that day is deemed negligible).
2. Questionnaire responses provided by anglers are accurate.

3. For each survey strata, dates and times surveyed and results obtained provide accurate statistics to enable extrapolation to dates not surveyed within a particular stratum.
4. Car counters functioned as intended throughout the course of the survey.
5. A limitation of car counter data is that counters are non-directional (i.e. data do not indicate whether a vehicle is arriving or departing the site). It is assumed that all vehicles accessing the lake at a particular location also depart the lake using the same location. Therefore 50% of the daily total of car counts represents the daily number of vehicles.

Results

Results provided herein represent an extrapolation of access-point creel survey data obtained from five popular Lake Winnipeg south basin locations. Results for two of the five locations, i.e. Pruden Creek and End of Main (EOM), were combined prior to analysis as anglers utilizing either location generally fish the same area of the lake, that being the confluence of the Red River and Lake Winnipeg. Information provided in this report represents a minimum estimate of angler effort, catch and harvest for these locations only and are not indicative of overall angling pressure for Lake Winnipeg's south basin as a whole.

Weather Conditions

In general, the winter of 2021-22 in southern Manitoba saw extended periods of below normal temperatures and above average snowfall accumulation.

Data recorded at the Environment Canada weather station at Gimli Harbour indicates January 2022 experienced a mean daytime high temperature of -14.0°C and a mean overnight low of -23.9°C . February conditions were similar with mean daytime high and low temperatures of -13.9°C and -25.3°C , respectively.

Complimenting this data, creel clerks recorded daily weather conditions on days actively surveyed. At Sandy Bar, a total of 24 days were surveyed during the months of January and February. During these dates, 17 days experienced windchills of -24°C or colder with 10 days at or below -30°C . The month of March typically sees milder temperatures, however the first 2 weeks of March 2022 generally had windchills at or below -24°C .

Angler Activity

Between January 6 and April 3, 2022, creel clerks enumerated 10,195 angler vehicles on the south basin. Of these, 16,837 anglers within 8,683 vehicles voluntarily participated in the creel survey, for an overall angler participation rate of 85%.

Using corrected car counter data, stratified raw data were extrapolated to account for days not surveyed. Extrapolation of raw data estimates a minimum of 25,238 anglers fished Lake Winnipeg during the survey period, accessing the lake via the five monitored locations (Figure 2).

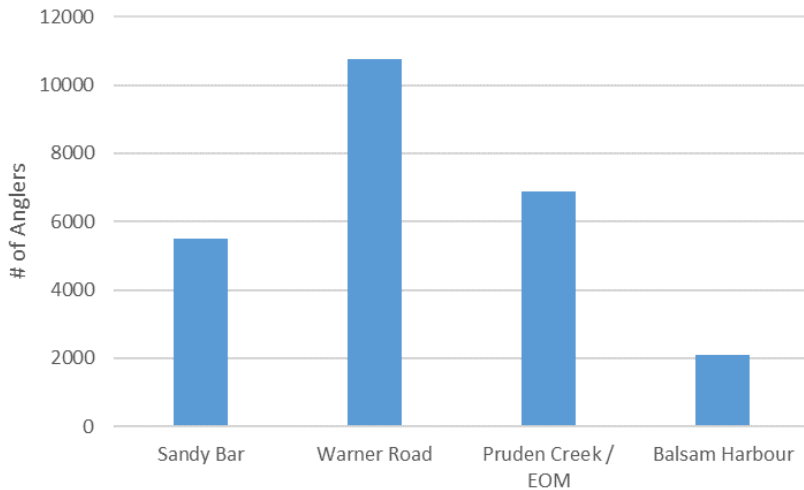


Figure 2: Number of anglers by access location (extrapolated total = 25,238 anglers).

Throughout the survey period, the Warner Road access saw the highest number of anglers. The access at EOM closed to the public on February 21, 2022, due to the onset of ice-cutting on the Red River. The Pruden Creek access was usable up to March 21, 2022, after which time spring thaw on Pruden Creek prohibited travel to the lake. Anglers likely fished the confluence of the Red River and Lake Winnipeg until the close of the season on April 3, 2022 via other routes.

Of note in Figure 2, Balsam Harbour saw low angler use. Under average winter conditions, Balsam Harbour is typically a popular destination for Lake Winnipeg ice anglers, somewhat comparable to Warner Road on the west side. During the early winter of 2021/22, at the initial onset of ice formation on the south basin, prolonged westerly winds set the stage for unfavourable ice conditions along the eastern side of the lake. Frazil / jagged ice along the east side of the south basin made early season travel off Balsam Harbour and other nearby access areas impossible. Travel conditions did not improve until February when sufficient snowfall packed over the jagged ice.

Although above average snowfall improved on-ice travel along the eastern side of the lake, access from Balsam Harbour was limited for most of the winter due to deep drifting snow. As a result, the winter of 2021/22 saw very limited use of Balsam Harbour by anglers. The resultant creel survey data is not indicative of a typical year at Balsam Harbour and should be interpreted with caution.

