

WISCONSIN DEPARTMENT OF NATURAL RESOURCES COMMERCIAL TRAWLER VIDEO MONITORING REPORT

Reporting Period: December 2022 - July 2023

Contributors

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Introduction and Methods

Two video cameras placed in the stern of the commercial trawler, Peter/Paul, record the entire commercial trawl catch. Cameras record the entire time the boat engine is running on a given trawling day. One camera captures a portion of the aft end where the cod end of the net is emptied into a boxed-in area on the deck. The second camera is positioned above the fish cleaning area and records bycatch being passed over a measuring board before being discarded.

Protocols for reviewing the catch from the videos are provided briefly in this report. For a full description of the protocols, see Trawl Monitor Standard Operating Procedures. Video footage is downloaded approximately monthly, and two days of trawl video are randomly selected each month for review. Each month’s video review currently takes 1-2 hours, depending upon the clarity of the catch images in the recordings. Using footage from both cameras, total harvested lake whitefish and bycatch are quantified for all trawl drags on the selected dates. The total harvest in pounds can be estimated from the following formula: $(N * X)/1.17$, where N = the number of fish estimated (by box), X = estimated mean weight of an individual harvested fish, and 1.17 is the conversion of round to dressed weight. Length measurements of individual fish in the bycatch can be approximated from the recordings as they are passed over the measuring board under the second camera. Reported and observed lake trout and sub-legal whitefish bycatch numbers (converted to weight) are also calculated as a proportion of the daily harvest of whitefish. During August, these values are used as decision points to determine whether trawl fishers must change their fishing practices or cease trawling for a period in the event of high weight of bycatch species relative to the whitefish weight (Table 1) as required in NR 25.09(5) (bm).

Table 1. The trawl rule specifies actions that must be taken if too much bycatch of illegal fish is encountered in trawling activities. Bycatch includes illegal fish species and sub-legal sized whitefish which must all be returned to the water. Decision points and required resulting actions when trigger levels are met are specified in the table and are specific to time of year.

TRIGGER: WHEN BYCATCH AS A PROPORTION OF THE TOTAL LEGAL CATCH REACHES THE FOLLOWING LEVEL:	ACTION: REMOVE THE TRAWL FROM THE WATER AND TAKE THE FOLLOWING ACTION IF TRAWLING THE SAME DAY:	TIME OF YEAR
10% or more (by weight or numbers) in a single trawl drag	<ul style="list-style-type: none"> • Move/operate all parts of the trawl at least 3 miles from the site of the bycatch trigger; or • Move/operate all parts of the trawl to a water depth where no part of the trawl operates within 30 feet (5 fathoms) of the water depth in which the bycatch occurred 	All year

Daily average of 10 to 49.9% (by weight) or at least two lake sturgeon in a single week (Sunday to Saturday)	Move/operate all parts of the trawl at least 6 miles from the site of the bycatch trigger	August
More than 50% (by weight) or three or more lake sturgeon in a single day	Cease all trawling for the next three days	August

This report contains trawl data from December 2022 through July 2023, the last month the fisher trawled before the September trawl season closure. The number and estimated weight of fish observed in the video recordings are compared to numbers and estimated/actual weights reported by the commercial fishers in the Electronic Fish Harvest Reporting System (EFHRS). Fishers must provide an initial estimate of catch in EFHRS before docking and a final total is later reported after they have processed their catch. Burbot are not considered a gamefish but must be reported by commercial fishers if they are harvested.

Table 2. Monthly totals of trawl casts made by commercial fishers and casts reviewed from video recordings between December 2022 and July 2023. Numbers in parentheses are percentages of casts reviewed of the total casts made by commercial fishers.

	CASTS MADE	CASTS REVIEWED
December	41	6 (15)
January	93	8 (9)
February	68	9 (13)
March	81	10 (12)
April	83	9 (11)
May	67	10 (15)
June	44	9 (20)
July	10	10 (100)
Total	487	71 (14)

Results

LAKE WHITEFISH HARVEST

Video from 17 days of fishing effort were reviewed including 71 trawl casts of approximately one hour each (Table 2). During this period, the fishers made 487 trawl casts and 14% of the casts were reviewed via video. The estimates of the dressed weight of whitefish harvested for a given date are generally close to the actual harvest reported into

EFHRS. (Table 3). Figure 1 shows a photo of boxes of fish stacked, allowing for estimates of fish counts and total weight.

