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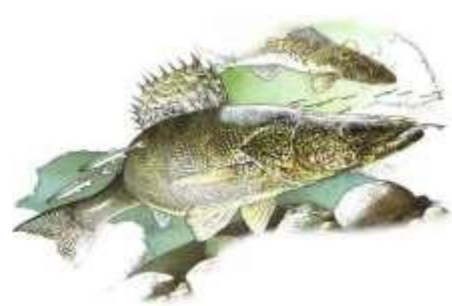
MSC SUSTAINABLE FISHERIES CERTIFICATION

On-Site Surveillance Visit

Lake Erie Multispecies Commercial Fishery

Yellow Perch

Walleye



2nd Surveillance Audit

November 2017

Certificate Code : **F-ACO-0052**
Prepared For: **Ontario Commercial Fisheries Association Blenheim, Ontario**
Prepared By: **Acoura Marine**
Authors: **Sara Adlerstein, John Casselman, Ian Scott**

Contents

1 FISHERY INFORMATION

Fishery	Lake Erie Multispecies Commercial Fishery		
Species & Stock	Yellow Perch (*Perca flavescens*) Walleye (*Sander vitreus*)		
Date certified	20th August 2015	**Date of expiry**	19th August 2020
Surveillance level and type			
Date of surveillance audit	27/09/2017		
Surveillance stage	2nd Surveillance		
Surveillance team	Lead Assessor & P3: Ian Scott. Assessors: Sara Adlerstein (P2) John Casselman (P1)		
CAB name	Acoura Marine		
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	Contact	Billy Hynes	
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	Contact	Jane Graham	

2 ASSESSMENT PROCESS

2.1 The Surveillance

2.1.1 Scope

This report outlines the findings of the 2nd Annual Surveillance of the Lake Erie Yellow Perch and Lake Erie Walleye Commercial fisheries. The scope of the certified fishery and this surveillance is specified in the Units of Certification (below).

2.1.2 Aims

The purpose of the annual Surveillance Report is fourfold; to:

1. Identify and report on any material changes to the circumstances and practices affecting the original complying assessment of the fishery;
2. Monitor the progress achieved in improving the score of those performance indicators (PI) that were scored as below “good practice” (a score of 80 or above) but above “minimum acceptable practice” (a score of 60 or above), as covered in the “conditions to certification” defined in the Public Report and in the corresponding Client Action Plan;
3. Report on the actions taken in response to the (non-binding) “recommendations” made in the Public Report; and
4. Rescore any PIs to respond to any identified substantive changes in practice or circumstances since publication of the PCDR, including those PIs that achieved an initial score of 60<80.

Please note: The primary focus of a surveillance audit is to assess substantive changes in the fishery since publication of the PCR. Accordingly, this surveillance report should be reviewed in the context of the PCR.[1]

2.2 The Certified Fishery

2.2.1 Species & Fishing Gear

The certified Lake Erie Multi-Species Commercial Fishery covers: Yellow Perch (*Perca flavescens*) using small mesh gillnet and small mesh trap net; and Walleye *(Sander vitreus*) using large mesh gillnet.

2.2.2 History

The fishery was certified to the MSC standard by Intertek Fisheries Certification (IFC) on the 20th August 2015 after an assessment that commenced on 18th June 2013. In September 2015, Acoura Marine (AM) assumed the IFC fisheries certification portfolio. In January 2016, the client confirmed AM as the CAB contracted for the Lake Erie Multispecies Commercial Fishery. The first annual surveillance report was completed by AM in October 2016.

2.2.3 Scope

AM confirms that the fishery remains in scope.

1 https://www.msc.org/track-a-fishery/fisheries-in-the-program/certified/inland/lake-erie-multi-species-commercial/lake-erie-multi-species-commercial

2.2.4 Units of Certification

The 8 Units of Certification (UoC) are listed below. The vessels licensed to fish the individual UoC are covered by the certification when the catch is sold through a member of the client group.

UoC 1

Species	Yellow Perch
Stock	Lake Erie yellow perch, QZ1
Geographical area	Lake Erie: QZ1
Harvest method	Small Mesh Gill net
Client Group	Ontario Commercial Fisheries Association
Other Eligible Fishers	None

UoC 2

Species	Yellow Perch
Stock	Lake Erie yellow perch, QZ2
Geographical area	Lake Erie: QZ2
Harvest method	Small Mesh Gill net
Client Group	OCFA
Other Eligible Fishers	None

UoC 3

Species	Yellow Perch
Stock	Lake Erie yellow perch, QZ3(E)
Geographical area	Lake Erie: QZ3(E)
Harvest method	Small Mesh Gill net
Client Group	OCFA
Other Eligible Fishers	None

UoC 4

Species	Yellow Perch
Stock	Lake Erie yellow perch, QZ3(W)
Geographical area	Lake Erie: QZ3(W)
Harvest method	Small Mesh Gill net
Client Group	OCFA
Other Eligible Fishers	None

UoC 5

Species	Yellow Perch
Stock	Lake Erie yellow perch, MU1
Geographical area	Lake Erie: MU1
Harvest method	Small mesh Trap net
Client Group	OCFA
Other Eligible Fishers	None

UoC 6

Species	Yellow Perch
Stock	Lake Erie yellow perch, MU2
Geographical area	Lake Erie: MU2
Harvest method	Small mesh Trap net
Client Group	OCFA
Other Eligible Fishers	None

UoC 7

Species	Yellow Perch
Stock	Lake Erie yellow perch, MU3
Geographical area	Lake Erie: MU3
Harvest method	Small mesh Trap net
Client Group	OCFA
Other Eligible Fishers	None

UoC 8

Species	Walleye (Sander vitreus)
Stock	Lake Erie walleye
Geographical area	Lake Erie
Harvest method	Large mesh Gill net
Client Group	OCFA
Other Eligible Fishers	None

2.2.5 Certification Scores

The scores in the initial certification are shown in Tables 1 & 2.

Table 1: Yellow Perch: Principle Scores at Certification

	Small Mesh Gill Net				Small Mesh Trap Net		
	QZ1	**QZ2**	**QZ3(E)**	**QZ3(W)**	**MU1**	**MU2**	**MU3**
P 1 – Target Species	81.9	84.4	84.4	84.4	81.9	84.4	84.4
P 2 – Ecosystem	81.7	81.7	81.7	81.7	80.0	81.3	81.7
P 3 – Management System	85.3	85.3	85.3	85.3	85.3	85.3	85.3

Table 2: Walleye: Principle Scores at Certification

	Large Mesh Gill net
P 1 – Target Species	90.0
P 2 – Ecosystem	81.7
P 3 – Management System	85.3

2.3 The 2nd Surveillance Audit Process

2.3.1 Team

The on-site surveillance visit was carried out by Ian Scott. Sara Adlerstein and John Casselman participated in the client meeting remotely. Scott was Team Leader. John Casselman replaced Bob O'Boyle in the assessment team. John is one of the leading Canadian experts on freshwater fisheries and he has contributed to several MSC certification reports.

2.3.2 Date & Location

The site visit took place in Blenheim, Ontario on September 27th, 2017.

2.3.3 Stakeholder Consultation & Meetings

The audit was announced on the MSC web site on in late August 2017. In addition, identified stakeholders were informed of the up-coming surveillance audit by email. The auditors did not receive any response from stakeholders.

In the meeting (table 3) there was a thorough review of the fishery, with emphasis on stock status and the progress towards meeting the conditions to certification.

Table 3: Client Meeting: Blenheim September 27, 2017

Ian Scott	Acoura	Lead Auditor / P3
Sara Adlerstein (via conference call)	Acoura	P2
John Casselman (via conference call)	Acoura	P1
Jane Graham	OCFA	
Kevin Reid	OCFA	
Rich Drouin	LEMU	

The draft report was sent to the client in week beginning October 16th. Subsequently, the final report was published on the MSC web site at the end of November 2017.

2.3.4 What was inspected

The meeting covered: a confidentiality statement by Acoura, introduction, stakeholder interest in the fishery, stock status update, conditions review, other information needs and onward process.

2.4 Surveillance Standard

2.4.1 MSC Standards, Requirements and Guidance

This surveillance audit was carried out per the MSC Fisheries Certification Requirements FAM v1.3 using CR 2.0 process.

2.4.2 Confirmation that destructive fishing practices or controversial unilateral exemptions have not been introduced

No indication was given or suggested during the surveillance audit that these practices are relevant to this fishery.

3 BACKGROUND

3.1 Changes in the management system

3.1.1 Yellow Perch

As reported in LEPMAG 2017c: LEPMAG members are in the process of developing population objectives and harvest strategies for yellow perch in Lake Erie. The objectives and harvest strategies are expected to be completed in the coming years.

3.1.2 Walleye

3.1.3 Lake Whitefish

The understanding of the Lake whitefish population in Lake Erie was substantially improved with the publication of MacDougall *et al* (2016) under the auspices of the Lake Erie Coldwater Task Group.

3.2 Changes in relevant regulations

3.2.1 Yellow Perch

None

3.2.2 Walleye

As reported in the previous annual surveillance report, quota maybe transferred between fishery units. A letter,[2] dated September 13, 2017, confirmed this approach. Data is available on transfers until March 17, 2017.[3]

3.3 Changes to personnel involved in science, management or industry

3.3.1 Yellow Perch & Walleye

In Ohio, Jeff Tyson has been replaced by Travis Hartman as Lake Erie Program Manager for ODNR.

In Michigan, John Syslo was replaced by Mark Dufour who took over MSE work.

These changes will not affect the management system in Ohio.

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[2] To: All Lake Erie Commercial Fishing License Holders

Re: Continuation of pilot project - Inter-basin transfers of Walleye quota in Lake Erie

As many of you are aware, there are ongoing concerns regarding declining Lake Whitefish abundance in Lake Erie. The majority of the harvest of these fish occurs in the fall when they are spawning as bycatch in the Walleye large mesh fishery in Quota Area 1. To reduce this harvest, the allowance of transfers of Walleye between quota areas will continue through 2017. This is being done in order to move Walleye harvest to areas where Whitefish bycatch is not as prevalent. Walleye transfers between quota zones will be permitted in the following manner: 1) from Quota Area 1 to Quota Area 2 or Quota Area 3 2) from Quota Area 2 to Quota Area 3 or vice versa

No Walleye quota may be transferred back into Quota Area 1 under any circumstance.

This pilot project will be reviewed annually by Lake Erie Management Unit and will be discussed at Zone 19 council meetings. It success will be evaluated based on how well it is being utilized (ie fishers are taking advantage of the program) and how well it is being received by commercial fishery and recreational fishery stakeholder groups.

If you have any additional questions or concerns on this matter, please do not hesitate to contact either myself or, Emily Slavik (519-825-4686)

Sincerely

Brian Locke

Manager

[3] From : Quota Zone 1 to Quota Zone 2 293,150 lbs ; Quota Zone 1 to Quota Zone 3 201,659 lbs ; Quota Zone 2 to Quota Zone 3 124,302 lbs ; Quota Zone 3 to Quota Zone 2 204,407 lbs. Total transfer 823,518 lbs. Total transfer out of Quota Zone 1 494,809 lbs Total transfer elsewhere 328,709 lbs. Quota Zone 1 quota after Transfers 3,173,981 lbs.

3.4 Changes to scientific base of information including stock assessments

3.4.1 Yellow Perch

Stock Status

The abundance of yellow perch has generally declined over the recent period, with the extent varying by management unit. This led to the setting of a 2016 lake-wide total allowable catch (TAC) of 9.208 million pounds; a 12.0 % decrease from the previous year.

Although the decline in abundance is reflected in the MU-specific biomass trends, the most recent assessment indicates that three of the MUs in the most recent assessment show an increase (YPTG, 2017), using the YPTG ADMB model as in former years (Figure 1). The 2017 MU-specific age 3+ (mature individuals) biomass was 5.639, 7.722, 8.779 and 0.912 million kg for MUs 1–4, respectively.

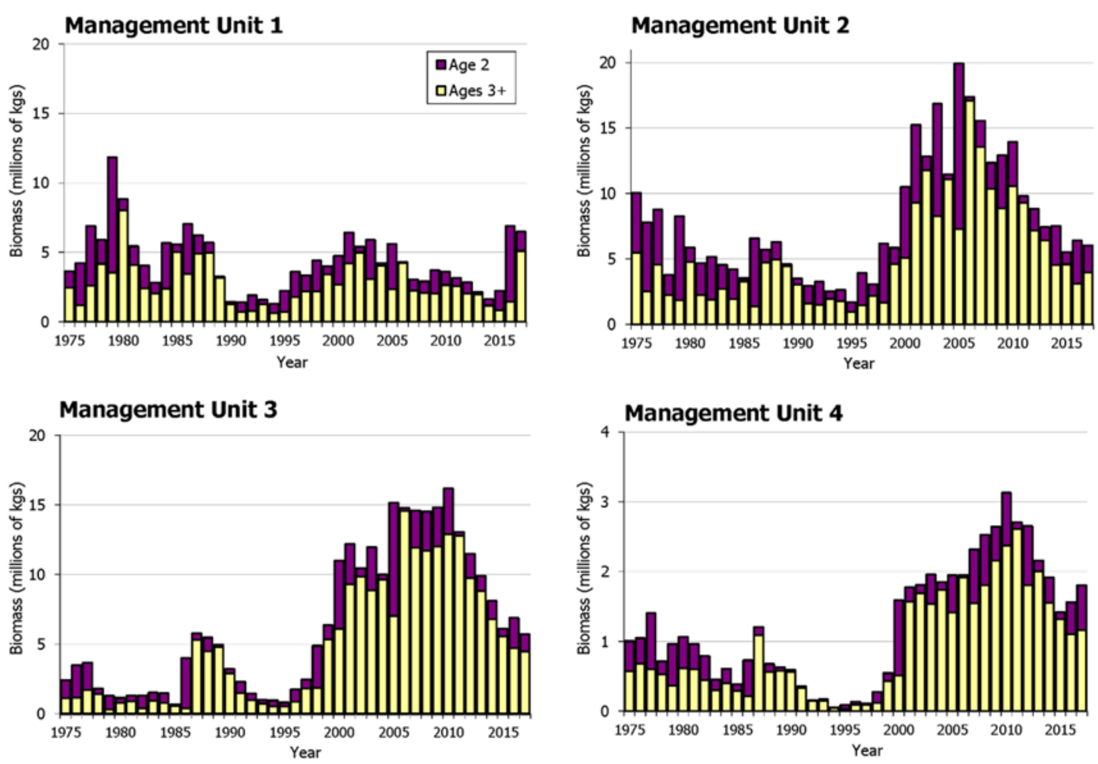

Figure 1. Lake Erie yellow perch biomass (millions kg) estimates by management unit (MU) for age 2 (dark bars) and ages 3+ (light bars). Estimates for 1975–2016 are from the YPTG ADMB model. Estimates for 2017 are projected from the YPTG model and regressions for age 2 from survey gears; from YPTG (2017) – Figure 1.12.a.

The B_{TARGET} and B_{LIM} reference points used in the assessment (Intertek 2015) do not require changing as a consequence of work conducted by the Yellow Perch Task Group (YPTG). The 2017 age 3+ biomass/B_{LIM} ratios for MUs 1–4 are 5.14, 4.56, 9.09, and 3.82, respectively. Thus, SSB remains well above the biomass limits, running in MUs 1–3 approximately 2- to 3-fold higher than in the former year, with MU 4 much the same, 1.90 and 1.88, respectively. In Intertek (2015), these ratios were 0.92, 1.94, 3.68, and 6.24. These trends indicate that while stock status remains good, it has declined in MUs 2–4. In MU 1, stock status is comparable to that described in Intertek (2015) (0.92, 1.94, 3.68, and 6.24 respectively), while in the first surveillance audit (Scott *et al*., 2016), the ratios were 0.94, 0.98, 1.94 and 1.88, respectively. These trends indicate the entire stock status remains good and has increased in all MUs, particularly 1, 2 and 3. In MUs 1–3, the age 3+ biomass/B_{TARGET} ratios have increased considerably compared with 2015 but have decreased in MU4 although it remains broadly the same as the 2016 ratio. This is probably related to the increasingly strong 2014 and, to a lesser extent, 2015 year classes (Figure 2).

There has been an increase in fishing mortality (F) in MUs 1, 3 and 4 and a decrease in MU2 (Figure 3) although in all cases, this is below the 50% F_{MSY} targets established for each. In 2016, the age 3+ F/F_{TARGET} ratios were 0.92, 0.42, 0.43 and 0.81 respectively compared with 0.52, 0.54, 0.37, and 0.58 for MUs 1–4, respectively.

The stock and fishing mortality trends indicate that the original PI 1.1.1 scores remain appropriate. In all MUs, there is a high degree of certainty that biomass remains above B_{LIM}. Except for MU1, there is a high degree of certainty that biomass has been above B_{TARGET} in recent years. For MU1, biomass continues to fluctuate at or around B_{TARGET}. However, the ratio in 2016 was considerably greater – 2.57.