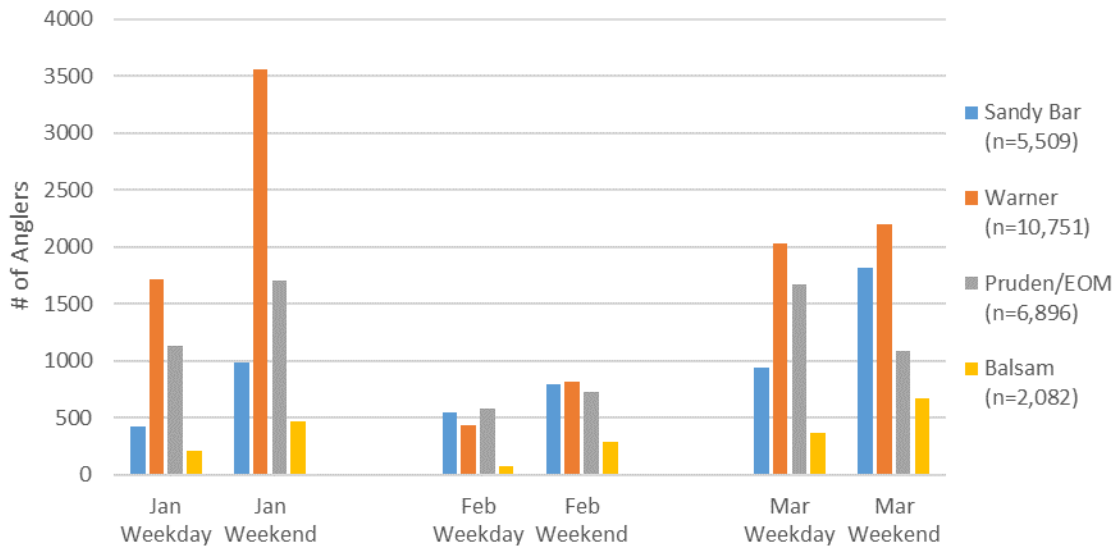


Figure 3: Number of anglers by access location and survey strata (extrapolated totals). Note: March totals include data collected from April 1 to the close of the season on April 3.

Angler numbers by access location and survey strata is illustrated in Figure 3. During January, Warner Road saw the most angler activity, particularly on weekends. The Pruden Creek / EOM accesses were also popular in January. The month of February in general was extremely cold with high windchill values. This is evident in low angler activity throughout the month at all locations. With milder weather in March, angler activity increased. Sandy Bar typically sees its highest angler activity in March as angler success increases in this area of the lake. Within the angling community, Sandy Bar is renowned for high quality late season Walleye fishing.

Creel Cards

Throughout the course of the creel survey, clerks distributed 1,392 creel cards to 2,999 anglers or groups of anglers as they arrived at an access prior to beginning their day of angling (Table 1). The return rate of creel cards was 56.8% overall (n=791 cards returned) allowing complete data to be compiled from an additional 1,790 anglers. Anglers fishing off Sandy Bar had the highest rate of creel card returns (74.6% returned, 84.5% of anglers) and those accessing off Warner Road the lowest (48.5% returned, 50.6% of anglers).

Table 1: Distribution and return rates of creel cards

	Sandy Bar		Warner Rd.		Pruden/EOM	
	# of Cards	# of Anglers	# of Cards	# of Anglers	# of Cards	# of Anglers
Returned	259	599	367	840	79	171
Not Returned	88	110	389	821	71	160
Total	347	709	756	1661	150	331
% Participation	74.6	84.5	48.5	50.6	52.7	51.7

	Balsam Harbour		Total	
	# of Cards	# of Anglers	# of Cards	# of Anglers
Returned	86	180	791	1790
Not Returned	53	118	601	1209
Total	139	298	1392	2999
% Participation	61.9	60.4	56.8	59.7

Catch Data

A summary of raw and extrapolated data for each access location as well as overall totals is presented in appendices 3a and 3b. Raw and extrapolated data for access locations by survey strata are provided in appendices 4 – 7.

Walleye is generally the target species for Lake Winnipeg anglers and is the species most commonly captured. Raw data compiled from all accesses combined indicate a total catch of 50,039 Walleye, of which 19,557 (39%) were harvested (Appendix 3a). Extrapolation of raw data suggests anglers fished an estimated 170,094 hours resulting in a minimum catch of 75,144 Walleye, of which 29,255 (39%) were harvested (Figure 4). Although more anglers frequented Warner Road, those accessing the lake via Pruden Creek / EOM produced more Walleye (figures 2 and 4).