BYCATCH

The difference in the number of bycatch fish reported by the fishers compared to the number observed in the recordings has declined considerably as the commercial trawl fishery has progressed over years. Aside from one event (6/19/2023) where it appears the fisher neglected to record a considerable number of sub-legal lake whitefish, the disparity in under-reporting lake trout and sub-legal lake whitefish was generally three fish or fewer (Table 4). The re-institution of the use of the measuring board and placement of fish on the board has helped increase the accuracy of counting sub-legal whitefish, as identifying whitefish as sub-legal size from the video footage can be very difficult. In contrast to some of the previous years, few other species of trout or salmon (n=4 fish) were observed or reported in the 17 days reviewed for this period. However, round whitefish were considerably more prevalent in the catches compared to some previous years.

The number of sub-legal whitefish caught in the trawl is still generally low, particularly as a percentage of the catch of legal-sized whitefish (0 – 1%) (Table 5). While the percentage of lake trout in the overall catch is generally low in most months, the mid-late summer catches have typically increased substantially as a percentage of the legal whitefish catch, potentially requiring a change to fishing practices to minimize bycatch. This was again the case in 2023, as the percentage of lake trout (20% - 130%) in the whitefish catch was high enough for each date evaluated in July to have warranted various changes in fishing practices (Table 5). However, on only one other observation date (5/8/2023) was the percentage of lake trout (13%) caught high enough to trigger a change in fishing practices. For this reporting period, four of the 17 days (24%) reviewed resulted in whitefish catches with >10% bycatch. During the previous evaluation period, it was revealed that the addition of three days of video observation per month increased the percentage of dates with >10% bycatch from 12% to 32%, a substantial increase in required changes to fishing practices. Therefore, the examination of additional days of video recordings (or EFHRS data) may be prudent if it is determined that a random selection of two dates per month is not enough to properly evaluate bycatch rates. There continues to be evidence to support the premise that lake trout catches increase as a proportion of lake whitefish catch during the mid-late summer months.

Summary and Recommendations

Trawl video monitoring protocols continue to work well. The system functions as designed and is on during all trawling operations. We have received exceptional cooperation from fishers in scheduling and downloading the data from the trawler video recorder. In most cases, staff have been able to identify fish brought aboard the trawler. We are also able to accurately determine the weight harvested when compared to the actual reported harvest.

The concern over immediate and latent mortality for fish discarded from the trawl fishery remains an issue. Fish caught in the trawl bag undergo a substantial level of stress and

physical trauma due to crowding in the bag (Figure 2). While previous monitoring done during the experimental portion of the trawl fishery (before current rules were implemented) suggested that some discarded fish do survive the trawling process, the conditions under which these observations were made were limited. For example, only fish that were considered to be in good health were tagged for the study and fish were given time to recover in a tank prior to tagging. Finally, the evaluation was conducted during the initial stage of the trawl monitoring study where trawl time was limited to 30 minutes. The time limit was extended during the study to the currently allowed 60 minutes.

To date the commercial trawler appears to be following the recommended courses of action (e.g., passing most fish in front of camera above the measuring board, time stamping video recorder, maintaining the recording equipment, etc.) and most recommendations for improvement of the process that were communicated to the trawler since the first trawling year have been followed. (See previous Commercial Trawling Video Reports for past recommended courses of action). One rule, below in italics, continues to be inconsistently followed. Video monitoring indicates that while whitefish that are close to the legal size are generally placed on the measuring board, those that are clearly sub-legal continue to be discarded directly through the back door of the trawler. While the bycatch numbers observed in the videos and those reported in EFHRS are generally very close, the opportunity to collect relative size information of fish in the bycatch is a department priority and the recommendation (below) is still relevant.

- 1) Place the measuring board on the dressing table for a clear view below the camera, as required in NR 25.09 (2m) (a). Gathering accurate information on the number of bycatch species and sub-legal and discarded lake whitefish size will be dependent on viewing each fish independently. Given the occasional disparity between our counts and those of the fishers', this cannot be achieved well enough using only the camera facing aft. Therefore, each fish to be discarded should be placed on the measuring board on the dressing table directly below that camera per NR 25.09 (2m) (a). This will also provide information on the size of sub-legal and discarded lake whitefish.*

Table 3. Daily totals of video observed, estimated and actual reported harvest for lake whitefish on days selected for video analysis. The difference between observed and actual harvest is still an estimate because harvest in video observations is estimated as described above.