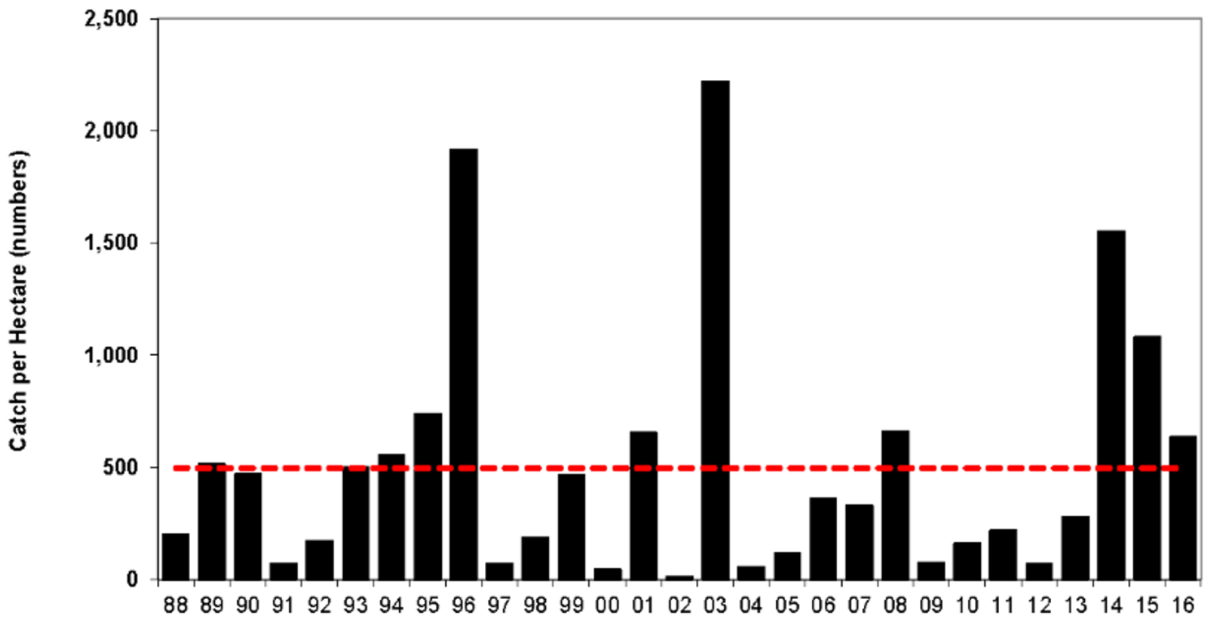

Figure 2. Number of young-of-the-year yellow perch caught per hectare during interagency trawling (1988–2016) in western Lake Erie. Horizontal dashed line indicates 1988–2016 mean catch per hectare; from Lake Erie Management Unit 2017, Draft Report – Figure 4.2.2.

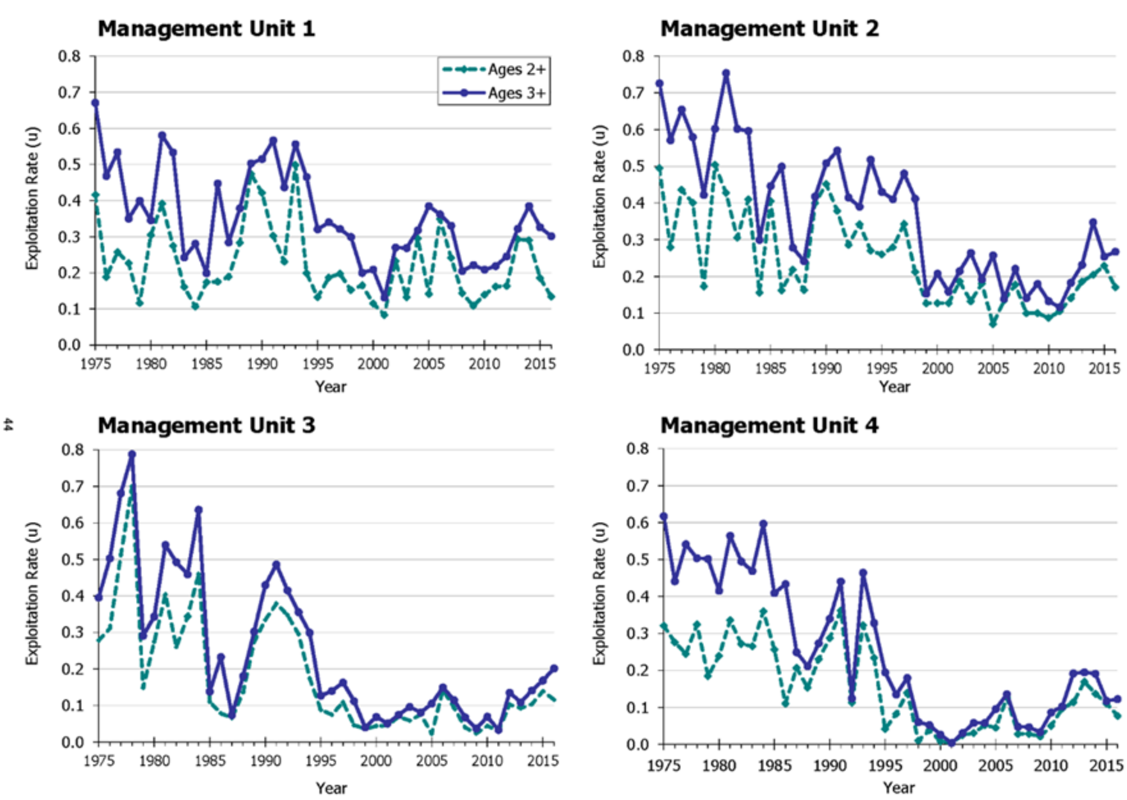

Figure 3. Lake Erie yellow perch exploitation rate (u) estimates by management unit (MU) for ages 2+ (dashed line) and 3+ (solid line). Estimates derived from the YPTG ADMB model; from YPTG (2017) – Figure 1.14.a.

Management

The harvest control rule (HCR) for yellow perch described in Intertek (2015) is used to provide management with values for Recommended Allowable Harvest (RAH). In 2016, the TAC allocations were 2.292, 2.756, 3.776, and 0.384 million pounds for MUs 1 through 4, respectively. In 2016, the Lake Erie Committee (LEC) set the TAC for MU2, MU3 and MU4 higher than the mean RAH values suggested in the March 2016 YPTG report, which were 2.656, 2.408, and 0.259 million pounds, respectively. For MU1, the LEC set the TAC equal to the mean RAH of 2.292 million pounds. For MU3, the LEC set the TAC at 3.776 million pounds, which exceeded the maximum RAH of 3.390 million pounds by approximately 11% and represented a 5% decline from 2015 MU3 TAC of 3.962 million pounds. The LEC chose to exceed the MU3 maximum RAH because of uncertainty regarding the strength of the 2014 year class recruiting in 2016. Such flexibility in following the harvest advice is permitted in the HCR as the TAC is constrained to vary by no more than 20% between years to maintain stability in the harvest. **Future audits must monitor whether this trend continues and if the score for PI 1.2.1 should be reviewed.**

During 2015–2016, LEPMAG, facilitated by Michigan State University's Quantitative Fishery Center (QFC), reviewed the existing YPTG assessment models and data sources and, as part of a yellow perch Management Strategy Evaluation (MSE), has continued discussion on stakeholder objectives. For instance, in July 2016, LEPMAG initiated discussion with stakeholders on the performance metrics (e.g., number of fish per trip, commercial harvest in pounds, SSB), with the associated desired level, to evaluate the performance of the harvest strategy (HS).

It is expected that these discussions will lead to updated assessment models and new harvest exploitation strategies, with a consequent revised Lake Erie Yellow Perch Management Plan (YPMP). Revisions to the assessment models are extensive, as indicated in the next section. A change in staff (Dr. Reilly replaced by Dr. Syslo, recently replaced by Mark Dufour, who has now taken over MSE work) has further impacted the project. As a consequence, progress on the MSE has been slower than anticipated. There was insufficient time to conduct the MSE necessary to institute new reference points or harvest control rules, so the LEC used the existing fishing rates for determining the TACs. Options for limit reference points (LRP) were discussed during the May 2017 meeting of LEPMAG, and the QFC was provided with options for LRPs to be evaluated during the MSE process. Considerable progress is being made, and it is expected that the MU-specific LRPs and new YPMP will likely be implemented in late 2017.

Information

YPTG (2016) provides an update of the statistical catch at age (SCAA) assessment models for MUs 1–4 (see Intertek 2015). The partnership survey catchability estimate in MU4 was revised during 2013–2014 to employ a single time block for the entire survey time series. Previously, MU4 partnership survey catchability was estimated by using two time blocks (because of missing years in the dataset), but this was considered inconsistent with the constant catchability assumption applied in the other MUs. The new approach for MU4 ensures consistency with how partnership survey catchability is estimated in all the models.

In 2014, YPTG implemented a multi-model-inference (MMI) -based approach for predicting age 2 recruitment; this was continued in 2016. In previous assessments (see Intertek 2015), age 2 recruitment was predicted by robust regression of juvenile yellow perch trawl and gill net indices against SCAA estimates of two-year-old abundance in each MU. The MMI approach, developed by QFC during the LEPMAG process, provides a more objective basis for incoming recruitment estimation (YPTG, 2016).

Also in 2014, a Technical Review Panel (TRP) proposed modifications to the yellow perch assessment model – constrained random walk catchability, commercial selectivity time blocks, Ontario survey catchability to account for the break in the time series in MU3 and MU4, multinomial distribution for age composition data, inclusion of additional datasets to the model, incorporation of sexual dimorphism, and expansion of number of age groups used in the model. During 2015–2016, LEPMAG, facilitated by the QFC, has worked to address these recommendations.

In 2015, QFC presented LEPMAG a preliminary length/sex-based SCAA model for MU2 designed to account for sexual dimorphism in growth (females grow faster than males, which may account for sex ratio differences observed in different fishing gears). Diagnostic analyses were performed on three yellow perch SCAA models in MU2 and presented to LEPMAG. Models tested included the sex-based model, the current YPTG model, and an updated YPTG model incorporating a subset of changes made to the WTG walleye model during its revision through the LEPMAG process. Parameter correlations were estimated, residuals were examined, sensitivity analyses were performed, and models were investigated for retrospective patterns.

The current YPTG models exhibit retrospective patterns with stock abundance estimates increasing as data are added to the model, raising concerns on the effect of this pattern on the RAH advice. Many of the model explorations have attempted to reduce the magnitude of this retrospective pattern. The model explorations conducted by QFC indicated that revisions to the YPTG model should include changes in how catchability (random walk) and selectivity (free parameters by age) are estimated, treating the total catch and proportions-at-age as separate datasets (multinomial age composition) and integration of the multi-model indices of age 2 abundance into the assessment model (significantly reduces scale of retrospective pattern). Regarding sex-specific processes, at the 15th meeting of LEPMAG, QFC presented preliminary results from a simulation model designed to examine the potential management importance of using a sex-specific assessment model (YPTG, 2016). These indicate that while the sex-specific model adds biological realism, it is not clear that the additional model complexity results in more robust management advice. During the first surveillance audit site visit, the client noted that while further exploration of this model may be pursued, this would be primarily for research purposes.

The Yellow Perch Task Group (YPTG, 2017) used two ADMB models in each management unit to estimate abundance. The first was the model the YPTG has used in the past (hereafter referred to as the YPTG model; YPTG, 2016), the second was the model developed by the Quantitative Fisheries Center at Michigan State University (hereafter referred to as the Peterson-Reilly or PR model) as part of the ongoing Lake Erie Percid Management Advisory Group (LEPMAG) review of yellow perch management on Lake Erie.

The PR model uses the same data sources as the YPTG model, with the addition of age 0 and age 1 recruitment data. The PR model estimates selectivity for all ages in the fishery and surveys. Since survey selectivities are estimated in this model, Ontario Partnership catch rates are not adjusted for selectivity bias. There is a commercial gill net selectivity block beginning in 1998. Catchabilities for all fisheries and surveys vary as a random walk. The model is fit to total catch and proportions-at-age (multinomial age composition) as separate data sets. Running the PR model is a three-step process. In the first step, an ADMB model without recruitment data is run iteratively until the maximum effective sample size for the multinomial age composition stabilizes. Second, age 2 abundance estimates from the first model are added to age 0 and age 1 recruitment data in a multi-model interference (MMI) R-based glmulti model to determine parameters for estimating recruitment. In the third step, age 0 and age 1 recruitment data are added to the ADMB model, along with the MMI coefficients from step 2. This model is then run iteratively until the maximum-effect sample size for the multinomial age composition stabilizes.

The YPTG recommended using the YPTG model in 2017, as in the past. The results were similar in the two models for MU1, MU2, and MU4 but showed considerable discrepancy for MU3 (PR model, Figure 4; YPTG model, Figure 1). The task group discussed the merits of using the PR model relative to the current YPTG model in terms of model fit and performance presented at LEPMAG meetings (e.g., were the models providing similar abundance estimates, how did each model compare in terms of retrospective pattern, sensitivity to various parameters), and while the task group generally felt the PR models provides advantages relative to the YPTG models, a formal risk assessment (i.e., management strategy evaluation) has yet to be completed for the PR models. The current harvest policy was developed for the existing YPTG assessment models after conducting a stock recruitment simulation to evaluate the risks of various fishing strategies (YPTG, 2010). Further, the YPTG had not had sufficient time to vet the model due to the complex nature of the PR model.

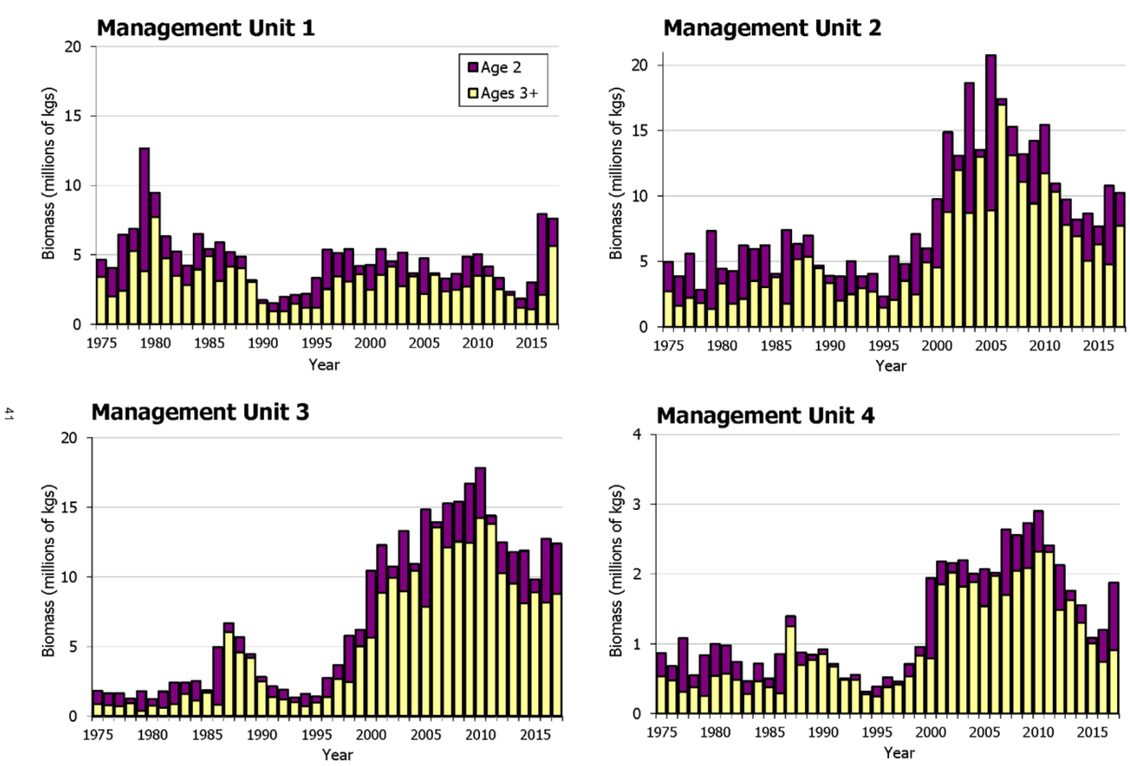

Figure 4. Lake Erie yellow perch biomass (millions kg) estimates by management unit (MU) for age 2 (dark bars) and ages 3+ (light bars). Estimates for 1975–2016 are from the PR ADMB model. Estimates for 2017 are projected from the PR model and regressions for age 2 from survey gears; from YPTG (2017) – Figure 1.12.b.

3.4.2 Walleye

Stock Status

WTG (2017) reports the latest status of the west-central (MUs 1–3) Lake Erie walleye stock, which is the basis of the UoA. Using the SCAA analysis (Intertek 2015), total (age 2+), population numbers in 2016 were scaled upwards across the assessment time series (1980–2016), with changes being the most prominent since the mid-2000s (Scott *et al.,* 2016). Abundance of walleye age 2 and older in the west and central basins of Lake Erie has increased in recent years (Figure 5).