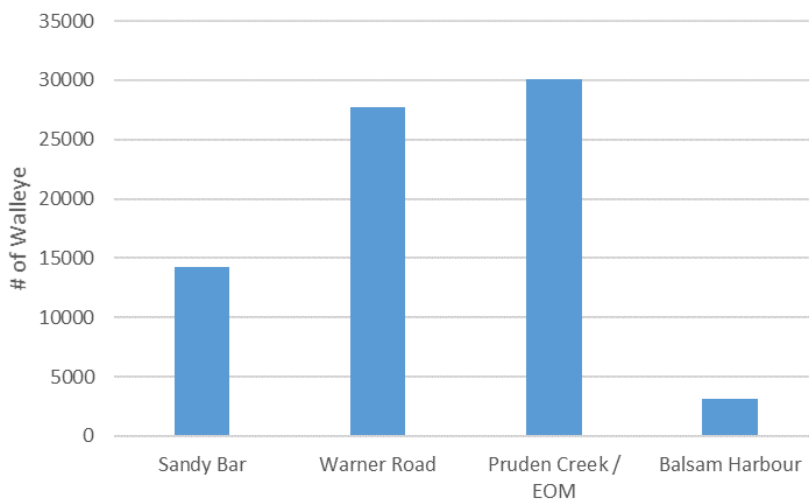


Figure 4: Number of Walleye captured by access location (extrapolated total = 75,144 Walleye).

Including Walleye, anglers reported the capture of 54,296 fish representing 10 species (Appendix 3b). The extrapolated total catch was 81,878 fish, of which 91.8% were Walleye. Sauger comprised 4.6% of the overall catch, followed by Burbot (1.6%), Northern Pike (1.0%), and Yellow Perch (0.7%). The remaining 0.3% consisted of Goldeye, Lake Whitefish, Cisco, Bullhead, and Freshwater Drum.

Although Sauger were the second most abundant species captured, the harvest rate of this species was among the lowest at only 4.3%. In Lake Winnipeg, all Walleye and Sauger measuring < 35cm total length must be released. Lake Winnipeg south basin index gillnetting data from 2009-2021 reveals that 95% of sauger (n=13,604) measured < 35cm fork length. Sauger is equally desirable as Walleye; however, the vast majority of Sauger existing in Lake Winnipeg are too small to be legally harvested by anglers.

Catch per Unit Effort

A common measure of angling success is catch per unit effort (CUE). CUE is a measure of the number of fish captured per unit of time and in the case of this study, is a measure of the number of fish captured per hour of angling effort. For example, a CUE of 1.0 refers to one fish captured per hour of angling. A CUE of 0.5 translates to one fish captured for every two hours of angling effort. Figure 5 illustrates the CUE calculated for Walleye, by survey strata and access location.

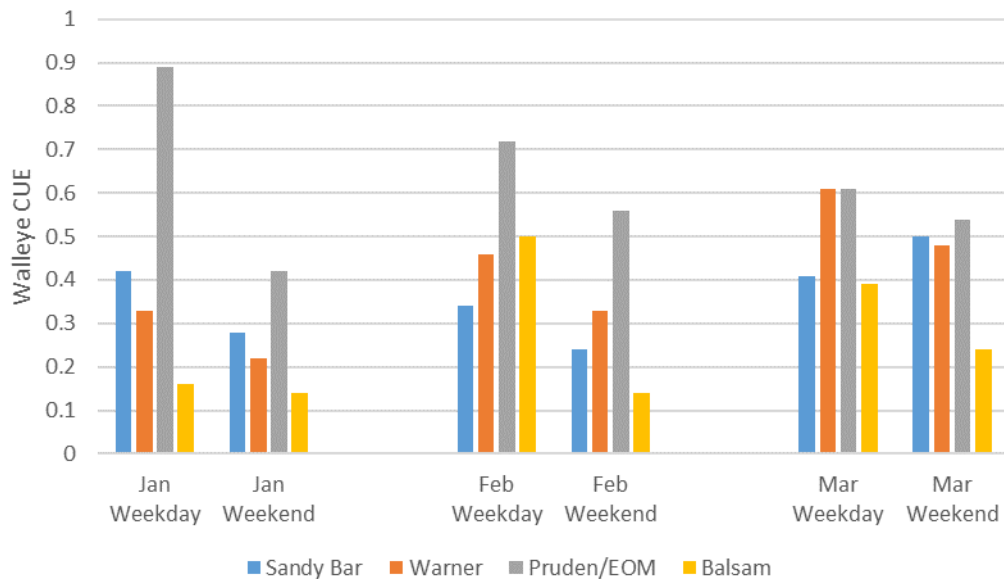


Figure 5: Catch per Unit Effort (CUE) for Walleye by survey strata and access location. (CUE = Number of Walleye caught per hour of angling effort)

In general, Figure 5 demonstrates that anglers using the Pruden Creek/EOM accesses were more successful than anglers at other locations across all survey strata. CUE for anglers at Warner Road and Sandy Bar was highest in March; however, in general CUE for all locations fluctuated throughout the survey.

Residency

Lake Winnipeg is home to a world class Walleye fishery, attracting anglers from across Manitoba, Canada, the United States, and the world. Residency data was collected from 17,626 anglers with 86.3% from Manitoba and 13.0% from the United States (Table 2). Of the 2,286 American anglers enumerated, 59.5% accessed Lake Winnipeg via Pruden Creek / EOM and 33.2% used Warner Road (Table 3). Only 2.1% of American anglers ventured onto the lake at Sandy Bar.