DATE OF TRAWL	HARVESTED WHITEFISH (DRESSED WEIGHT)			DIFFERENCE OBS. – ACTUAL HARVEST
	OBS. VIDEO	EST. HARVEST EFHRS	ACTUAL HARVEST EFHRS	
12/12/2022	1795	1800	1846	-51
12/27/2022	1496	1500	1472	24
01/08/2023	1350	1400	1432	-82
01/10/2023	2479	2700	2656	-177
02/05/2023	1061	950	952	109
02/25/2023	1235	1050	1045	190
03/08/2023	1752	1450	1427	325
03/20/2023	962	800	766	196
04/19/2023	1126	1000	1045	81
04/21/2023	929	800	787	142
05/8/2023	874	750	737	137
05/11/2023	1245	1200	1244	1
06/19/2023	2412	2700	2560	-148
06/26/2023	880	900	980	-100
07/03/2023	97	100	116	-19
07/06/2023	192	200	214	-22
07/13/2023	92	100	95	-3



Figure 1. Fishers filling fish boxes and stacking alongside make it relatively easy to determine the estimated weight of whitefish for the day. *Photo credit: Wisconsin DNR.*



Figure 2. Cod end of trawl full of lake whitefish as well as bycatch. *Photo credit: Wisconsin DNR.*

Table 4. Daily totals of video observed and EFHRS reported bycatch from the Lake Michigan lake whitefish trawl fishery, by number. Red numbers indicate difference between observed and reported catch is ≥ 10 fish. *Commercial fishers report burbot in lbs and are counted in the video observations.

DATE OF TRAWL	NUMBER OF TRAWL DRAGS	LAKE TROUT		BURBOT*		SUB-LEGAL Lake Whitefish		OTHER BYCATCH	
		OBS VIDEO	REPT EFHRS	OBS VIDEO	REPT EFHRS	OBS VIDEO	REPT EFHRS	OBSERVED VIDEO	REPORTED EFHRS
12/12/2022	4	16	13	5	15	1	2	1 sea lamprey	
12/27/2022	2	9	9	3	9	0	0		
01/08/2023	5	14	13	5	20	0	0		
01/10/2023	3	17	17	9	50	0	1		
02/05/2023	4	14	14	12	75	1	1		
02/25/2023	5	0	0	12	75	2	2		
03/08/2023	5	23	20	23	125	2	3	1 smallmouth bass	
03/20/2023	5	2	4	4	5	0	0		
04/19/2023	5	11	12	12	50	0	1		
04/21/2023	4	10	11	7	25	6	6		
05/8/2023	5	16	18	4	15	0	0		
05/11/2023	5	18	18	4	15	0	1		
06/19/2023	5	9	10	2	10	12	4	26 round whitefish	30 round whitefish
06/26/2023	4	6	7	0	0	1	2	37 round whitefish, 2 Chinook salmon	40 round whitefish, 2 Chinook salmon
07/03/2023	3	4	5	0	0	0	0	16 round whitefish, 1 brown trout	25 round whitefish, 1 brown trout
07/06/2023	3	33	30	1	5	1	1		
07/13/2023	4	21	19	1	5	0	0	9 round whitefish, 1 Chinook salmon	15 round whitefish, 1 Chinook salmon
Total	71	223	220	104	499	26	24		

Table 5. Daily video observed and EFHRS reported lake trout and sublegal lake whitefish calculated as a percentage of actual harvested (lbs) lake whitefish. Highlighted cells are where the percent of the illegal catch was $\geq 10\%$ of the legal catch for observed and/or reported data.

DATE OF TRAWL	LAKE TROUT		SUB-LEGAL WHITEFISH	
	VIDEO OBSERVED AS A PERCENTAGE OF WHITEFISH HARVEST	EFHRS REPORTED AS A PERCENTAGE OF WHITEFISH HARVEST	VIDEO OBSERVED AS A PERCENTAGE OF WHITEFISH HARVEST	EFHRS REPORTED AS A PERCENTAGE OF WHITEFISH HARVEST
12/12/2022	5	4	0	0
12/27/2022	4	4	0	0
01/08/2023	6	5	0	0
01/10/2023	4	4	0	0
02/05/2023	9	9	0	0
02/25/2023	0	0	0	0
03/08/2023	9	8	0	0
03/20/2023	2	3	0	0
04/19/2023	6	7	0	0
04/21/2023	7	8	1	1
05/8/2023	13	14	0	0
05/11/2023	8	8	0	0
06/19/2023	2	2	1	0
06/26/2023	4	4	0	0
07/03/2023	20	25	0	0
07/06/2023	90	82	1	1
07/13/2023	130	117	0	0