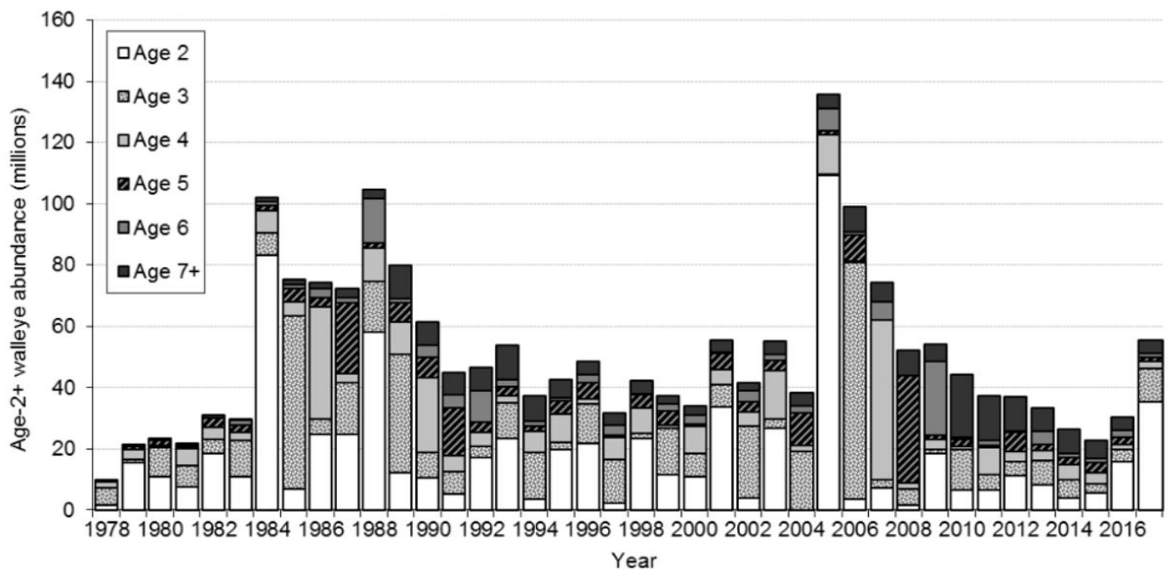

Figure 5. Abundance of walleye age 2 and older in the west and central basins of Lake Erie 1978–2017. Estimated from the 2017 ADMB statistical catch-at-age model; from WTG (2017) – Figure 7 and data from Table 8.

This scaling has resulted in an upward modification of the SSB reference points. For 2016, the SSB_0 was estimated to be 63.865 million kg compared with 42.807 million kg in WTG (2013). Consequently, the 20% SSB_0 (B_{LIM}) reference point has increased from 8.561 million kg in 2013 to 12.773 million kg in 2016. In consequence, the MSC default SSB TRP (40% SSB_0) has also increased, from 17.122 million kg in 2013 to 25.546 million kg in 2016. The estimate for 2017 for SSB_0 was 61.673 million kg and the 20% SSB_0 (B_{LIM}) reference point was 12.335 million kg; the MSC default SSB TRP (40% SSB_0) has decreased slightly, to 24.670 (WTG, 2017). WTG (2017) determined that the probability of the 2017 SSB (37.583 million kg) being less than 20% SSB_0 (B_{LIM}) equalled 0.000%, which is less than the probability determined in 2016 (Pr ($SSB<20\%SSB_0$) = 0.001%). Thus, the probabilistic control rule that could have reduced the target fishing rate to conserve SSB would not be invoked during the 2017 process to determine RAH (WTG, 2017).

The 2017 $SSB/40\%SSB_0$ ratio is estimated to be 1.52, whereas in 2016 it was 1.27. Further, recruitment of the 2015 and 2014 year classes is projected to be relatively strong (Figures 6 and 7), indicating that SSB will continue to increase in the coming years.

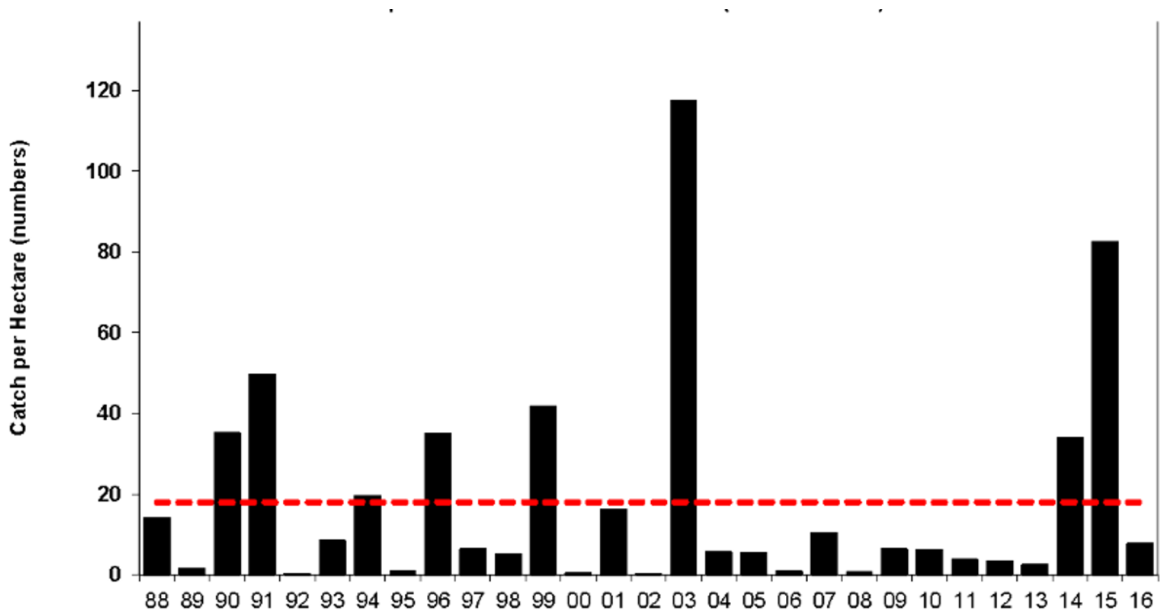

Figure 6. Number of young-of-the-year walleye caught per hectare during interagency trawling (1988–2016) in western Lake Erie. Horizontal dashed line indicates 1988–2016 mean catch per hectare; from Lake Erie Management Unit 2017, Draft Report – Figure 4.2.5.

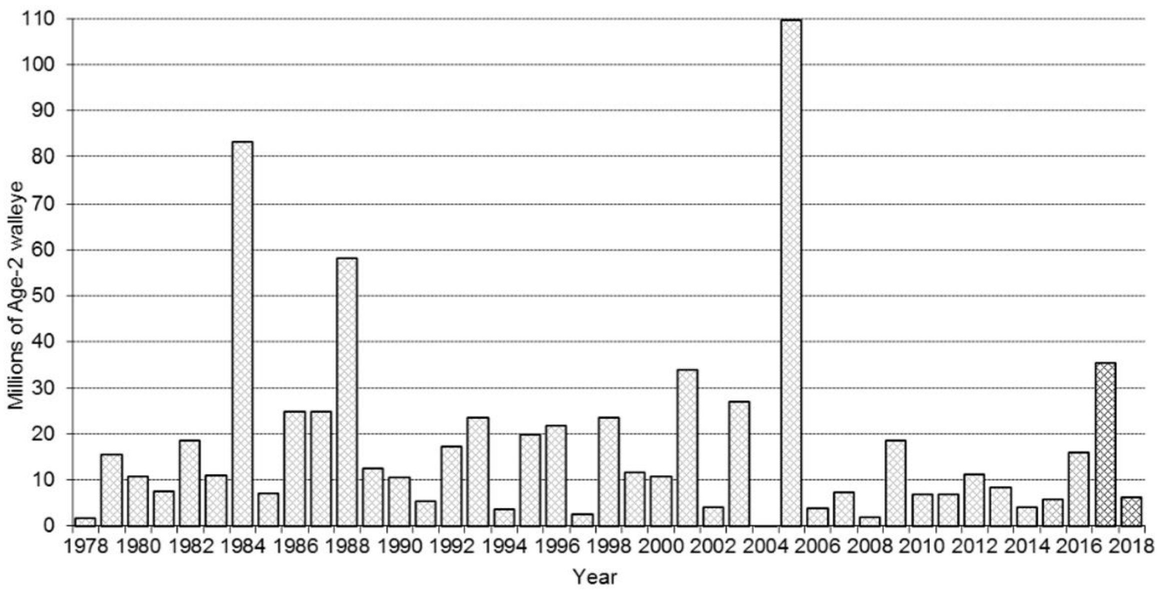

Figure 7. Estimated (1978–2016) and projected (2017 and 2018) number of age 2 walleye in the west-central Lake Erie population during 1978–2017, using the 2017 ADMB statistical catch-at-age model; from WTG (2017) – Figure 8.

F_{MSY} decreased in 2017 compared to the 2016 assessment, from 0.530 (WTG, 2017) to 0.481 (WTG, 2016). Therefore, the 60% F_{MSY} target fishing mortality has also decreased modestly, from 0.318 to 0.289 (Intertek, 2015). On the other hand, age 2+ fishing mortality has decreased across the assessment time series, although with an increasing trend from 2011 to 2016 (Figure 8) and decreasing slightly in 2017. Nevertheless, in 2016 fishing mortality / 60%F_{MSY} ratio was 0.336, the same as in 2015. During the site visit, in response to the question concerning the cause of the recent decrease in fishing mortality, the client suggested that it was related to the harvest control rules and industry consolidation.

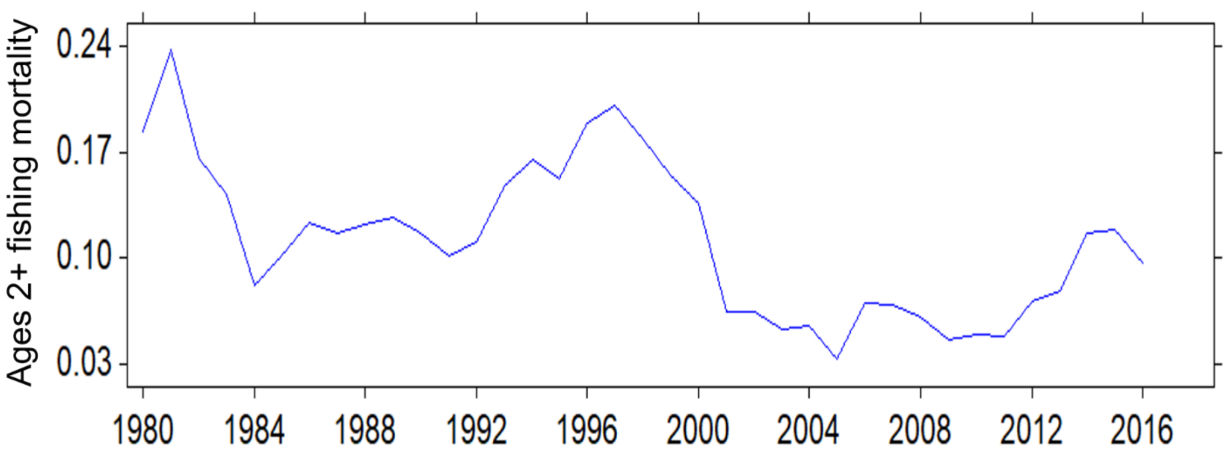

Figure 8. Comparison of walleye ages 2+ Lake Erie west-central fishing mortality (F) assessed by the Walleye Task Group, 2017; data from respective assessments; from WTG (2017) – from Table 8.

Overall, the most recent assessment (WTG, 2017) indicates a very modest decrease in stock status, with SSB well above B_{LIM} and at or above B_{TARGET}. Even though fishing mortality appeared to have been increasing since 2011, with a slight decrease in 2017 (Figure 8), it is still well below the target of the management plan.

Management

The HCR described in Intertek (2015) has been incorporated into the 2015-2019 walleye management plan (WMP, 2015) and is no longer considered as interim. Informed by the assessment analysis, it was the basis of harvest advice for 2016 and 2017.

The 2015–2019 walleye management plan (WMP, 2015), which was published after the MSC assessment (Intertek, 2015), is a significant revision of the original plan (2005). The new plan outlines the management structure, fishery objectives and the on-going Harvest Strategy. The strategy was based on significant effort on a Management Strategy Evaluation prior to release of the plan. The MSE and WMP greatly benefited from stakeholder input during development which this will continue. The WMP also includes an ongoing review process with a full evaluation of plan performance scheduled for the end of the plan cycle (2019).

Information

The most recent assessment (WTG, 2017) updated the previous SCAA analyses (Intertek 2015) with no major changes. During the site visit of the first surveillance audit (Scott et al., 2016), the client noted that a retrospective pattern like the one observed in the yellow perch assessments has become evident. This will no doubt be explored when the plan is updated in 2019.

WTG (2017) reports on several studies to improve future stock assessments, including:

- **Investigating Auxiliary Recruitment Indices**. There is scientific evidence of multiple walleye stocks in Lake Erie, with decreasing stock productivity from west to east. Adult walleye appear to migrate from west basin spawning grounds in the spring, to the cooler eastern waters in the summer, and then return to the west basin in late fall. While juvenile walleye from both west or eastern basin are believed to disperse from natal basins during the summer and fall, it is unknown if they display similar migrations to those observed of adults. To address uncertainty surrounding juvenile dispersal and productivity of walleye stocks across Lake Erie, the WTG has reported basin-specific densities of yearling walleye with standardized gill net indices since 2011.

  Currently, the young-of-the-year (YOY) index from the interagency west basin bottom trawl survey is integrated into the SCAA model to estimate age 2 abundance and forecast recruitment. While the interagency bottom trawl survey is considered to be a robust recruitment predictor, inclusion of additional YOY and yearling indices to form a composite 6 recruitment index could supplement recruitment estimates. However, there are a couple of factors limiting the integration of a composite recruitment index into the SCAA model.

  First, yearling indices are not available far enough in advance to forecast age 2 recruitment, as required for the probabilistic harvest control rule (P*) of the current Walleye Management Plan. It is important to note that the two SCAA model option could result in conflicting abundance estimates.

  The second issue is the spatial and temporal variability in walleye YOY and yearling indices with gear type (bottom set vs. suspended gill nets), along with inconsistencies in sampling intensity and effort. Principal Components Analysis (PCA) of the available recruitment indices revealed challenges for integrating a composite recruitment index into the SCAA model (WTG 2016). Data transformations and missing years of data in some indices were primary concerns. The 2016 change in ODNR index gill net configuration represents another challenge as a correction factor for the new monofilament from the historical multifilament gill net has yet to be derived for this spatially and temporally extensive survey.

  The WTG will continue working on auxiliary recruitment indices. The task group will continue to explore and evaluate alternative recruitment estimation approaches to be considered for adoption in future Lake Erie Walleye Management Plans.

- **Explore ways to account for tag loss and non-reporting in natural mortality (M).** The Quantitative Fisheries Center at Michigan State University, has been developing methods for estimating natural mortality, using acoustic telemetry to evaluate mortality of adult walleye. Unlike other methods for estimating mortality, acoustic tags are internal and do not require recapture and reporting by a fishery to acquire data for estimating mortality components and movements of walleye from acoustic telemetry data, then use this approach to estimate mortality components for different walleye spawning populations. To date a simulation framework has been used to evaluate different analytical approaches (both a spatial and non-spatial models) under different fisheries scenarios including different 'true' mortality rates and different configurations of acoustic receiver deployments (e.g. grids versus gates). Future work includes model diagnostics and sensitivity analysis to different fish movement scenarios. In addition to acoustic tagging research, interagency efforts to estimate natural mortality using jaw and tags continue. Preliminary results for this work suggest a natural mortality rate of 0.29 with instantaneous fishing mortality rates ranging from 0.09 to 0.32 for west/central stocks. Future comparisons should be possible among the different methods for estimating natural mortality.

- **East Basin Walleye Assessment**. Many studies have shown the walleye resource in the east basin during harvest season is a mixture of walleye sub-populations from both west basin and east basin. It is estimated that, on average, about 90% of all walleye harvested in the east basin were seasonal migrants from the west basin. There is a large degree of uncertainty and variability associated with the annual age and size structure of the walleye population migrating from the west.

  Some of the rationale for spatially investigating relative abundance of yearling walleye (**Investigating Auxiliary Recruitment Indices,** above) was to better understand the relative annual eastern stock specific abundance, based on the assumption that yearling walleye have moved little beyond their basin of production. Ongoing work toward improved gear standardization will also contribute to describing and assessing eastern production independent of western. Apparent from that exercise is the potential for intra-basin differences in eastern production, perhaps related to unique characteristics of local stocks. Assumptions based on movement patterns, and site fidelity, will also be informed in the future by ongoing, lake wide, spatial ecology studies (**Studies Using Acoustic Telemetry**; below).

The WTG member agencies from the east basin continue assessment surveys to track changes in the abundance of the walleye population. The task group is optimistic that ongoing eastern basin-specific additions to the Lake Erie Walleye Acoustic Telemetry Studies (below) will contribute substantially to incorporating the east basin into the lake-wide walleye management structure.

- Studies Using Acoustic Telemetry. In 2010, an inter-lake walleye spatial ecology study was initiated between the Michigan Department of Natural Resources, Ohio Department of Natural Resources, United States Geological Survey, Carleton University, and Great Lakes Fishery Commission.

  The objectives of the study were to: 1) determine the proportion of walleye originating from two western basin spawning stocks (i.e., Toussaint Reef and Maumee River) that migrate out of the western basin of Lake Erie after spawning, 2) compare spawning site fidelity rates between these two spawning stocks, 3) determine if female walleye from these spawning stocks are annual spawners, and 4) compare total mortality rates (i.e., fishing and natural) for these spawning stocks.