American anglers from 19 U.S. states were interviewed including some from as far as Alaska, Texas, and Florida. Aside from Manitoba residents, anglers from Saskatchewan, Alberta, British Columbia, Yukon, Ontario, Quebec, and Nova Scotia fished Lake Winnipeg. Anglers from as far as Norway and Thailand fished Lake Winnipeg as well.

Table 2: Residency demographics of anglers by fishing access locations

	Sandy Bar (n = 3631)	Warner Rd. (n=8313)	Pruden / EOM (n=4624)	Balsam Harbour (n=1058)	Total (n=17626)
% of Anglers:					
Manitoba	98.2	90.2	69.7	87.9	86.3
United States	1.3	9.1	29.4	11.2	13.0
Other	0.5	0.7	0.9	0.9	0.7

Table 3: Distribution of Foreign Resident (American) Anglers

	# of American Anglers	Distribution (%)
Sandy Bar	48	2.1
Warner Rd.	759	33.2
Pruden / EOM	1361	59.5
Balsam Harbour	118	5.2
Total	2286	100.0

Master Anglers

The number of Master Angler sized fish captured, by species and location, is presented in Table 4. Of the 926 reported Master Angler Walleye, 562 (60.7%) were captured by anglers accessing the lake via Pruden Creek / EOM, while 338 (36.5%) were captured by anglers accessing off Warner Road. It is suspected that the majority of Master Angler Walleye were captured near the mouth of the Red River.

American anglers annually make the trek to Lake Winnipeg in search of Master Angler sized Walleye. Considering only eight Master Angler sized Walleye were reported at Sandy Bar during the survey (Table 4) while 562 and 338 were reported at Pruden Creek/EOM and Warner Road, respectively, it is not surprising that Americans tend to fish in the southernmost region of the lake.

American anglers comprised only 9.1% of all anglers interviewed at Warner Road (Table 2), however this demographic captured 28% of all Master Angler sized Walleye captured off the Warner Road access (Table 5). Similarly, Americans represented 29.4% of Pruden Creek/EOM anglers but captured 45% of all Master Angler sized Walleye at these locations (tables 2 and 5).

Foreign resident anglers tend to be highly experienced, and many employ the services of professional outfitters. Considering the financial expense involved for American anglers to fish Lake Winnipeg, it is assumed that few are novice anglers. On the contrary, the skill level and experience of Manitoba anglers is likely highly variable, with a mix of novice and experienced anglers making day trips onto the lake.

Table 4. Master-Angler sized fish captured by species and location

	WALL*	SAUG	BURB	NRPK	YLPR	LKWH
Sandy Bar	8	0	12	2	4	0
Warner Rd	338	0	4	2	1	1
Pruden/EOM	562	1	0	1	0	1
Balsam	18	0	0	0	1	2
Total	926	1	16	5	6	4

* - Walleye (WALL), Sauger (SAUG), Burbot (BURB), Northern Pike (NRPK), Yellow Perch (YLPR), Lake Whitefish (LKWH)

Table 5. Number and % of Master-Angler sized Walleye captured residency and location

	Manitoba Resident	Foreign Resident	Non-Resident		Total	% Manitoba Resident	% Foreign Resident
			Canadian	Unknown			
Sandy Bar	6	1	1	0	8	75	13
Warner Rd	237	94	3	4	338	70	28
Pruden/EOM	299	251	5	7	562	53	45
Balsam	10	7	1	0	18	56	39

Outfitters

Among the 16,837 anglers participating in the creel survey, 506 anglers indicated they were employing the services of a licenced outfitter (Table 6). In comparison to non-guided anglers (n=16,331), guided anglers on average fished longer days and captured relatively more Walleye. Walleye catch per unit effort (CUE) was 0.77 fish per hour for guided anglers compared to 0.42 fish per hour for non-guided anglers. Guided anglers averaged 6.8 Walleye per outing compared to 2.9 Walleye per outing for non-guided anglers. Although relatively more successful, guided anglers harvested only 26.9% of their catch compared to a 40.0% harvest rate for non-guided anglers.

Table 6. Comparison between anglers guided by licenced outfitters and regular anglers (non-guided)

	Outfitter Clients	Non-guided Anglers
# of Anglers	506	16331
Total Effort (hrs)	4453	110523
Mean Angler Effort (hrs)	8.8	6.8
Total Walleye	3450	46589
WALL CUE	0.77	0.42
WALL per Outing	6.8	2.9
% Harvested	26.9	40.0
# of Master Angler WALL	102	824

Bait

Angling parties were surveyed regarding their use of bait with results compiled into three categories: live bait, frozen (dead) bait, or a combination of live and frozen bait. Considering the question was posed to each angling group as a whole (Figure 6A), it cannot be assumed that individual anglers within a group used the same lure/bait combinations. A subset of the data considering only individual anglers (i.e. group size = 1 angler) is illustrated in Figure 6B.

A total of 8,554 angling groups, representing 16,637 anglers, indicated 52.0% used frozen bait only, 25.2% used live bait only, and 22.8% used a combination of live and frozen bait. When combined, results indicate 74.8% of groups surveyed were in possession of frozen bait and 48.0% were in possession of live bait.