  The broad goal of the work was to address areas of uncertainty that prevent the inclusion of the eastern basin in a multi-jurisdictional assessment. The objectives of the study were to: 1) estimate the annual contribution of western basin walleye to the eastern basin fishery, 2) quantify the timing, magnitude, demographics, and spatial distribution of central and western basin migrants in the eastern basin, 3) estimate and compare spawning site fidelity rates in the eastern basin, 4) describe the movements of eastern basin walleye out of the eastern basin, and 5) estimate total mortality rates (i.e., fishing and natural) for the major spawning stocks in the eastern basin.

  Considerable progress has been made on these objectives (WTG, 2017). Results from these telemetry studies will be forthcoming during the coming years.

4 RESULTS

4.1 Condition YP1

PI & Score	PI	Scoring issues / Scoring Guidepost Text	Score
	1.1.2	Issues at SG80 a. Reference points are appropriate for the stock and can be estimated. b. The limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity. c. The target reference point is such that the stock is maintained at a level consistent with BMSY or some measure or surrogate with similar intent or outcome.	75
Justification	Issue b. While there is an explicit target fishing mortality, implying a target biomass reference point, this is not the case for a biomass limit reference point. There is not an explicitly recognized biomass LRP.		
Condition	By the third annual surveillance audit, the following SG80 SIs must be met: A limit reference point is set above the level at which there is an appreciable risk of impairing reproductive capacity.		
Milestones	At the first annual audit, the client will present the CAB with evidence that there has been consideration of the options for a limit reference point that is appropriate for the stock. The required minimum score is 75. At the second annual audit, the client will present the CAB with evidence that the required limit reference point has been defined and accepted by LEC. The required minimum score is 75. At the third annual audit, the client will present the CAB with evidence to show that the limit reference point has been explicitly incorporated into advice on the annual TAC. The required minimum score is 80.		
Client action plan	LEPMAG is currently working toward the development of a lake wide management approach and plan for Lake Erie Yellow perch that will include both TRP and LRP. This will occur over the next two years, and will satisfy this condition. The on-going LEPMAG process will provide a full MSE for Lake Erie yellow perch in support of a LEC Yellow perch management plan expected by late 2016 or early 2017. LEMPAG and the QFC/LEC have already begun to consider options for LRP and TRP for all MUs. These options will be presented to the CAB at the first annual audit. The MSE process will be completed by the third annual audit and the LEC's final decision(s) on TRPs, LRPs, and SSB_0 will be available to the CAB at that time. By 2017, the LEC decisions on HCRs will be used by the YPTG to generate RAH advice to the LEC on the annual TACs for all MUs. A new Yellow perch management plan will be available in late 2016 or early 2017.		
Progress on Condition [2016]	The milestone of the 1st surveillance audit is for the client to provide evidence that there has been consideration of the options for a LRP that is appropriate for the stocks. Extensive revisions to the MU 1 – 4 stock assessment models have been the focus of discussion by LEPMAG (facilitated by QFC) since 2014 and will not be complete, at least for MUs 1 – 3, until early 2017. Consideration of LRPs before the conclusion of these discussions would be premature. The client reported that completion of deliberations on MSE is planned for mid-2017 during which LRP options would be considered. The MU-specific		

	LRPs and the new YPMP would likely be implemented in late 2017.
Status of condition [2016]	**Progress on this condition is behind schedule.** If completion of the MSE deliberations takes place as planned in mid-2017 and before the 2nd surveillance audit, the 1st and 2nd milestones will be met. If the new YPMP is implemented in late 2017, the 3rd milestone will be met, and the condition would be closed. At this stage, we do not consider it necessary to change the milestone schedule.
Progress on Condition [2017]	The milestone of the 2nd surveillance audit is for the client to provide the CAB with evidence that the required limit reference point has been defined and accepted by LEC. Extensive revisions to the MU 1 – 4 stock assessment models have been the focus of discussion by LEPMAG (facilitated by QFC) since 2014. Although this condition has always been challenging, considerable progress has been made. Yellow perch stock assessment models have been developed by the QFC (see yellow perch stock status information section in this surveillance report). As indicated, although an alternative model has been developed, there has not been adequate time to properly conduct a formal risk assessment and a complete evaluation, so it was not used in the 2017 stock assessment and TAC setting process. The original timeframe set out for this extensive condition was no doubt optimistic. There was inadequate time to conduct the MSE necessary to institute new reference points or HCRs for 2017, so the LEC used the existing fishing rates to determine the 2017 TACs. Consideration of LRPs before these discussions would be premature. However, options for the LTPs were discussed during the May 2017 meeting with the LEPMAG in Windsor, ON. The QFC was provided with options for the LRPs to be evaluated during the MSE process, which is underway but delayed, as the client indicated, primarily because of QFC staff changes. Performance commercial fish measures for the MSE were provided to the QFC in May 2017. The QFC has informed the client that they are in the process of running MSE simulations for yellow perch for all the management units and expect to have results in late 2017. All parties appreciate the importance of giving stakeholders the opportunity to share concerns and deliberate alternative technical options. This takes considerable time.
Status of condition [2017]	**Progress on this condition is behind schedule.** This audit finds that considerable progress has been made on a very complicated topic and condition, which should not, at this time, affect certification. Indeed, if the new yellow perch management plan is implemented in 2017, the 3rd milestone will be met and the condition would be closed. **Given the complexity of this condition in the context of the management processes involved, we consider that the original milestone schedule was unduly optimistic with insufficient time to fully meet the condition and allow PI 1.1.2 to be rescored to meet 80. On that basis, and as allowed under MSC CR V2.0 Para 17.23.13.1b fulfilment of the audit should be extended to the 4th audit.** The revised milestones are. At the third annual audit, the client will present the CAB with evidence that the required limit reference point has been defined and accepted by LEC. The required minimum score is 75. At the fourth annual audit, the client will present the CAB with evidence to show that the limit reference point has been explicitly incorporated into advice on the annual TAC. The required minimum score is 80.

4.2 Condition YP2

PI & Score	PI	Scoring issues / Scoring Guidepost Text	Score
	1.2.2	Issues at SG80 a. Well-defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached. b. The selection of the harvest control rules takes into account the main uncertainties. c. Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the harvest control rules	75
Justification	Issue a. The HCR does not make explicit reference to an LRP and it is unclear what actions will be taken as the MSC default LRP of 20% SSB_0 is approached.		
Condition	By the fourth annual surveillance audit, the following SG80 SI must be met: Well-defined harvest control rules are in place that are consistent with the harvest strategy and ensure that the exploitation rate is reduced as limit reference points are approached.		
Milestones	At the first annual audit, the client will present the CAB with evidence that there has been consideration of the options for an explicit algorithm or a decision rule which links observed changes in indicators to changes in annual TACs. The required minimum score is 75. At the second annual audit, the client will present the CAB with evidence that the explicit algorithm or decision rule which links observed changes in indicators to changes in annual TACs has been proposed. The required minimum score is 75. At the third annual audit, the client will present the CAB with evidence that the explicit algorithm or decision rule which links observed changes in indicators to changes in annual TACs has been defined. The required minimum score is 75. At the fourth annual, audit the client will present the CAB with evidence to show that explicit algorithm or decision rule which links observed changes in indicators to changes in annual TACs has been implemented and used in determining the TAC for the following year. The required minimum score is 80.		
Client action plan	LEPMAG is currently working toward the development of a lake wide management approach and plan for Lake Erie Yellow perch that will include both TRP and LRP. This will occur over the next two to three years, and will satisfy this condition. The on-going LEPMAG process will provide a full MSE for Lake Erie Yellow perch in support of the evaluation of alternative HCRs and a LEC Yellow perch FMP is expected by late 2016 or early 2017. LEMPAG and QFC/LEC have already begun to consider options for state-dependent HCRs for all QZs and MUs. These options will be presented to the CAB at the first annual audit. The MSE process should be completed by the second annual audit and LEC's final decision(s) on HCRs will be available to the CAB at that time. By 2017, the LEC decisions on HCRs will be used by YPTG to generate RAH advice to LEC on the annual TACs for all MUs. A new Yellow perch FMP will be available in late 2016 or early 2017.		
Progress on Condition [2016]	The milestone of the 1st surveillance audit is for the client to provide evidence that there has been consideration of the options of an explicit algorithm or a decision rule which links observed changes in indicators to changes in annual TACs. As indicated in the justification of the condition, the current HCR does not make explicit reference to an LRP and it is unclear what actions will be taken as the MSC default LRP of 20% SSB_0 is approached. Extensive		

	revisions to the MU 1 – 4 stock assessment models have been the focus of discussion by LEPMAG (facilitated by QFC) since 2014 and will not be complete, at least for MUs 1 – 3, until early 2017. Consideration of new HCRs before the conclusion of these discussions would be premature. The client reported that completion of the MSE deliberations is planned for mid-2017 at which time HCR options would be considered. The MU-specific HCRs and new YPMP will likely be implemented in late 2017.
Status of condition [2016]	**Progress on this condition is behind schedule.** If completion of the MSE deliberations takes place as planned in mid-2017 and before the 2nd surveillance audit, the 1st and 2nd milestones will be met. If the new YPMP is implemented in late 2017, the 3rd and possibly 4th milestones will be met, closing the condition ahead of schedule. At this stage, we do not consider it necessary to change the milestone schedule.
Progress on Condition [2017]	The milestone of the 2nd surveillance audit is for the client to provide the CAB with evidence that an explicit algorithm or decision rule has been proposed, which links observed changes in indicators to changes in the annual TACs. As indicated in the justification of the condition, the current HCR does not make explicit reference to an LRP and it is unclear what actions will be taken as the MSC default LRP of 20% SSB_0 is approached. Extensive revisions to the MU 1 – 4 stock assessment models have been the focus of discussion by LEPMAG (facilitated by QFC) since 2014. By this 2nd surveillance audit, the MSE process was to be completed and the LECs final decision on the HCRs would be available. Also, by 2017, the LEC decisions on the HCRs would be used by the Yellow Perch Task Group to generate RAH advice to the LAC on the annual TACs for all MUs. However, as indicated in condition YP1, as mutually affects YP2, extensive revisions to the MU 1 – 4 stock assessment models have been the focus of discussion by LEPMAG (facilitated by QFC) since 2014. Although this condition is extensive and builds on conditions associated with YP1, progress has been made. Yellow perch stock assessment models have been developed by the QFC (see yellow perch stock status information section in this surveillance report). As indicated, although an alternative model has been developed, there has not been adequate time to properly conduct a formal risk assessment and a complete evaluation, so it was not used in the 2017 stock assessment and TAC setting process. The original timeframe set out for this extensive condition was no doubt optimistic. There was inadequate time to conduct the MSE necessary to institute new HCRs for 2017, so the LEC used the existing fishing rates to determine the 2017 TACs. Consideration of new HSRs before the conclusion of these discussions would be premature. However, options for the HCRs were discussed during the May 2017 meeting with the LEPMAG in Windsor, ON. The QFC was provided with options for the HCRs to be evaluated during the MSE process, which is underway but delayed, as the client indicated, primarily because of QFC staff changes. Performance commercial fish measures for the MSE were provided to the QFC in May 2017. The QFC has informed the client that they are in the process of running MSE simulations for yellow perch for all the management units and expect to have results in late 2017. All parties appreciate the importance of giving stakeholders the opportunity to share concerns and deliberate alternative technical options. This takes considerable time.
Status of condition [2017]	**Progress on this condition is behind schedule.** **Given the complexity of this condition in the context of the management processes involved, we consider that the originally defined milestones for year 1 and year 2 were unduly optimistic and did not take into account the management process. On that basis, and as allowed under MSC CR V2.0 Para 17.23.13.1b, the milestone for year 2 should be applied to year 3 while being modified to take into account the previously defined Year 3 milestone. The original milestone for Year 4 should be retained.** At the third annual audit, the client will present the CAB with evidence that the explicit algorithm or decision rule which links observed changes in indicators to changes in annual TACs has been proposed and defined. The required minimum score is 75.

	At the fourth annual, audit the client will present the CAB with evidence to show that explicit algorithm or decision rule which links observed changes in indicators to changes in annual TACs has been implemented and used in determining the TAC for the following year. The required minimum score is 80.

4.3 Condition YP3- MU1

PI & Score	PI	Scoring issues / Scoring Guidepost Text	Score
	2.1.2	Issues at SG80 a. There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding. b. There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved. c. There is some evidence that the partial strategy is being implemented successfully (*please note that an error in drafting in the previous surveillance report has been corrected*).	60
Justification	a. While there is a minimum landing size Channel catfish (14.5”), specific measures have not been defined for Freshwater drum. b. Channel catfish. Although there is partial strategy of minimum landing size and other measures, this is unlikely to work as there is not a catch limit. Harvest is not constrained by the quota for Yellow perch quota as the fish can be released when the quota is reached. While the measures may work and the fishery meets SG60 SIb, the lack of catch limits fails to provide an objective basis for confidence that the partial strategy will work. Freshwater drum. There are measures but not a partial strategy. c. The lack of a catch limit for Channel catfish means that the partial strategy of a minimum size and other measures is unlikely to work. A partial strategy has not been implemented for Freshwater drum.		
Condition	The main retained species in MU1 are channel catfish and freshwater drum; White perch is an invasive species and not considered in the conditions. By the fourth annual surveillance audit, the following SG80 SIs must be met: There shall be a partial strategy that is expected to maintain all main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding. There shall be some objective basis for confidence that the partial strategy for all main retained species will work, based on some information directly about the fishery and/or species involved. There shall be some evidence that the partial strategy is being implemented successfully (*please note that an error in drafting in the previous surveillance report has been corrected*).		
Milestones	At the first annual audit, the client will present the CAB with evidence that options to strengthen the approach to management of all identified main retained species have been identified. The required minimum score is 60. At the second annual audit, the client will present the CAB with evidence that options to strengthen the approach to management of all identified main retained species have been analyzed. The required minimum score is 60. At the third annual audit, the client will present the CAB with evidence that options to strengthen the approach to management of all identified main retained species have been identified with partial strategies for all main retained species incorporated into relevant management plans. The required minimum score is 60. At the fourth annual, audit the client will present the CAB with evidence to show that the implemented strategies will work. The required minimum score is 80.		

Client action plan	At the first annual audit, the client will present the CAB with evidence that options to strengthen the approach to management of all identified main retained species have been identified. At the second annual audit, the client will present the CAB with evidence that options to strengthen the approach to management of all identified main retained species have been analyzed. At the third annual audit, the client will present the CAB with evidence that options to strengthen the approach to management of all identified main retained species have been identified with partial strategies for all main retained species incorporated into relevant management plans. At the fourth annual, audit the client will present the CAB with evidence to show that the implemented strategies will work. The above provides incremental steps in achieving the condition. Only when the final step is complete will the team be able to provide a revised score. By the fourth audit the required minimum score is 80.
Progress on Condition [2016]	The client presented the CAB with information to show that steps had been taken to organize a group of experts to address, *inter alia*, the management of the main retained species of channel catfish and freshwater drum. LEC has established a data deficient fisheries working group (DDFWG) to commence projects focused on development of partial strategies for channel catfish and freshwater drum. DDFWG had met (conference calls) twice since its formation (until end-August 2016). The lead biologist of the LEMU, Rich Drouin, met with the client and a post-doc (Fan Zhang) to discuss integration with work of DDFWG. To-date, DDFWG has concentrated on lake whitefish and white bass; the options to strengthen the approach to management of channel catfish and freshwater drum remain to be identified.
Status of condition [2016]	**Progress on this condition is behind schedule.** If evidence to show that the options to develop harvest strategies for channel catfish and freshwater drum have been identified and analysed is available at the 2nd surveillance audit, the Year 1 and Year 2 milestones will have been met.
Client Submission (2017)	The client pre-audit submission was: • The LEC formed a data-deficient fishery working group (DDFWG) in 2016 to commence projects focused on development of partial strategies for Channel Catfish and Freshwater Drum • The DDFWG has collectively completed Productivity Susceptibility Analyses (PSAs) for Channel Catfish and Freshwater Drum (Table 7). • The results of the PSAs show that the risk imposed on sustainability of both Channel Catfish and Freshwater Drum by the MU1 Yellow perch trap net fishery is very low with MSC scores > 90 in both cases. • Fishery independent data show the abundance of both species to be high in recent years (see: DDW_status of CC and FWD.pdf) • Based on this result the client suggests that partial strategies are not necessary to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the MU1 Yellow Perch trap net fishery does not hinder their recovery and rebuilding. • Documentation provided: Results of PSA for Channel Catfish and supporting files; Results of PSA for Freshwater Drum and supporting files • Schedule for meeting milestones: Milestones no longer applicable as the partial strategies are not deemed necessary.
Progress on Condition [2017]	1. This condition relates to the retained catch in the yellow perch trap net fishery operating in MU1. 2. As defined in MSC CR 1.3 , CR 2.0 a "*partial strategy represents a cohesive arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and an awareness of the need to change the measures should they cease to be effective. It may not have been designed to manage the impact on that component specifically*".