Results from 1,516 individual anglers surveyed indicate 63.8% used frozen bait exclusively while 20.4% used live bait exclusively. When combined, 79.6% of individual anglers surveyed were in possession of frozen bait and 36.2% were in possession of live bait.

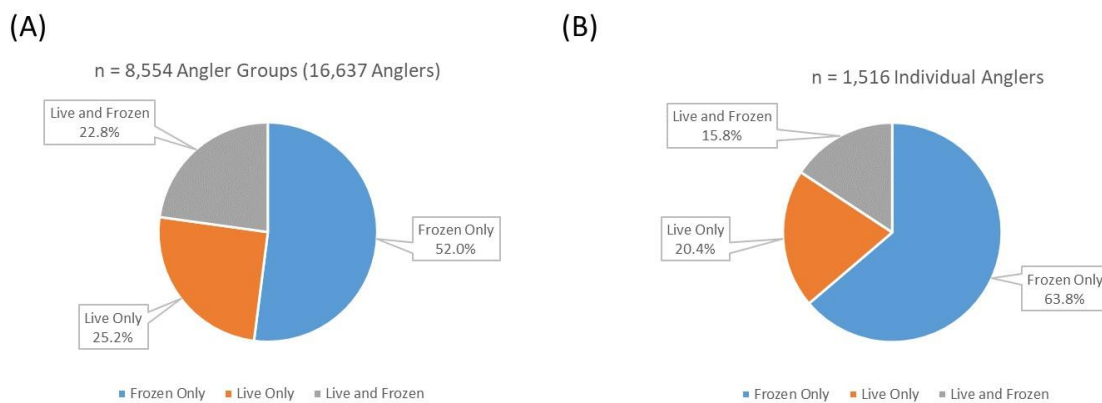


Figure 6. Bait preferences of anglers

Access-specific Summary

Sandy Bar

Creel clerks surveyed anglers at Sandy Bar on 44 out of a possible 88 days, including 20 out of a possible 27 weekend days (Appendix 4). Voluntary survey participation was high with 90% of anglers providing complete data. Raw data obtained from 3,571 anglers indicated a total of 9,732 Walleye captured, of which 5,596 (58%) were harvested.

Extrapolation of raw data estimates 5,509 anglers fished the Sandy Bar area between January 6 and April 3, 2022, catching a total of 14,243 Walleye, of which 8,293 (58%) were harvested. Among all access points surveyed, anglers at Sandy Bar harvested the highest proportion of their Walleye catch.

Walleye represented 90.4% of the overall catch followed by Burbot (6.0%) and Yellow Perch (1.9%). Only eight of the 926 reported Master Angler Walleye catches were recorded at Sandy Bar. Among the Burbot catch however, 12 of 16 reported Master Anglers were hooked at this location.

The Sandy Bar access is the most northerly access among those surveyed. Of the 3,631 anglers providing demographic information, 98.2% were Manitoba residents and only 1.3% were foreign residents.

Warner Road

Creel clerks were onsite at Warner Road for 71 out of a possible 89 survey days including 26 out of a possible 27 weekend days. Among all access areas on the south basin of Lake Winnipeg, Warner Road is arguably the most popular with ice anglers. Throughout the winter, a total of 7,719 anglers voluntarily participated in the survey representing almost 46% of all south basin anglers surveyed (Appendix 5). Angler participation was 79%. Summation of raw data yields a total of 19,686 Walleye captured, of which 39% (n=7,703) were harvested.

Extrapolation of raw data provides a minimum estimate of 27,715 Walleye captured, of which 10,842 were harvested throughout the winter. Walleye was the most abundant species captured comprising 91.2% of the overall catch, followed by Sauger at 6.6%.

Pruden Creek / End of Main

Creel clerks surveyed anglers at EOM until February 21 and Pruden Creek until March 21, after which times access to the lake was no longer possible from these locations. Surveys were conducted on 53 of a possible 76 days, including 21 out of a possible 23 weekend days.

Throughout the survey, 1,299 vehicles (2,562 anglers) were interviewed at the EOM access, of which approximately 35% indicated they were angling on Lake Winnipeg while 65% angled the Red River. Anglers indicating they only fished the Red River were excluded from data analysis.

Considering the EOM and Pruden Creek accesses combined, 4,506 anglers voluntarily participated in the survey representing a 95% compliance rate (Appendix 6). Surveyed anglers reported a total Walleye catch of 18,994 fish of which 5,412 (28%) were harvested. Extrapolation of raw data suggests 30,087 Walleye were captured, of which 8,473 were harvested.

Walleye comprised the highest proportion of the overall catch (93.3%) followed by Sauger (5%) and Northern Pike (1.1%).

Balsam Harbour

Creel clerks surveyed the Balsam Harbour access on 39 out of a possible 89 days, including 17 of a possible 27 weekend days. This access was scheduled for a more intense survey comparable to other accesses, however on numerous days clerks arrived on site to find the access drifted in and impassable with no anglers present. On these occasions, clerks were relocated to other accesses.

A total of 1,041 anglers participated in the survey, for a 77.2% participation rate (Appendix 7). Raw data indicates a total of 1,627 Walleye captured, of which 846 were harvested for a 52% harvest rate. Extrapolated results estimate a total Walleye catch of 3,099 fish, of which 1,647 were harvested. These data are an extreme underestimate of actual effort and harvest off the east shore of the south basin.

Appendix 1: Questionnaire form used in the 2021-22 creel survey. Each line of data represents one survey

2021 / 2022 Lake Winnipeg South Basin Winter Creel Survey

Date: _____ Survey Start Time: _____ Survey Crew: _____ PAGE ___ of ___
 Location: _____ Survey End Time: _____

	Arriving / Departing (A/D)	Time of Arrival	Time of Departure	Creel Card #	# of Vehicles	# of Anglers	Hours Fished	Postal/ Zip Code	Fish Harvested (# and Species)	Fish Released (# and Species)	Master Anglers	Bait (L/F/A)
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												

FALSE CAR COUNTER HITS: _____

FAILURE TO REPORT: _____

Appendix 2: Creel Card (front and back illustrated) distributed to anglers during the 2021-22 creel survey

NO: _____ RECREATIONAL ANGLER SURVEY

Date: _____ Postal / Zip Code: _____

of Anglers in your group: _____ # of Hours fished today: _____

Species of Fish	Total # Kept	Total # Released	# of Master Anglers

RECREATIONAL ANGLER SURVEY

Purpose: A creel survey, also known as a recreational angler survey, is a tool used by fisheries managers to assess the status of fish populations in a particular waterbody. Recreational angling in Manitoba has grown dramatically in recent years. Sustainable management of fish stocks requires fisheries managers to have a comprehensive understanding of annual harvest pressure by all resource users (i.e. commercial, recreational, and sustenance fishers). The goal of fisheries management is to allow resource users to maximize their harvest without compromising the future sustainability of fish stocks. Results of this survey will assist fisheries managers in monitoring fish stocks, maintaining the overall health and sustainability of this resource for generations to come.





Thank you for your participation and cooperation in managing Manitoba's fisheries!
 For more information/enquiries contact: info@mwf.mb.ca

Appendix 3a: Summary of raw and extrapolated data for each surveyed access point

WALLEYE	Sandy Bar	Warner Road	Pruden Creek / End of Main	Balsam Harbour	GRAND TOTAL
# of Days Surveyed	44	71	53	39	
# of Days Unsurveyed	44	18	23	50	
RAW DATA					
Total angler vehicles	1972	5060	2506	657	10195
Vehicles participating	1783	4022	2371	507	8683
% vehicles participating	90	79	95	77	85
Anglers participating	3571	7719	4506	1041	16837
Total effort (hrs)	24245	50329	33502	6900	114976
# of walleye caught	9732	19686	18994	1627	50039
# of walleye harvested	5596	7703	5412	846	19557
% walleye harvested	58	39	28	52	39
EXTRAPOLATED					
# of vehicles	2831	5640	3744	1027	13242
# of anglers	5509	10751	6896	2082	25238
Total effort (hrs)	36283	69980	50037	13795	170094
# of walleye caught	14243	27715	30087	3099	75144
# of walleye harvested	8293	10842	8473	1647	29255
% walleye harvested	58	39	28	53	39

Appendix 3b: Summary of raw and extrapolated catch data for all accesses combined

Raw Data	WALL*	SAUG	BURB	NRPK	YLPR	GOLD	LKWH	CISC	BULL	FRDR	Total
# caught	50039	2442	835	510	326	78	41	21	3	1	54296
# harvested	19557	102	168	93	103	24	7	5	0	0	20059
% harvested	39	4	20	18	32	31	17	24	0	0	37
% of catch	92.2	4.5	1.5	0.9	0.6	0.1	0.1	0.039	0.006	0.002	-

Extrapolated	WALL	SAUG	BURB	NRPK	YLPR	GOLD	LKWH	CISC	BULL	FRDR	Total
# caught	75144	3803	1307	818	580	134	56	30	4	2	81878
# harvested	29255	163	257	138	175	47	9	8	0	0	30052
% harvested	39	4	20	17	30	35	16	27	0	0	37
% of catch	91.8	4.6	1.6	1.0	0.7	0.2	0.1	0.037	0.005	0.002	-

* - Walleye (WALL), Sauger (SAUG), Burbot (BURB), Northern Pike (NRPK), Yellow Perch (YLPR), Goldeye (GOLD), Lake Whitefish (LKWH), Cisco (CISC), Bullhead (BULL), Freshwater Drum (FRDR)