	3. As defined in MSC CR 1.3 The team should interpret the term "if necessary" used in the management strategy PIs at SG60 and SG80 for the retained species, byctch species, habitats and ecosystems components to be applicable to those fisheries that have no impact on the relevant component and where no management strategy is required. If a team determines that a fishery has no impact on a component and has therefore score 100 under the Outcome PI, the Management Strategy PI shall still be scored. Similarly, in CR 2.0, "*the term "if necessary" is used in the management strategy PIs at SG60 and SG80 for the primary species, secondary species, habitats and ecosystems components. This is to exclude the assessment of UoAs that do not impact the relevant component at these SG levels*". 4. As defined in MSC CR 2.0 "*GSA3.5.1 'If necessary' If the UoA has no (or negligible: see below) impact on this component, scoring issue (a) does not need to be scored for SG60 and SG80 (see definition of "if necessary" in Table GSA3 and Table GSA2*". Table GSA3 establishes that "If necessary" is inserted in some Management PI scoring issues to indicate that if the UoA does not have any impact on a certain component (e.g., species), then no specific rationale need be given to achieve the relevant SG level. For example, if there are no "main" primary species, then a management strategy would not be required at SG60 or SG80. "If necessary" does not appear in the Management PI scoring issue (a) at SG100, meaning that to score 100 a management strategy should be in place even if there is no interaction of the UoA with that component. Table GSA2 defines the components of Principle 2 (Primary, Secondary and ETP, Habitats and Ecosystem). This was clarified by MSC (email of 25/09/17 from Acoura[4]) a fishery that does not have an impact or has a negligible impact does not need to have measures or partial strategy. 5. As defined in MSC CR 2.0 GSA3.4.6 "*MSC allows that the UoA's catch in proportion to the total catch of a stock may be used as a reasonable proxy of whether that UoA on its own or cumulatively with other UoAs, could be considered to be hindering recovery. To illustrate this approach, even if the total catch of a species is clearly hindering recovery, UoA catches of less than 30% of the total catch of a species may not normally be influential in hindering a recovery in a marginal sense, i.e., nothing the UoA does would be likely to change the situation. On the other hand, catches of more than 30% might be influential, such that if the UoA took action to reduce its catches, the stock might well start to recover. A judgement on whether the UoA is hindering recovery will depend not only on the proportion of catch, but on the overall level of F that is causing the problem*". 6. Two species (channel catfish and freshwater drum) were identified as "main retained" in the original assessment report (Scott *et al* 2015). The findings were based on data from 2009 up to 2013. However, the MU1 commercial fishery was open for only 2 of the 5 years in the period (2010 and 2011). In Ohio, preference is given to the interests of sports fishers who get priority in quota allocation in MU1 according to historical data in the context of the available annual quota. Shares of yellow perch for Ohio's commercial fisheries are determined, as guided by Division of Wildlife Policy #2, and guidance from the Ohio Lake Erie Fishing Regulatory Reform Task Force based upon the remaining quota after allocation to the sport fishery in each of the management units. Once the total quota for MU1 goes above an established level of around 800,000 lbs, the commercial fishery is opened.

[4] **Question:** Does the 'if necessary' clause in scoring issue (a) of PIs 2.1.2, 2.2.2, 2.4.2 and 2.5.2 mean that it applies to scoring issues (b) and (c), which refer back to the measures or partial strategy? i.e. If measures or partial strategy are not needed because there is no or negligible impact on the specific component, do you still need to score the SG60 and SG80 for 'management strategy evaluation' and 'management strategy implementation'?

Answer: Although it is not specified in the requirements, the MSC's intent is that the 'if necessary' in scoring issue (a) also pertains to scoring issues (b) and (c). If the fishery does not need to have measures or partial strategy because there is no or negligible impact on Primary, Secondary, Habitats or Ecosystem components, it would meet at least the SG80 level in scoring issues a-c. However, additional scoring issues like shark finning, unwanted catch or compliance with management requirements for VMEs would still need to be scored at all levels if they apply (the shark finning scoring issue is only scored if there is a secondary species that is a shark, as indicated by the curly brackets and confirmed in the guidance).

	7. ODNR (2017) up-dates activity in the fishery (Table 7). In 2016, the yellow perch commercial catch in MU1 was 103,000 lbs out of a total MU1 catch of 886,000 lbs and a total quota of 1,153,000 pounds. 8. ODNR (2017) provides data on total catch by species in 2016. The total catch of freshwater drum in Ohio waters was 693,317 lbs, with a respective quantity of channel catfish of 410,095 lbs. The data identifies the source of the catch: (i) between commercial and sports fishing; with the latter providing a small proportion of the catch of the two species; and (ii) between trap net and seine and trotline. In 2016 traps nets caught: (i) less than 25 % (160,314 lbs) of the total commercial catch (659,410 lbs) of freshwater drum in MU1; and (ii) about 40 % (141,416 lbs) of the total commercial catch (341,581 lbs) of channel catfish in MU1. These numbers do not include bycatch. 9. The total commercial catch of yellow perch in MU1 in 2016 by small mesh trap net was 103,345 which was the only gear used to target the species. For arguments sake, let's assume that the bycatch of freshwater drum and channel catfish were the same as 2010 (6.66% and 15.77 % respectively) with the 2010 catch of yellow perch being 61.27 % of the total trap net catch in the yellow perch directed fishery. 10. This indicates that the total 2016 trap net catch in the yellow perch directed fishery was 168,671 lbs, with the respective estimated quantities of freshwater drum and channel catfish being 11,233 lbs and 26,600 lbs. 11. For freshwater drum, the amount taken as by catch in the yellow perch trap fishery would represent 1.6 % of the total catch of the species in Ohio waters. The respective proportion for channel catfish is 6.5 %. Clearly as a proportion of the total retained catch of the two species in Lake Erie, the take in the MU1 directed trap net fishery for yellow perch could be significantly less. 12. In the scoring rationale for PI 2.1.1, the initial assessment (Scott *et al* 2015) stated: "*Channel catfish is highly likely to be within biological limits*" and for freshwater drum "*interagency fishery independent surveys tend to indicate that harvest declines are independent of abundance for which they have documented a slight increase; primarily in the western basin and in the warmer waters of the central basin. The species may have experienced increased M due to outbreaks of disease. The fishery meets SG60 & SG80 Sia*". 13. Catch data for Ohio waters (table 9) (ODNR 2017) indicate that the mean annual catch between 2007 and 2016 for channel catfish was 427,044 lbs. The annual catches for the last 3 years were below this mean but were not the lowest in the time series (2007). The mean annual catch of freshwater drum in the same period was 495,716 lbs. Catches recorded in 2015 and 2016 were substantially above that level. 14. The client completed a PSA for both species (tables 10 - 14). This provides evidence that in overall terms there is a low risk of the two species being overfished, and supports the argument that their limited catch in the directed trap fishery for yellow perch would have limited impact on their sustainability. Nevertheless, this argument alone does not lead to the conclusion that there is no impact or negligible impact of the fishery on the two species.
Status of condition [2017]	New evidence is available that indicates that the fishery does not impact the main retained species and a partial strategy is not required. **This indicates that the client is on-target but the situation must be formalised.** Following MSC CR V2.0 7.23.13.3, the condition is revised. At the third annual audit, the client will present the CAB with evidence that the impact of the fishery on main retained species is negligible and that a partial strategy is not required. This evidence will allow revision of the scoring rationale at the third surveillance audit. Expected score = 80.

Table 4: Yellow Perch: Ohio – TAC & Harvest by Fishing Segment 1996 -2016

Table 5.0.7. Ohio's yellow perch TAC, commercial harvest, sport harvest, and combined harvest (millions of pounds), by Management Unit (MU) .

	Ohio's TAC			Ohio's Commercial Harvest			Ohio's Sport Harvest			Ohio's Combined Harvest		
Year[a]	MU 1	MU 2	MU 3	MU 1[b]	MU 2	MU 3	MU 1	MU 2	MU 3	MU 1	MU 2	MU 3
1996	0.619	0.720	0.188	0.200	0.323	0.103	0.925	0.500	0.083	1.126	0.823	0.187
1997	1.080	1.426	0.299	0.212	0.499	0.055	0.859	0.581	0.165	1.071	1.080	0.220
1998	1.191	1.406	0.365	0.184	0.305	0.090	0.785	0.323	0.185	0.969	0.628	0.275
1999	1.070	1.368	0.299	0.201	0.390	0.106	0.708	0.584	0.246	0.909	0.974	0.353
2000	1.041	1.457	0.369	0.241	0.565	0.157	0.798	0.604	0.287	1.039	1.169	0.443
2001	0.851	1.699	0.491	0.179	0.905	0.004	0.736	0.842	0.460	0.916	1.747	0.465
2002	1.466	1.991	0.568	0.338	1.100	0.000	0.979	0.887	0.640	1.317	1.987	0.640
2003	1.258	2.167	0.858	0.250	1.255	0.000	1.156	0.858	0.482	1.406	2.113	0.482
2004	1.929	2.418	0.768	0.289	1.288	0.000	0.802	0.959	0.659	1.091	2.246	0.659
2005	1.843	2.523	1.066	0.357	1.163	0.043	0.608	0.680	0.414	0.965	1.843	0.458
2006	1.516	4.040	1.930	0.236	0.744	0.070	0.820	0.649	0.201	1.055	1.394	0.271
2007	0.833	2.418	1.670	0.201	1.702	0.048	0.782	0.543	0.343	0.983	2.245	0.391
2008	0.708	2.300	1.380	0.000	1.377	0.139	0.410	0.628	0.490	0.410	2.005	0.629
2009	1.026	2.890	1.361	0.000	1.339	0.112	0.464	0.463	0.485	0.464	1.802	0.597
2010	1.053	2.176	2.025	0.196	0.936	0.153	0.694	0.522	0.324	0.890	1.458	0.477
2011	1.042	1.924	2.025	0.156	1.071	0.328	0.640	0.329	0.309	0.796	1.400	0.637
2012	0.905	2.176	2.268	0.000	1.285	0.469	0.883	0.567	0.278	0.883	1.852	0.747
2013	0.905	2.176	1.814	0.000	1.230	0.300	0.789	0.491	0.496	0.789	1.721	0.796
2014	0.801	2.012	1.605	0.000	1.280	0.266	0.391	0.263	0.714	0.391	1.543	0.980
2015	0.801	2.421	1.284	0.000	1.005	0.266	0.486	0.127	0.307	0.486	1.132	0.573
2016	1.153	1.499	1.223	0.103	0.688	0.350	0.783	0.105	0.173	0.886	0.793	0.523

[a] From 1996 through 2007, MU 2 and MU 3 were combined into a "central basin" quota in Ohio waters.

[b] Management Unit 1 (the western basin) was closed to commercial yellow perch harvest in 2008, 2009, 2012, 2013, 2014, and 2015.

Table 5: Ohio: The Total Harvest of Channel Catfish and Freshwater Drum 2016

Appendix A. Ohio's 2016 sport and commercial harvest (pounds) of major species. District 1 commercial harvest includes Sandusky Bay and the inland fishing district.

		Sport Harvest			Commercial Harvest			
Species	District	Private Boat	Charter Boat	Sport Total	Trap Net	Seine & Trotline	Commercial Total	Grand Total
Walleye	1	1,257,747	328,035	1,585,782	0	0	0	1,585,782
	2	401,641	29,812	431,453	0	0	0	431,453
	3	365,973	186,899	552,872	0	0	0	552,872
	Total	2,025,361	544,746	2,570,107	0	0	0	2,570,107
Yellow Perch	1	706,571	76,151	782,722	103,345	0	103,345	886,067
	2	104,084	752	104,836	688,033	0	688,033	792,869
	3	142,501	30,204	172,705	349,844	0	349,844	522,549
	Total	953,156	107,107	1,060,263	1,141,222	0	1,141,222	2,201,485
White Bass	1	13,240	4,961	18,201	340,206	55,078	395,284	413,485
	2	6,157	651	6,808	8,674	0	8,674	15,482
	3	8,520	5,713	14,233	40	0	40	14,273
	Total	27,917	11,325	39,242	348,920	55,078	403,998	443,240
Smallmouth Bass	1	979	279	1,258	0	0	0	1,258
	2	424	0	424	0	0	0	424
	3	772	0	772	0	0	0	772
	Total	2,175	279	2,454	0	0	0	2,454
Freshwater Drum	1	2,049	0	2,049	160,314	499,096	659,410	661,459
	2	501	0	501	30,053	0	30,053	30,554
	3	782	511	1,293	11	0	11	1,304
	Total	3,332	511	3,843	190,378	499,096	689,474	693,317
Channel Catfish	1	14,218	3,291	17,509	141,416	200,165	341,581	359,090
	2	12,583	459	13,042	34,220	0	34,220	47,262
	3	2,931	0	2,931	812	0	812	3,743
	Total	29,732	3,750	33,482	176,448	200,165	376,613	410,095
White Perch	1	13,910	3,225	17,135	723,741	28,455	752,196	769,331
	2	3,703	74	3,777	162,497	0	162,497	166,274
	3	1,483	146	1,629	1,434	0	1,434	3,063
	Total	19,096	3,445	22,541	887,672	28,455	916,127	938,668
Steelhead Trout	1	1,592	0	1,592	0	0	0	1,592
	2	212	0	212	0	0	0	212
	3	6,840	7,865	14,705	0	0	0	14,705
	Total	8,644	7,865	16,509	0	0	0	16,509
Other Species[a]	1	--	--	--	143,804	411,107	554,911	554,911
	2	--	--	--	2,173	0	2,173	2,173
	3	--	--	--	1,341	0	1,341	1,341
	Total	--	--	--	147,318	411,107	558,425	558,425
All Species	Total	3,069,413	679,028	3,748,441	2,891,958	1,193,901	4,085,859	7,834,300

[a] Commercial harvest of "Other Species" includes buffalo, bullhead, burbot, carp, gizzard shad, goldfish, quillback, suckers, and lake whitefish.

Table 6: Ohio – Total Catch in Ohio Waters by Species

Table 5.0.1. Annual commercial harvest (pounds) from the Ohio waters of Lake Erie, by species, 2007-2016.

Year	Buffalo	Bullhead	Burbot[a]	Carp	Channel Catfish	Freshwater Drum	Gizzard Shad	Goldfish	Quillback	Suckers	White Bass	White Perch	Whitefish	Yellow Perch[bc]	Total
2007	268,884	25,790	47	322,323	341,843	320,747	55,259	29,148	211,208	17,165	334,721	573,996	41,554	1,950,661	4,493,346
2008	226,574	26,881	4	198,616	447,232	423,705	38,272	32,941	197,378	23,971	424,225	545,138	82,914	1,515,666	4,183,517
2009	371,632	32,197	0	249,417	407,386	543,409	9,850	62,087	211,422	36,738	671,151	680,125	288,299	1,450,646	5,014,359
2010	343,962	33,401	0	255,991	452,637	491,999	14,745	59,681	183,093	22,076	357,083	551,042	83,303	1,284,404	4,133,417
2011	374,730	50,182	0	208,262	520,811	438,581	5,921	69,925	181,300	33,724	386,397	542,746	82,805	1,554,858	4,450,242
2012	308,828	24,140	153	199,653	372,242	514,310	30,215	42,032	138,053	20,168	489,364	798,759	119,887	1,754,737	4,812,541
2013	214,739	42,196	82	146,319	461,658	453,731	659	75,539	145,327	18,480	553,930	625,564	63,940	1,530,595	4,332,759
2014	255,454	19,799	110	84,935	419,853	371,623	2,874	33,874	132,892	5,978	942,460	652,359	34,731	1,546,147	4,503,089
2015	224,515	14,636	238	81,241	419,732	903,341	24,293	25,133	129,521	4,603	801,601	634,378	51,066	1,271,091	4,585,389
2016	184,528	26,117	243	90,862	376,613	689,474	91,087	31,477	101,763	8,179	403,998	916,127	24,169	1,141,222	4,085,859
Mean	287,702	29,914	70	194,084	427,044	495,716	20,232	47,818	170,022	20,323	551,215	622,679	94,278	1,539,867	4,500,962

[a] The commercial harvest of burbot was reinstated in 1995 following a 1971 closure.

[b] A spring (March - April) closure on commercial yellow perch harvest was enacted in 1993.

[c] Management Unit 1 (the western basin) was closed to commercial yellow perch harvest in 2008, 2009, 2012, 2013, 2014, and 2015.

Table 7: Freshwater Drum Productivity Worksheet (As prepared by the Data Deficient Working Group)

Freshwater Drum				
Productivity determinant	High Productivity (Low risk, score=1)	Medium Productivity (medium risk, score=2)	Low Productivity (high risk, score=3)	
Average age at maturity	<5	5-15 years	>15 years	Sexual maturity is reached 4-6 years (individual measuring 200mm); Female L50 for west basin reached at age 4 (Partnership data - FWD_CH_CAT_LENGTH_CPE_DDWG.xlsx)
Average maximum age	<10 years	10-25 years	>25 years	On average, species lives for 6-8 years (USGS Fact Sheet). Maximum age 6-8 years. Max reported age 13 (Fishbase accessed February 23, 2017). Max age >20years (Partnership data - FWD_CH_CAT_LENGTH_CPE_DDWG)).
Fecundity	>20,000 eggs per year	100, 20,000 eggs per year	<100 eggs per year	Large females are capable of laying up to 600,000 eggs (USGS Fact Sheet); egg numbers 43,000-508,000 (Scott and Crossman)
Average maximum size	<100 cm	100-300 cm	>300 cm	Max length 95.0 cm TL with a common length of 45.0 cm TL/mle/unsexed (Fishbase)
Average size at maturity	<40 cm	40-200 cm	>200 cm	Average size of maturity 20 cm; average size at maturity for females is 29 cm. Lake wide average L_{50} (sexes combined) (1989-2016) is 27cm. (Partnership Data - FWD_CH_CAT_LENGTH_CPE_DDWG.xlsx)
Reproductive strategy	low parental investment	moderate parental investment	High parental investment	Spawning occures in open water. Eggs are buoyant which float to the surface (USGS Fact Sheet and Scott Crossman).NOAA has done PSAs (see attached) on selected US fisheries as follows: Breeding strategy: The breeding strategy of a stock provides an indication of the level of mortality that might be expected for the offspring in the first stages of life. To estimate offspring mortality, NOAA used Winemiller's (1989) index of parental investment. The index ranges in score from 0 to 14 and is composed of: 1) the placement of larvae or zygotes (i.e., in nest or into water column; score ranges from 0 to 2); 2) the length of time of parental protection of zygotes or larvae (score ranges from 0 to 4); and 3) the length of gestation period or nutritional contribution. They suggest (see their Table 1) scores of 0 mean low parental investment, score of 1-3 indicates moderate parental investment and scores >=4 indicate high parental investment. If we adopt something similar to NOAA, then FWD would score as 0+0+0=0 (low parental investment/low risk)
Trophic level	<2.75	2.75-3.25	>3.25	Trophic level = 3.4 based on food items (Fishbase accessed February 23, 2017)

Table 8: Channel Catfish: Productivity Worksheet (As prepared by the Data Deficient Working Group)

Channel Catfish				
Productivity determinant	High Productivity (Low risk, score=1)	Medium Productivity (medium risk, score=2)	Low Productivity (high risk, score=3)	
Average age at maturity	<5	5-15 years	>15 years	Sexual maturity can be reached 2-3 years(Fishbase); Size at sexual maturity is not known in Canada, but in the south they usually mature at 10.5 - 16.0 inches (267-406 mm) at 5-8 years of age (Scott and Crossman). Estimated femaleL50 in west basin 40 cm (Partnership data - FWD_CH_CAT_LENGTH_CPE_DDWG.xlsx). Estimated age for 40 cm Catfish is between 7-8 years of age (Parthership data - FWD_CH_CAT_LENGTH_CPE_DDWG.xlsx))
Average maximum age	<10 years	10-25 years	>25 years	Max length: 132 cm TL with a common length of 57.0 cm SL male /unsexed. Max age reported 24 years (Fishbase); Average maximum age is between 7 - 9, average age of 8. (Partnership data - FWD_CH_CAT_LENGTH_CPE_DDWG.xlsx)
Fecundity	>20,000 eggs per year	100, 20,000 eggs per year	<100 eggs per year	an egg mass can contain up to 20,000 eggs (Fishbase). 450-500 eggs per ounce; 1-4 pound female can produce 400 eggs and/or 26 inch (66.4 cm) female can produce up to 34,000 eggs (Scott andCrossman)
Average maximum size	<100 cm	100-300 cm	>300 cm	Size of age 8 >40 cm, average max. size 60-80 cm (partnership data - FWD_CH_CAT_LENGTH_CPE_DDWG.xlsx)
Average size at maturity	<40 cm	40-200 cm	>200 cm	Maturity Lm = 36 cm (Fishbase); Female L_{50} (lakewide, sexes-combined 1989-2016) is 39 cm (see: FWD_CH_CAT_LENGTH_CPE_DDWG.xlsx)
Reproductive strategy	low parental investment	moderate parental investment	High parental investment	Spawning occurs in nest constructed and guarded by male (USGS Fact Sheet and Scott + Crossman).NOAA has done PSAs (see attached) on selected US fisheries as follows: Breeding strategy: The breeding strategy of a stock provides an indication of the level of mortality that might be expected for the offspring in the first stages of life. To estimate offspring mortality, NOAA used Winemiller's (1989) index of parental investment. The index ranges in score from 0 to 14 and is composed of: 1) the placement of larvae or zygotes (i.e., in nest or into water column; score ranges from 0 to 2); 2) the length of time of parental protection of zygotes or larvae (score ranges from 0 to 4); and 3) the length of gestation period or nutritional contribution. They suggest (see their Table 1) scores of 0 mean low parental investment, score of 1-3 indicates moderate parental investment and scores >=4 indicate high parental investment. If we adopt something similar to NOAA, then CC would score as 2+2+3=6 (high parental investment/high risk)
Trophic level	<2.75	2.75-3.25	>3.25	Trophic level = 4.2 based on diets (Fishbase)

Table 9: Freshwater Drum Susceptibility Worksheet (As prepared by the Data Deficient Working Group)

Freshwater Drum MU1 trap net					
Susceptibility Attribute	Low susceptibility (Low risk, score=1)	Medium susceptibility (Medium risk, score=1)	High susceptibility (High risk, score=1)		
Areal Overlap (availability): Overlap of the fishing effort with a species concentration of the stock	<10%	10-30%	>30%		Ohio targeted trap net fishery occurs offhsore in 30-40 ft of water in a single grid near Kelly Island (personal communication Travis Hartman). Ohio records indicate that Yellow Perch trap
Encounterability: The position of the stock/species with the water column relative to the fishing gear, and the position of the stock/species within the habitat relative to the position of the gear	Low overlap with fishing gear (low encounterability)	Medium overlap with fishing gear	High overlap with the fishing gear (high encounterability)		Freshwater Drum are primarily benthic but do spawn pelagically. Ohio Yellow Perch trapnet fishery is set on bottom in offshore waters in 30-40ft of water with net sets 15ft high (personal communication Travis Hartman).
Selectibity of the gear type Potential of the gear to retain species	A. Individual <size at maturity are rarely caught	A. Individual <size at maturity are regularly caught	A. Individual <size at maturity are frequently caught		Ohio Yellow Perch gear configuration selects for species >8 inches or >20cm. On occasion fish <8 inches are caught. 50% of FWD mature at approxiamterly 27 cm would indicate that some individuals <size of maturity may be caught; At hlf the size of maturity (13.5 cm or 5 inches) would expect indviduals could escape
	Individual <size at maturity can escape or avoid gear	Individual < half the size at maturity can escape or avoid gear	Individual < half the size at maturity are retained by gear		
Post-capture mortality (PCM): The chance that, if captured, a species would be released and that it would e in a good condition permitting sbusequent survival	Evidence of majority released postcapture and survival	Evidence of some released postcapture and survival	Retained species or majority dead when released		There is evidence that Ohio Yellow Perch trap nets do catch / harvest small proportion of Frehwater Drum. Retention of Freshwater Drum depends on amount Perch is caught or market conditions at the time. FWD are considered to be a tolerant species (see:

Table 10: Channel Catfish Susceptibility Worksheet (As prepared by the Data Deficient Working Group)

Channel Catfish - MU1 trap net					
Susceptibility Attribute	Low susceptibility (Low risk, score=1)	Medium susceptibility (Medium risk, score=1)	High susceptibility (High risk, score=1)		
Areal Overlap (availability): Overlap of the fishing effort with a species concentration of the stock	<10%	10-30%	>30%		Ohio targeted trap net fishery occurs offhsore in 30-40 ft of water in a single grid near Kelly Island (personal communication Travis Hartman). Ohio records indicate that Yellow Perch trap
Encounterability: The position of the stock/species with the water column relative to the fishing gear, and the position of the stock/species within the habitat relative to the position of the gear	Low overlap with fishing gear (low encounterability)	Medium overlap with fishing gear	High overlap with the fishing gear (high encounterability)		Ohio Yellow Perch trapnet fishery is set in offshore waters in 30-40ft of water with net sets 15ft high (personal communication Travis Hartman). Channel Catfish ususally inhabit cool, clear, deeper water with sand, gravel, or rubble bottoms (Scott and Crossman)
Selectibity of the gear type Potential of the gear to retain species	A. Individual <size at maturity are rarely caught	A. Individual <size at maturity are regularly caught	A. Individual <size at maturity are frequently caught		Ohio Yellow Perch gear configuration selects for species >8 inches or >20cm. On occasion fish <8 inches are caught. 50% of Channel Catfish mature at approxiamterly 40 cm would indicate that some individuals <size of maturity may be caught; At half the size of maturity (20 cm or 8 inches) would expect to be caught, but the harvest of Channel Catfish in Yellow Perch trapnets are <10%
	Individual <size at maturity can escape or avoid gear	Individual < half the size at maturity can escape or avoid gear	Individual < half the size at maturity are retained by gear		
Post-capture mortality (PCM): The chance that, if captured, a species would be released and that it would e in a good condition permitting sbusequent survival	Evidence of majority released postcapture and survival	Evidence of some released postcapture and survival	Retained species or majority dead when released		There is evidence that Ohio Yellow Perch trap nets do catch / harvest small proportion of Channel Catfish. Harvest of Channel Catfish depends on the amount Perch is caught or market conditions at the time. Channel Catfish tolerate a wide range of environmental conditions (see:

Table 11 Freshwater Drum & Channel Catfish: PSA Analysis (As prepared by the Data Deficient Working Group)

						Productivity Scores [1-3]								Susceptibility Scores [1-3]					1.1.1 only					PSA scores (automatic)			
PI	TAXA_NAME	FAMILY_NAME	SCIENTIFIC_NAME	COMMON_NAME	GEAR_TYPE (1.1.1)	Average age at maturity	Average max age	Fecundity	Average max size	Average size at Maturity	Reproductive strategy	Trophic level (fishbase)	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	Catch (tons) (1.1.1)	Weighting (1.1.1)	Weighted Total	Weigted average	Color on PSA plot	PSA Score	MSC Score	Risk Category Name	MSC scoring guidepost
2.2.1		Sciaenidae	Aplodinotus grunniens	Freshwater Drum	Freshwater Drum Trapnet MU1	1	2	1	1	1	1	3	1.43	1	2	2	2	1.18	NA	NA	NA	NA		1.85	97.0	Low	>80
2.2.1	Chondrichthyan	Ictaluridae	Ictalurus punctatus	Channel Catfish	Channel Catfish Trapnet MU1	2	1	1	1	1	3	3	1.71	1	2	2	1	1.08	NA	NA	NA	NA		2.02	94.6	Low	>80

4.4 Condition YP4

PI & Score	PI	Scoring issues / Scoring Guidepost Text	Score
	2.2.3	Issues at SG80 a. Qualitative information and some quantitative information are available on the amount of main by-catch species taken by the fishery. b. Information is sufficient to estimate outcome status with respect to biologically based limits. c. Information is adequate to support a partial strategy to manage main by-catch species. d. Sufficient data continue to be collected to detect any increase in risk to main by-catch species (e.g., due to changes in the outcome indicator scores or the operation of the fishery or the effectively of the strategy).	75
Justification	Issue a. For all MUs there is substantial qualitative information that indicates there is no by-catch; unwanted catch remains alive in the trap until released by the fishers. However, the auditors have not identified any quantitative information as evidence on the quantity and type of fish that are released and the fishery does not meet SG80 SIa		
Condition	By the third annual surveillance audit, the following SG80 SI must be met: Qualitative information and some quantitative information are available on the amount of main by-catch species taken by the fishery, including the amount and types of released by-catch.		
Milestones	At the first annual audit, the client will present the CAB with evidence that there has been consideration of the options for collecting released by-catch data in the Ohio trap net fishery. The required minimum score is 75. At the second annual audit, the client will present the CAB with evidence that a mechanism to collect released by-catch data has been designed and has been implemented. The required minimum score is 75. At the third annual audit, the client will present the CAB with evidence to show that released by- catch data has been collected and analyzed. The required minimum score is 80.		
Client action plan	The OCFA will request that the ODNR begin considering options for collecting data on released by-catch in the Ohio trap net fishery. Evidence of these considerations will be requested by the OCFA, and/or provided directly to the CAB by ODNR. ODNR will be requested to design and implement a mechanism for collecting the released by-catch data. OCFA will provide any help necessary to support this activity. It is important that evidence of the design and implementation of this data collection mechanism be provided to the CAB by the second annual audit. Once a data collection mechanism has been designed it is proposed that ODNR will begin to collect and analyse the released by-catch data. Evidence of this work will be provided to the CAB resulting in the removal of this Condition.		
Progress on Condition [2016]	As shown by the evidence presented (letter from OCFA to ODNR and the e mail response – see below) the client requested ODNR to begin considering the options for collecting data on released by-catch in the Ohio trap net fishery.		
Status of condition [2016]	Progress on this condition is on schedule.		

Client Submission (2017)	The client pre-audit submission was: • ODNR has implemented process for collecting data on released by-catch in the Ohio Yellow Perch trap net fishery in all MUs. • Documentation provided: Email thread between OCFA and Travis Hartman (Box 1) documenting that implementation has occurred for 2017; Table 15 from Travis Hartman showing preliminary estimates of retained catch and released catch for 2017.
Progress on Condition [2017]	1. This condition relates to data on the released catch of non-target species in the yellow perch trap net fishery operating in Ohio waters (i.e. all MUs). 2. The main issues are the quantity of non-targeted species that are released and the post release mortality (so 100 % survival would indicate zero by catch). 3. The rationale for PI 2.2.3 (Sia) in the original assessment report (Scott *et al* 2015) for the Ohio yellow perch trap fishery in all Mus was "*substantial qualitative information indicates there is no by-catch; unwanted catch remains alive in the trap until released by the fishers. The fishery meets SG60. However, the auditors have not identified any quantitative information as evidence on the quantity and type of fish that are released and the fishery does not meet SG80Sia*". 4. This rationale was based on the following in the main body of the text "*While, in principle, there is no by-catch in the Ohio trap net fishery as unwanted fish is released alive, there is no information or monitoring on released species and no data are available to measure the quantities. As there is no data on PRM, it is not possible to be certain that all released fish survive and there is no by-catch in the fishery. Kinnunen & Pistis (2007) concluded that in general, trap nets have low impact on non-target species; trap nets collect live catches, they have small incidence of by-catch compared to other gear, and the survival of by-catch is high*". 5. The uncertainty on post release mortality prevented the fishery (all MUs) achieving a score of 100 for PI 2.2.1, although it was concluded that the evidence available indicated that "*there are no main bycatch species in the trap net fishery. The fishery meets SG60 & SG80 Sia*". 6. The concern leading to the condition was the lack of "some" quantitative data. 7. As evidenced in the email chain shown (Box 1), release data in the targeted yellow perch trap fishery is now being collected and there is a report (table 15). However, as acknowledged by Hartman, this is preliminary in nature and is aggregated over the 3 MUs that comprise the Ohio fishery and which are assessed on an individual basis. On that basis, it may be concluded that evidence indicates that a mechanism to collect released by-catch data has been designed and has been implemented.
Status of condition [2017]	**The client has met the 2nd year milestone for condition YP4. The fishery is on-target.** At the third annual audit, data disaggregated by MU showing the amount of each species released as a proportion of total catch will be needed. In the case that any released species comprises more than 5 % of the total catch in the directed fishery, the auditors must review evidence on post release mortality to determine if there are any bycatch species. If evidence indicates that there are main bycatch species, there may be a review of the scoring of PI 2.2.1 and PI 2.2.2

Box 1: Email Chain

REDACTED: The short answer is “yes”, we asked them to estimate totals for all species. The longer answer is that I would need t= do a much more thorough summary to give you totals by management unit and=month. The way the data are exported I would need to download the data by license and run each through a SAS program to=create the daily catch data by license, MU, and “other” species, compa=ed to the yellow perch that I can export with those data in one simple dow=load.

That all being said, I ran a very quick summary of r=ported harvest and releases for all the other species. This export d=es not include month or harvest grid, but gives us a quick look at the tot=l harvest and reported release estimates. I hope the attached summary will suffice for now, and when the season is o=er I can give you a more robust summary.

Please keep in mind this is a very preliminary summa=y with minimal quality control checks. I compared the reported harve=t for each species to past seasons, and everything falls in line with what=I would expect.

Let me know if you need anything else.

Travis Hartman, Lake Erie Program Administrator, ODNR, Division of Wildlife

From: Kevin Reid [mailto:Kevin.Reid@ocfa.on.c=] Sent: Wednesday, September 06, 2017 11:10 AM To: Hartman, Travis <travis.hartman@dnr.state.oh.us>; Jane Gra=am Jane.Graham@ocfa.on.ca Subject: RE: MSC Surveillance Audit

Thanks for this. Was t=ere any reporting done on releases of spp. other than YP? If so, can we ge= those numbers as well?

From: travis.hartman@dnr.state.oh.us [mailto:travis.hartman@dnr.state.oh.us] Sent: Wednesday, September 06, 2017 10:57 AM To: Jane Graham Jane.G=aham@ocfa.on.ca Cc: Kevin Reid <Kevin.Re=d@ocfa.on.ca Subject: RE: MSC Surveillance Audit

Please find attached a very preliminary summary of t=is year’s reported estimated pounds of released yellow perch. I su=marized the released yellow perch by management unit and by month. I=included notes below the summary. At this point our trap net fisheryis releasing just over 6% of their total yellow perch=catch, with the highest release rate in management unit one. Even if=100% mortality of released fish is assumed we should end up well within ou= Ohio yellow perch TAC in each MU. The current total (through the end of August) is just over 85 thousand pounds =f released yellow perch. Please let me know if you would like the data summar=zed in any alternative fashion.