Appendix 4: Sandy Bar – summary of results

SANDY BAR	January*		February		March / April		Grand Total
	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend	
# of Days Surveyed	6	5	6	7	12	8	44
# of Days Unsurveyed	12	3	13	2	12	2	44
RAW DATA							
Total angler vehicles	70	360	14	362	364	802	1972
Vehicles participating	45	319	14	336	331	738	1783
% vehicles participating	64	89	100	93	91	92	90
Anglers participating	68	639	26	670	625	1543	3571
Total effort (hrs)	328	3749	153	4214	5016	10786	24245
Mean angler effort (hrs)	4.82	5.87	5.88	6.29	8.03	6.99	
# of walleye caught	138	1037	52	1023	2062	5420	9732
# of walleye harvested	84	655	32	657	1235	2933	5596
% walleye harvested	61	63	62	64	60	54	58
Walleye CUE	0.42	0.28	0.34	0.24	0.41	0.50	
Walleye per outing	2.0	1.6	2.0	1.5	3.3	3.5	
EXTRAPOLATED							
# of vehicles	277	493	295	400	498	868	2831
# of anglers	419	988	548	798	941	1815	5509
Total effort (hrs)	2016	5794	3224	5017	7547	12685	36283
# of walleye caught	849	1603	1096	1218	3102	6375	14243
# of walleye harvested	517	1012	674	782	1858	3450	8293
% walleye harvested	61	63	61	64	60	54	58

* - January data extrapolated between Jan 6 and 31 only.

Raw Data	WALL*	SAUG	BURB	NRPK	YLPR	GOLD	LKWH	CISC
# caught	9732	95	587	74	174	1	6	7
# harvested	5596	4	126	17	54	0	1	4
% harvested	57.5	4.2	21.5	23.0	31.0	0.0	16.7	57.1
% of catch	91.2	0.9	5.5	0.7	1.6	0.0	0.1	0.1

Extrapolated	WALL	SAUG	BURB	NRPK	YLPR	GOLD	LKWH	CISC
# caught	14243	132	945	124	299	2	8	9
# harvested	8293	5	190	22	93	0	1	6
% harvested	58.2	3.8	20.1	17.7	31.1	0.0	12.5	66.7
% of catch	90.4	0.8	6.0	0.8	1.9	0.0	0.1	0.1

* - Walleye (WALL), Sauger (SAUG), Burbot (BURB), Northern Pike (NRPK), Yellow Perch (YLPR), Goldeye (GOLD), Lake Whitefish (LKWH), Cisco (CISC)

Appendix 5: Warner Road – summary of results

WARNER ROAD	January*		February		March / April		Total
	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend	
# of Days Surveyed	15	8	12	8	18	10	71
# of Days Unsurveyed	4	0	7	1	6	0	18
RAW DATA							
Total angler vehicles	790	1697	148	404	860	1161	5060
Vehicles participating	583	1303	121	333	736	946	4022
% vehicles participating	74	77	82	82	86	81	79
Anglers participating	1050	2732	197	626	1323	1791	7719
Total effort (hrs)	6122	16304	1299	4263	9462	12879	50329
Mean angler effort (hrs)	5.83	5.97	6.59	6.81	7.15	7.19	
# of walleye caught	1992	3659	599	1391	5807	6238	19686
# of walleye harvested	981	1549	192	470	2123	2388	7703
% walleye harvested	49	42	32	34	37	38	39
Walleye CUE	0.33	0.22	0.46	0.33	0.61	0.48	
Walleye per outing	1.9	1.3	3.0	2.2	4.4	3.5	
EXTRAPOLATED							
# of vehicles	951	1697	265	437	1129	1161	5640
# of anglers	1713	3558	431	822	2029	2198	10751
Total effort (hrs)	9987	21234	2844	5594	14514	15806	69980
# of walleye caught	3249	4765	1312	1825	8908	7656	27715
# of walleye harvested	1600	2017	420	617	3257	2931	10842
% walleye harvested	49	42	32	34	37	38	39

* - January data extrapolated between Jan 5 and 31 only.

Raw Data	WALL*	SAUG	BURB	NRPK	YLPR	GOLD	LKWH	CISC	BULL
# caught	19686	1423	152	138	99	51	20	9	3
# harvested	7703	61	19	29	30	11	2	0	0
% harvested	39.1	4.3	12.5	21.0	30.3	21.6	10.0	0.0	0.0
% of catch	91.2	6.6	0.7	0.6	0.5	0.2	0.1	0.0	0.0

Extrapolated	WALL	SAUG	BURB	NRPK	YLPR	GOLD	LKWH	CISC	BULL
# caught	27715	2021	213	200	140	69	28	12	4
# harvested	10842	89	28	40	43	14	3	0	0
% harvested	39.1	4.4	13.1	20.0	30.7	20.3	10.7	0.0	0.0
% of catch	91.2	6.6	0.7	0.7	0.5	0.2	0.1	0.0	0.0

* - Walleye (WALL), Sauger (SAUG), Burbot (BURB), Northern Pike (NRPK), Yellow Perch (YLPR), Goldeye (GOLD), Lake Whitefish (LKWH), Cisco (CISC), Bullhead (BULL)