I also attached a PDF screen shot of our catch repor=ing software. I included notes describing the yellow perch reporting=fields.

From: Jane Graham [mailto:Jane.Graham@ocfa.on.ca] Sent: Tuesday, September 05, 2017 10:47 AM To: Hartman, Travis travis.hartman@dnr.state.oh.us Cc: Kevin Reid Kevin.Re=d@ocfa.on.ca Subject: MSC Surveillance Audit

In preparation for the 2nd MSC surveillance audit that=we have coming up on Wednesday, September 27th, I would like to=follow-up on the YP4 Condition which states from the last audit: YP4. The Milestone for the 2nd surveillance=audit – the client will present the CAB with evidence that a mechanism t= collect released bi-catch data has been designed and has been implemented= I know that you provided me with the following state=ent in an earlier email: “Additionally, we have added “released fish=94 reporting to our electronic catch reporting system this season and I wi=l be able to summarize their estimates of released fish by grid, basin and=month for 2017 fishing.” Would you be able to send this to me in a separate e=ail, as well as any other details, and if I could get a copy of the form t=at is being used that would be very helpful for the surveillance audit.&nb=p; Thank you

Table 12: Ohio: Estimated Release of Species from Trap Nets

Species	Reported harvest (pounds)	Estimated release (pounds)	Total catch	% of catch released
Buffalo	42,660	280	42,940	1%
Bullhead	32	20	52	38%
Burbot	167	79	246	32%
Carp	15,448	354	15,802	2%
Ch. Catfish	139,325	8,476	147,801	6%
Drum	161,441	71,826	233,267	31%
Gizzard Shad	1,347	125,144	126,491	99%
Goldfish	71	2	73	3%
Quillback	70,561	459	71,020	1%
Suckers	6,145	2,800	8,945	31%
White Bass	249,169	3,472	252,641	1%
White Perch	874,758	111,597	986,355	11%
Whitefish	507	340	847	40%

4.5 Condition WE1

PI & Score	PI	Scoring issues / Scoring Guidepost Text	Score
	2.1.1	Issues at SG80 a. Main retained species are highly likely to be within biologically based limits (if not, go to SI c below). c. If main retained species are outside the limits there is a partial strategy of demonstrably effective management measures in place such that the fishery does not hinder recovery and rebuilding.	70
Justification	Main Retained species considered for the Walleye UoC are Lake whitefish and White bass. Lake whitefish is not within limits. Issue c. The decline in the Lake whitefish population is shown by fishery and survey indicators. The continued poor recruitment means F must be reduced.		
Condition	By the fourth annual surveillance audit, based on Condition WE2 the partial strategy of demonstrably effective management measures will be in place such that the fishery does not hinder the recovery and rebuilding of the Lake whitefish stock.		
Milestones	As condition WE2. By the first annual surveillance audit, the client will provide written evidence to the CAB showing that the issue of the catch of Lake whitefish in the large mesh fishery has been reviewed and there has been an options analysis of the management measures needed to ensure such that the fishery does not hinder the recovery and rebuilding of the Lake whitefish stock. The required minimum score is 70. By the second annual surveillance audit, the client will provide written evidence to the CAB that the required partial strategies have been designed and steps have been taken towards their implementation. The required minimum score is 70. By the third annual surveillance audit, the client will provide written evidence to the CAB that the partial strategies are in place and there is some evidence that they are being implemented successfully. The required minimum score is 70. By the fourth annual surveillance audit, information about the fishery and/or the species involved will made available to the CAB by the client so that there is some objective basis for confidence that the partial strategy is working. The required minimum score is 80.		
Client action plan	This partial strategy for Lake whitefish recovery will involve agencies and stakeholders from multiple Lake Erie Committee (LEC) jurisdictions; therefore it is difficult to guarantee timelines for progress. The LEC is comprised of representatives from the province of Ontario; and, the states of Michigan, Ohio, Pennsylvania and New York. As the basis for meeting Condition WE1, it is proposed that the LEC agencies will work cooperatively and with the Lake whitefish fishery stakeholders to investigate moving forward with a partial management strategy for the recovery of Lake whitefish in Lake Erie. As part of the development of the multi-agency partial management strategy for the recovery of Lake whitefish, it is anticipated that consultations will begin with LEC and their respective stakeholders to examine options for the assessment and management of Lake whitefish. Evidence of these consultations will be provided to the CAB by the first annual audit. It is proposed that the LEC agencies work towards an agreement on the preferred partial strategy for lake whitefish assessment and management. Documentation of the partial strategy, including implementation plans, will be presented to the CAB by the second annual audit.		

	It is proposed that the LEC agencies will implement the partial strategy. Cooperatively, the OCFA and LEC will present the CAB with evidence that an effective suite of management measures will be in place such that the fishery does not hinder the recovery and rebuilding of the Lake whitefish stock by the third and fourth annual audits.
Progress on Condition [2016]	Evidence was provided (see below) to show: (i) LEC formed the DDFWG to focus on the development of partial harvest strategies for data deficient stocks including lake whitefish. (ii) The client is sponsoring a MITACS PDF for Dr. Fan Zhang to develop stock assessment models for lake whitefish. (iii) MITACS is a cost-share fellowship program between industry and academia to train post-doctoral fellows. (iv) Dr. Zhang is a member of the DDFWG. (v) DDFWG met twice until end-August via conference call. (vi) Inter-agency Lake whitefish data have been acquired by Dr. Zhang. DDFWG has developed a preliminary SCA model for Lake Whitefish. A walleye quota transfer pilot project in 2015 and 2016 allowed the transfer of QZ1 towards areas to the east and decrease the overlap with Lake White fish. This is expected to result in a lower share of this species in the retained catch in the UoC.
Status of condition [2016]	**Progress on this condition is on schedule.** The client provided written evidence showing that the issue of the catch of Lake whitefish in the large mesh fishery has been addressed and there have been steps forward developing analysis of the management measures needed to ensure that the fishery does not hinder the recovery and rebuilding of the stock. Despite the absence of a defined partial strategy based on stock assessment models, the lake whitefish quota, which is completely taken in the walleye fishery, has decreased and walleye quota transfers are expected to control the lake whitefish catch. Given the amount of work to be completed, the auditors agreed to the client's request to reschedule the milestones. This did not change the requirement to close the condition at the Year 4 surveillance audit. Accordingly: By the second annual surveillance audit, the client will provide written evidence to the CAB that a Lake whitefish assessment models has been completed with simulations to test alternative models, and there has been progress in implementing a defined partial strategy. The required minimum score is 70. By the third annual surveillance audit, the client will provide written evidence to the CAB that the partial strategies are in place and there is some evidence that they are being implemented successfully. The required minimum score is 70. By the fourth annual surveillance audit, information about the fishery and/or the species involved will made available to the CAB by the client so that there is some objective basis for confidence that the partial strategy is working. The required minimum score is 80.
Client Submission (2017)	The client pre-audit submission was: • The LEC has previously formed a data-deficient fishery working group (DDFWG) to commence projects focused on development of partial strategies for Lake Whitefish • DDFWG has developed a preliminary SCA model and report on status and causes of decline for Lake Erie Lake Whitefish showing that recent decline and failure to recover is not attributable to fishing mortality providing evidence that a partial strategy is not necessary to ensure the large mesh fishery is not hindering recovery or rebuilding • The DDFWG has completed a PSA for Lake Whitefish showing that risk of large mesh gill net fishery hindering recovery of Lake Whitefish is very low – MSC score >90 – therefore a partial strategy is not necessary and following measures should be sufficient to ensure the large mesh fishery is not hindering recover: Measure 1 – ON LWF fishery is managed via ITQ; Measure 2 - During 2016 Walleye quota transfer pilot project transferred 494,809 lbs. of Walleye quota out of QZ1 thereby reducing Lake Whitefish by-catch by approximately 5000 to 6000 lbs; Measure 3 - There has been no targeting of Lake Whitefish allowed

	since 2013 and the species has not qualified as a "main" since 2013; Measure 4 - Immature LWF are not fully vulnerable to the large mesh fishery in QZ1; Measure 5 - OCFA sponsored MITACS PDF is still working on development of alternative stock assessment models for Lake Whitefish – available early 2018 • There is evidence from partnership data that a detectable year class was formed in 2014 (see slide 84 in SOS presentation to FMZ19 December 2016) • Documentation provided: Results of Lake Whitefish PSA for large mesh gill net fishery and supporting files; Summary of commercial fishery Walleye Transfers 2016; Coldwater Task Group report: Whitefish_Charge8_PreLEC16; WTG_report_2016; 2016 LEMU Status of Major Stocks report to FMZ19 December 2017 • Revised schedule for meeting milestones: Milestones no longer applicable as the recent decline of Lake Whitefish, and failure to recover, is not attributable to fishing mortality and a partial strategy is not deemed necessary.
Progress on Condition [2017]	1. This condition relates to the retained catch in the walleye large mesh gillnet fishery operating in MU1. 2. It articulates concern about the potential for the certified fishery to hinder the recovery and rebuilding of the Lake Erie population of Lake Whitefish. 3. Following the first annual surveillance audit, the second-year milestone was changed to "*the client will provide written evidence to the CAB that a Lake whitefish assessment model has been completed with simulations to test alternative models, and there has been progress in implementing a defined partial strategy*". 4. The report by the Coldwater Task Group (CTG) (2016) notes "*Although Lake Whitefish are managed independently by jurisdictions, cooperative assessment is reported annually by the Cold Water Task Group under Charge 2: assess the Lake Whitefish fishery, age structure, growth, diet, seasonal distribution and other population parameters. In 2014, the deteriorating status of Lake Whitefish prompted the Lake Erie Committee to add another charge (8) to the Cold Water Task Group: Prepare a report addressing the current state of knowledge of Lake Whitefish populations in Lake Erie, including knowledge gaps, impediments, uncertainties, and recommendations for strategies to advise management*". 5. Relevant parts of the report are: Bence *et al*. (2014)[5] using simulations, found that treating multiple populations as a single stock provided better management performance and less biased estimates of spawning stock biomass compared to separate stock assessments under various scenarios of intermixing. Quantifying mixing of stocks is important however, for assessing changes in stock productivity to avoid overexploitation of low productivity stocks (Bence *et al*. 2014). Lake Whitefish population estimates for ages 3 and older were generated by statistical catch-at-age analysis using Auto Differentiation Model Builder, a C++ application (ADMB Project 2015). The SCAA model code was adapted from the Walleye Task Group (2012). The SCAA Lake Whitefish population estimates peaked in 1998 at 4.1M and again in 2006 at 13.6 M after which, in the absence of strong recruitment, the population declined steadily to 520 K in 2015. Compared to Cohort Analysis (CA) or Virtual Population Analysis (VPA), SCAA has the advantage of auxiliary information such as fishery effort and survey catch rates. Fishery catchability in the SCAA model is assumed constant for parsimony; however, Lake Whitefish harvest resulting from targeted and non-target fisheries may violate this assumption to some degree. CA was completed to provide an assessment for comparison that didn't rely on fishery effort data.

[5] Note: reference not found in the CTG report.

	CA estimates peaked in 1997 at 12.2M and again in 2006 at 14.0 M but declined rapidly after 2009 to 323 K in 2015. While abundance trends were similar to SCAA, some differences were evident; the decline in recent CA abundance estimates was delayed and peak abundance during the late 1990s was much higher in CA compared to SCAA. Abundance trends for both methods converged approaching 2015. The Yield per Recruit curve was nearly asymptotic, with Fmax occurring at F=11.6 for pooled sexes and 12.0 for females. Due to the shape of the Y/R curve, lower fishing rates achieved nearly the yield achieved at Fmax. In fact, 90% of the yield at Fmax was attained at F=1.49 (pooled sexes) and 1.37 (females). F0.1 was at F=0.55 for pooled sexes and F=0.51 for females. At F0.1 rates, spawner biomass per recruit (SSB) was 53% and 51% of an unfished population for pooled sexes and females, respectively. SSB20% occurred at F=10.2 and F=7.6 for pooled sexes and females, respectively. While SSB20% is considered a minimum spawner biomass threshold for some species, estimated survival rates were perilously low (<1%) for Lake Whitefish at these fishing rates. Fully selected instantaneous fishing mortality (F) estimates from SCAA and CA are presented for the 22 year time series along with biological reference points; F at SSB as a % of unfished spawning stock biomass per recruit (40%,50%,60%,70%,80%). Estimated SCAA F were at levels corresponding to SSB56% - SSB96% whereas CA estimates of F corresponded to SSB38%-SSB84%. This analysis implies that fishing intensities experienced by Lake Whitefish in Lake Erie have not been aggressive. The higher estimates of F by CA during the latter part of the time series was due to the presence of very weak, imprecisely assessed, cohorts in the fisheries. These high estimates of F were associated with harvest less than 1000 fish at age during a given year. Absolute spawning stock biomass (SSB) estimates in 2015 (Figure 37) were 13% (SCAA) or 5 % (CA) of the maximum estimated SSB from 1994-2015. This suggests that Lake Whitefish spawner biomass in 2015 (and 2016) would fall below a spawner biomass threshold level set at 20% of an unfished population. Such critically low spawning stock biomass would often trigger a management response if integrated within harvest control rules. Although fishing was not likely the main cause of poor recruitment, continued efforts to conserve Lake Whitefish spawning stocks are necessary 6. The report made various recommendations to improve understanding of factors affecting recruitment i.e. spawning habitat, nursery habitat, nutrient loading & primary production, environmental conditions & climate change, and survival during early life stages. 7. Given SCAA model assumptions, fishing rates do not appear to be excessive based on per recruit BRPs. However, the current aggregate population status of Lake Erie Lake Whitefish appears to be critically low with correspondingly low SSB estimates relative to the 22 year time frame (1994-2015). While there appears to be a 2015 year class of some strength and a 2014 cohort present, these fish will not contribute to spawner biomass significantly until 2019 or later. We recommend considering spawning sanctuaries until (aggregate SCAA) spawner biomass estimates recover to a predetermined level. 8. Per recruit statistic BRPs should be used to describe the risk level associated with target fishing rates until a robust stock recruitment simulation that incorporates environmental factors can be configured. 9. Low quotas promote incidental-only fisheries but this may be offset by a landed value incentive to continue targeting Lake Whitefish. We recommend that fish processors be encouraged to pay only a nominal amount for Lake Whitefish when Whitefish harvest is intended to be incidental. Resource stewardship may be achieved through education. To discourage harvest of Lake Whitefish when stocks are depressed, effort restrictions and / or over quota penalties should be considered once Lake Whitefish quotas are attained. 10. Development of HCRs for Lake Whitefish is challenging due to the influence of Walleye and White Bass fisheries on Lake Whitefish harvest, limited knowledge of stock productivity, and deficiency of data or effort focused on recruitment variability. We recommend HCRs utilize existing or alternative

	biological reference points specific to Lake Erie Lake Whitefish. Yield per recruit BRPs if used, should be accompanied by some reference to SCAA spawning stock biomass estimates to ensure adequate escapement 11. The client highlights that various measures constitute a partial strategy i.e Measure 1 – ON LWF fishery is managed via ITQ; Measure 2 - During 2016 Walleye quota transfer pilot project transferred 494,809 lbs. of Walleye quota out of QZ1 thereby reducing Lake Whitefish by-catch by approximately 5000 to 6000 lbs; Measure 3 - There has been no targeting of Lake Whitefish allowed since 2013 and the species has not qualified as a "main" since 2013 (auditors note: the species would potentially classify as main due it being vulnerable rather than its share of the total catch); Measure 4 - Immature LWF are not fully vulnerable to the large mesh fishery in QZ1; Measure 5 - OCFA sponsored MITACS PDF is still working on development of alternative stock assessment models for Lake Whitefish – available early 2018. 12. CTG (2017) refers to charge 8 results: Model results indicate declining abundance; Critically low spawner biomass; Does fishing have negligible impact? Do SCAA assumptions apply at low stock sizes? Conservation of spawners to support recruitment Continue existing approaches to reduce harvest, effort; Pursue more active management responses to protect Lake Whitefish populations in Lake Erie. 13. CTG (2017) also refers to management measures, with a decreased quota due to trends in Lake Whitefish population to 60,000 lbs and the discouragement of targeting Lake whitefish (these are anticipated to have minimal impact on other fisheries). 14. By email dated 26 September 2017, Andy Cook (Assessment biologist LEMU) advised the client that "*Catches of Lake Whitefish showed improvement in 2017 in the east and Pennsylvania Ridge Partnership surveys. Catch rates (2017) in the east basin are the second highest in the 1989-2017 time series (highest was in 1998); in Pennsylvania Ridge, 2017 catch rates were the median (1991-2017). There were 56 LWF caught in the east; 7 LWF caught in Pennsylvania Ridge. The length distribution suggests that most Whitefish may fall within ages 2 & 3. Yearlings may be present. Three (3) Whitefish ≥43 cm total length*". The related client's comments were "*….based on the 2017 partnership index fishing survey there is a strong evidence of very good recruitment from either 2014, 2015, or both years. This is the first year that we would expect LWF from 2015 to become fully vulnerable to the index gear. The 2017 catch rate in the east basin is even higher than was observed when the 2003 year class recruited to the survey gear - further evidence that the large mesh gill net fishery is not impairing recruitment to the LWF stock*".
Status of condition [2017]	The CTG report provides evidence that the client has met the first part of the milestone for the second year: a Lake whitefish assessment model has been completed with simulations to test alternative models. The measures implemented of transferring quota to other QZs constitute a partial strategy and provide evidence that the client has met the second part of the milestone for the second year: there has been progress in implementing a defined partial strategy. **The client has met the 2nd year milestone for condition WE1. The fishery is on-target.**

	We note that the SCA model is preliminary and there is no concrete evidence of the impact of the measures. As such we do not accept the client's conclusion that "*Milestones no longer applicable as the recent decline of Lake Whitefish, and failure to recover, is not attributable to fishing mortality and a partial strategy is not deemed necessary*". The milestone for the third annual surveillance audit is maintained i.e. "*the client will provide written evidence to the CAB that the partial strategies are in place and there is some evidence that they are being implemented successfully*". The auditors will require evidence on either: lack of targeting of lake whitefish; the actual bycatch (% of total catch) of lake whitefish in the directed walleye fishery preferably as part of a historical time series; progress on the implementation of measures to protect spawning areas; lower quota; and evidence of the impact of the walleye quota transfer mechanism on the catch of Lake whitefish; **or** evidence that a. Lake whitefish is highly likely to be within biologically based limits and under 5% of the total catch so it does not constitute a main retained (CR v.1.3) or primary (CR v2.0) species). This would be accompanied by a request for the auditors to rescore PI 2.1.1 in the expectation that a score of 80 would be achieved with the consequent closing of the condition.