Appendix 6: Pruden Creek / EOM - summary of results

PRUDEN CREEK / EOM	January*		February**		March***		Total
	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend	
# of Days Surveyed	10	8	10	7	12	6	53
# of Days Unsurveyed	9	0	9	2	3	0	23
RAW DATA							
Total angler vehicles	190	602	138	333	696	547	2506
Vehicles participating	178	579	126	320	647	521	2371
% vehicles participating	94	96	91	96	93	95	95
Anglers participating	273	1074	228	595	1301	1035	4506
Total effort (hrs)	1814	6803	1551	4510	10818	8008	33502
Mean angler effort (hrs)	6.64	6.33	6.80	7.58	8.31	7.74	
# of walleye caught	1615	2828	1119	2529	6549	4354	18994
# of walleye harvested	404	1044	317	781	1604	1262	5412
% walleye harvested	25	37	28	31	24	29	28
Walleye CUE	0.89	0.42	0.72	0.56	0.61	0.54	
Walleye per outing	5.9	2.6	4.9	4.3	5.0	4.2	
EXTRAPOLATED							
# of vehicles	740	917	318	392	830	547	3744
# of anglers	1135	1701	575	729	1669	1087	6896
Total effort (hrs)	7541	10774	3913	5525	13877	8407	50037
# of walleye caught	6714	4479	2824	3098	8401	4571	30087
# of walleye harvested	1680	1653	800	957	2058	1325	8473
% walleye harvested	25	37	28	31	24	29	28

* - January data extrapolated between Jan 5 and 31 only.

** - February 21 – last day of surveying at EOM. Access closed to public following this day due to the onset of ice cutting

*** - March 21 – last day of surveying at Pruden Creek. Access no longer useable due to spring thaw

Raw Data	WALL*	SAUG	BURB	NRPK	YLPR	GOLD	LKWH	CISC	FRDR
# caught	18994	907	59	236	15	18	9	3	1
# harvested	5412	36	7	30	2	5	4	0	0
% harvested	28.5	4.0	11.9	12.7	13.3	27.8	44.4	0.0	0.0
% of catch	93.8	4.5	0.3	1.2	0.1	0.1	0.0	0.0	0.0

Extrapolated	WALL	SAUG	BURB	NRPK	YLPR	GOLD	LKWH	CISC	FRDR
# caught	30087	1614	84	364	27	42	11	4	2
# harvested	8473	66	9	44	2	12	5	0	0
% harvested	28.2	4.1	10.7	12.1	7.4	28.6	45.5	0.0	0.0
% of catch	93.3	5.0	0.3	1.1	0.1	0.1	0.0	0.0	0.0

* - Walleye (WALL), Sauger (SAUG), Burbot (BURB), Northern Pike (NRPK), Yellow Perch (YLPR), Goldeye (GOLD), Lake Whitefish (LKWH), Cisco (CISC), Freshwater Drum (FRDR)

Appendix 7: Balsam Harbour - summary of results

BALSAM HARBOUR	January*		February		March / April		Total
	Weekday	Weekend	Weekday	Weekend	Weekday	Weekend	
# of Days Surveyed	8	5	3	3	11	9	39
# of Days Unsurveyed	11	3	16	6	13	1	50
RAW DATA							
Total angler vehicles	47	128	10	62	132	278	657
Vehicles participating	38	83	4	46	110	226	507
% vehicles participating	81	65	40	74	83	81	77
Anglers participating	71	179	7	92	200	492	1041
Total effort (hrs)	400	1378	30	606	1387	3100	6900
Mean angler effort (hrs)	5.63	7.70	4.29	6.58	6.93	6.30	
# of walleye caught	62	199	15	83	535	733	1627
# of walleye harvested	42	133	9	40	225	397	846
% walleye harvested	68	67	60	48	42	54	52
Walleye CUE	0.16	0.14	0.50	0.14	0.39	0.24	
Walleye per outing	0.9	1.1	2.1	0.9	2.7	1.5	
EXTRAPOLATED							
# of vehicles	113	219	42	145	199	309	1027
# of anglers	211	472	74	290	362	673	2082
Total effort (hrs)	1190	3635	315	1909	2508	4239	13795
# of walleye caught	184	525	158	262	968	1002	3099
# of walleye harvested	125	351	95	126	407	543	1647
% walleye harvested	68	67	60	48	42	54	53

* - January data extrapolated between Jan 5 and 31 only.

Raw Data	WALL*	SAUG	BURB	NRPK	YLPR	GOLD	LKWH	CISC
# caught	1627	17	37	62	38	8	6	2
# harvested	846	1	16	17	17	8	0	1
% harvested	52.0	5.9	43.2	27.4	44.7	100.0	0.0	50.0
% of catch	90.5	0.9	2.1	3.5	2.1	0.4	0.3	0.1

Extrapolated	WALL	SAUG	BURB	NRPK	YLPR	GOLD	LKWH	CISC
# caught	3099	36	65	130	114	21	9	5
# harvested	1647	3	30	32	37	21	0	2
% harvested	53.1	8.3	46.2	24.6	32.5	100.0	0.0	40.0
% of catch	89.1	1.0	1.9	3.7	3.3	0.6	0.3	0.1

* - Walleye (WALL), Sauger (SAUG), Burbot (BURB), Northern Pike (NRPK), Yellow Perch (YLPR), Goldeye (GOLD), Lake Whitefish (LKWH), Cisco (CISC)