Evidence of Lake Whitefish quota transfer

Ministry of Natural
Resources and Forestry
Provincial Services Division
Fish and Wildlife Services Branch

anagement Unit
320 Milo Road
Wheatley, ON N0P 2P0
Telephone: (519) 825-4684
Facsimile: (519) 825-3163

Ministère des Richesses
naturelles et des Forêts
Division des services provinciaux
Direction des services de gestion
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320, rue Milo
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Télécopieur: (519) 825-3163

Ontario

September 13, 2017

To: All Lake Erie Commercial Fishing License Holders

Re: Continuation of pilot project - Inter-basin transfers of Walleye quota in Lake Erie

As many of you are aware, there are ongoing concerns regarding declining Lake Whitefish abundance in Lake Erie. The majority of the harvest of these fish occurs in the fall when they are spawning as bycatch in the Walleye large mesh fishery in Quota Area 1. To reduce this harvest, the allowance of transfers of Walleye between quota areas will continue through 2017. This is being done in order to move Walleye harvest to areas where Whitefish bycatch is not as prevalent. Walleye transfers between quota zones will be permitted in the following manner:

1) from Quota Area 1 to Quota Area 2 or Quota Area 3
2) from Quota Area 2 to Quota Area 3 or vice versa

No Walleye quota may be transferred back into Quota Area 1 under any circumstance.

This pilot project will be reviewed annually by Lake Erie Management Unit and will be discussed at Zone 19 council meetings. It success will be evaluated based on how well it is being utilized (ie fishers are taking advantage of the program) and how well it is being received by commercial fishery and recreational fishery stakeholder groups.

If you have any additional questions or concerns on this matter, please do not hesitate to contact either myself or, Emily Slavik (519-825-4686)

Sincerely

Brian Locke
Manager
519-825-7711

4.6 Condition WE2

PI & Score	PI	Scoring issues / Scoring Guidepost Text	Score
	2.1.2	Issues at SG80 a. There is a partial strategy in place, if necessary, that is expected to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the fishery does not hinder their recovery and rebuilding. b. There is some objective basis for confidence that the partial strategy will work, based on some information directly about the fishery and/or species involved. c. There is some evidence that the partial strategy is being implemented successfully.	70
Justification	Main Retained species considered for the Walleye UoC are Lake whitefish and White bass. White bass is within limits. SIa. White bass does not have a TAC and catch is not limited. While its harvest may be constrained by the Walleye quota, the lack of a White bass quota means that it is not possible to conclude that the large mesh fishery maintains White bass catch at levels which are highly likely to be within biologically based limits. SIb. Due to the influence of other environmental factors, the partial strategy for Lake whitefish may not work. There is not a partial strategy for White bass. The fishery does not meet SG80 SIb. SIc. There is no evidence that the partial strategy for Lake whitefish is being implemented successfully. The White bass fishery does not have a partial strategy.		
Condition	By the fourth annual surveillance audit, there will be a partial strategy in place for managing the catch of Lake whitefish and White bass that is designed to ensure the large mesh fishery does not pose a risk of serious or irreversible harm to them.		
Milestones	By the first annual surveillance audit, the client will provide written evidence to the CAB showing that the issue of the by-catch of White bass and Lake whitefish in the large mesh fishery has been reviewed and there has been an options analysis of the management measures needed to ensure such that the fishery does not hinder the recovery and rebuilding of the Lake whitefish stock and may not hinder the recovery and rebuilding of the White bass stock. The required minimum score is 70. By the second annual surveillance audit, the client will provide written evidence to the CAB that the required partial strategies have been designed and steps have been taken towards their implementation. The required minimum score is 70. By the third annual surveillance audit, the client will provide written evidence to the CAB that the partial strategies are in place and there is some evidence that they are being implemented successfully. The required minimum score is 70. By the fourth annual surveillance audit, information about the fishery and/or the species involved will made available to the CAB by the client so that there is some objective basis for confidence that the partial strategy is working. The required minimum score is 80.		
Client action plan	These partial strategies will involve agencies and stakeholders from multiple LEC jurisdictions; therefore, therefore it is difficult to guarantee timelines for progress. It was proposed that the Lake Erie Committee (LEC) agencies will work cooperatively with the Lake whitefish and White bass fishery stakeholders to investigate moving forward with partial management strategies that will ensure that the fisheries do not pose a risk of serious or irreversible harm to Lake whitefish and White		

	bass in Lake Erie. As part of the development of multi-agency partial management strategies for Lake whitefish and White bass, it is proposed that consultations begin to co-operatively examine options for the assessment and management of Lake whitefish and White bass. Evidence of these consultations will be provided to the CAB by the first annual audit. It is proposed that the LEC agencies will come to an agreement on the preferred partial strategies for Lake whitefish and White bass assessment and management. Documentation of the partial strategy, including implementation plans, will be presented to the CAB by the second annual audit. It is proposed that the LEC agencies implement the partial strategies for Lake whitefish and White bass. Cooperatively, the OCFA and LEC will present the CAB with evidence that effective management measures will be in place such that the fishery does not pose a risk of serious or irreversible harm to Lake whitefish and White bass in Lake Erie by the third and fourth annual audits.
Progress on Condition [2016]	Evidence was provided[6] to show: LEC formed DDFWG to focus on development of partial harvest strategies for data deficient stocks including lake whitefish and white bass; DDFWG met twice via conference call until end August 2016; DDFWG has developed a preliminary SCA model for White Bass (see above WE1); the client is sponsoring a Ph.D. candidate Allan Debertin to develop stock assessment models for white bass; and inter-agency white bass data have been acquired and analyzed by Mr. Debertin as part of his Ph.D. thesis.
Status of condition [2016]	**Progress on this condition is behind schedule**. Although DDFWG has been formed, to-date the work has focused on lake whitefish (see above). Information on the sponsoring of a PhD candidate and acquiring data was made available during the assessment (Intertek 2015), and does not constitute progress in meeting the condition. As work on white bass has intensified, the auditors agreed to a revised schedule to meet the defined condition. This did not change the requirement to close the condition at the Year 4 surveillance audit. By the second annual surveillance audit, the client will provide written evidence to the CAB that the Lake Whitefish and White Bass assessment models have been completed and there have been simulations to test alternative models and identify a potential partial strategy required partial strategies have been designed and steps have been taken towards their implementation. The required minimum score is 70. By the third annual surveillance audit, the client will provide written evidence to the CAB that the partial strategies have been defined and are in place and there is some evidence that they are being implemented successfully. The required minimum score is 70. By the fourth annual surveillance audit, information about the fishery and/or the species involved will made available to the CAB by the client so that there is some objective basis for confidence that the partial strategy is working. The required minimum score is 80.
Client Submission (2017)	The client pre-audit submission was: • The LEC had previously formed a data-deficient fisheries working group (DDFWG) to commence projects focused on development of partial strategies for Lake Whitefish and White Bass

[6] Terms of Reference for the Data Deficient Fisheries Working Group (2015 April); DDFWG draft; a 2016 presentation to LEC and FMZ19 FAC with timelines a milestones to comply with conditions; Minutes of the 2016-03-24 meeting of Fisheries Management Zone 19 including notes on Commercial Fishery Walleye Transfers within MUs and expressing concerns for transfers between MU1 to MU3; Notes from Data Deficient Task Group telecom meeting in Dec 2 2015 including details on Lake whitefish modelling; Notes on DDFWG discussion on January 2016 at U of Guelph to review requirement to satisfy MSC conditions and progress; and Ontario Ministry of Natural Resources and Forestry (OMNRF). 2016. 2015 Status of Major Stocks Lake Erie Management Unit. The report includes Lake whitefish status indicating that in 2014 and 2015 there was no targeted effort and all Lake whitefish were harvested incidentally.

	• The DDFWG has completed a PSA for Lake Whitefish showing that risk of large mesh gill net fishery hindering recovery of Lake Whitefish is very low – MSC score >90 – therefore a partial strategy is not necessary to ensure the large mesh fishery is not hindering recovery of, nor posing a risk of serious or irreversible harm to, Lake Whitefish in Lake Erie • The DDFWG has completed a PSA for White Bass showing that risk of large mesh gill net fishery posing serious or irreversible harm to White Bass is very low – MSC score >90 – therefore a partial strategy is not necessary to ensure the large mesh fishery does not pose a risk of serious or irreversible harm to White Bass in Lake Erie • Based on this result, the client suggests that partial strategies are not necessary to maintain the main retained species at levels which are highly likely to be within biologically based limits, or to ensure the large mesh gill net fishery does not pose a risk of serious or irreversible harm or hinder their recovery and rebuilding. • Fishery-independent and fishery-dependent data show that White bass is stable in all QZs and a strong 2015 year class is coming in to the fishery (see: slides 111-118 in FMZ19_DEC8_2016_SOSv1.pdf • DDFWG has developed a preliminary SCA model but not yet sufficiently vetted for making inferences about stock status • OCFA is sponsoring a Ph.D. candidate Allan Debertin to develop stock assessment models for White Bass; however, his thesis work is on hold for an indeterminate time as he has taken a job with DFO in St. Andrews. • Documentation provided: April 2015 Terms of Reference Data Deficient Working Groups Draft_v6; Results of PSAs for Lake Whitefish and White bass with supporting files; 2016 LEMU Status of Major Stocks report to FMZ19 December 2016. • Revised schedule for meeting milestones: Milestones no longer applicable as the partial strategies are not deemed necessary.
Progress on Condition [2017]	1. This condition relates to the retained catch in the walleye large mesh gillnet fishery. 2. The condition articulates concern about the lack of a partial strategy to manage the impact that the fishery has on the Lake Erie populations of lake whitefish and white bass and that can hinder the recovery and rebuilding of stocks if appropriate. 3. Following the first annual surveillance audit the second year milestone was changed to "*the client will provide written evidence to the CAB that the Lake Whitefish and White Bass assessment models have been completed and there have been simulations to test alternative models and identify a potential partial strategy ~~required partial strategies have been designed~~ and steps have been taken towards ~~their~~ implementation*". 4. Note the edit of the milestone that was poorly redacted in the last report. 5. The progress on condition for WE1 provides evidence that the client has met the first part of the condition that relates to Lake whitefish. 6. On the basis of a PSA prepared for white bass (tables 16, 17 & 18), the client concluded that the fishery does not hinder its recovery and rebuilding.In the assessment (Scott et al 2015) evaluation of PI 2.1.1 resulted in a score of SG60 and SG80 as it was clear from the evidence that the species was within biological limits although noted that there was a lack of stock assessment 7. A conference call meeting of the DDWG on 25 September, 2017 (DDTG), concluded "*PSA results for White Bass indicate that the species is highly productive and with low to medium susceptibility scores. A statistical-catch-at-age model (2015) indicates a biomass that is high for the time series. There is agreement among the DDWG that on the basis of findings of PSA for WB and results of the preliminary SCAA analysis, it is concluded that that the large mesh gillnet fishery is expected to maintain the WB at levels which are highly likely to be within biologically based limits*". 8. The auditors note that while the client argues that productivity analysis indicates that white bass is not vulnerable to fishing, under the MSC approach to RBA for PI 2.1.1, the SICA score is the one used if the outcome of the analysis shows that a MSC equivalent score of 80 or 100. This is because the SICA provides

	quantitative analysis of the risk to the stock posed by the fishery as opposed to the vulnerability of the stock to all fisheries. While the client has provided information needed to complete a SICA, a SICA table (CC5 MSC Cr 1.3) was not presented. 9. Following auditor request for more evidence related to the biological status of white bass, the paper by Debertin *et al* (2017) was provided. It is noted that this is a draft submitted for publication in the CJFAS but has yet to be accepted and thus there is no confirmation of the outcome of a peer review. One of the stated objectives of this paper is to determine which "*model for …. white bass should be used to provide reliable biomass estimates*". This work was completed. 10. Information indicates that the white bass stock is at its highest level since the 1980s.
Status of condition [2017]	**Progress on this condition is behind schedule.** However, the client has provided evidence that: (i) a model for Lake Whitefish and a preliminary model for White bass have been developed, and (ii) that the stock of white bass is in excellent condition and at its highest since the 1980s. We consider that the redefined milestone for year 2 (the client will provide written evidence to the CAB that the Lake Whitefish and White Bass assessment models have been completed and there have been simulations to test alternative models) was inappropriate as it refers to outcome (PI 2.1.1) and not management (PI 2.1.2). **On that basis, and as allowed under MSC CR V2.0 Para 17.23.13.1b, the milestone for year 3 should be modified. The milestone for Year 4 should be retained.** By the third annual surveillance audit, the client will either (i) the client will present the CAB with evidence that the impact of the fishery on individual main retained species is negligible and that a partial strategy is not required; and / or (ii) provide written evidence to the CAB that a partial strategy have been defined and is in placem and there is some evidence that they are being implemented successfully. The required minimum score is 70. By the fourth annual surveillance audit, information about the fishery and/or the species involved will made available to the CAB by the client so that there is some objective basis for confidence that the partial strategy is working. The required minimum score is 80.

Table 13: White Bass: Susceptibility Worksheet (As prepared by the Data Deficient Working Group)

Low susceptibility (Low risk, score=1)	Medium susceptibility (Medium risk, score=1)	High susceptibility (High risk, score=1)		
<10%	10-30%	>30%	Majority of the Walleye gillnet effort occurs in the west (33%) and west-central basin (38%) (Walleye Task Group, 2017) and the walleye fishing effort is split between spring and fall fishery	Average large mesh gillnet effort (2012-2016) = 18,894 km with a min 16,122 km (2012) to max 22,921 km (2016). The % effort is highest in Q2 (39%) followed by Q1 (34%) with 26% of the effort spread across the large Q3. On average 70% of the effort across Lake Erie is directed towards Walleye; whereas on average 28% of the lakewide effort is targeting White Bass (high of 42% low of 17%). There is evidence to suggest prey switching as Walleye quota increase effort towards Walleye and decrease in targeted White Bass effort. In Q1 effort was highest in April/May (11% & 16%) and again in the fall (October, Novermber, December; 18%, 23%, 11% respectively). Effort in Q2 is highest in the spring and fall; March, April and May (12,16,11% respectively) and again in the fall - October and November (13%, 10% respectively). Commercial industry directs 40% more effort towards Walleye than White Bass
Low overlap with fishing gear (low encounterability)	Medium overlap with fishing gear	High overlap with the fishing gear (high encounterability)	Majority of targeted White Bass harvest occurs in Spring (April/May) in canned nets (~11 to 12%) and then again in fall (12-13%). highest White Bass harvest that occurs in west central basion (43%) and west basin (36%) (Status of Stocks, 2015). 2013 Bycatch Assessment project for the west basin and central basin observed the reported White Bass harvest in Walleye gillnets is >= 30%	
A. Individual <size at maturity are rarely caught	A. Individual <size at maturity are regularly caught	A. Individual <size at maturity are frequently caught	Harvest at age may depend on year class strength. In 2015, the White Bass harvest dominated by age 3 in the spring/summer west basin and ages 3 and 4 in the central basin summer harvest and west basin fall harvest; however, 2014 fall harvest in the west and west central basin was dominated by age 2 (2014 & 2015 Status of Stocks). Over the past 5 years (2012-2016); average size WB caught in commercial fishery was 335 mm (33.5 cm); with the majority (77%) being >316 mm (31.6 cm) or 95% maturity	
Individual <size at maturity can escape or avoid gear	Individual < half the size at maturity can escape or avoid gear	Individual < half the size at maturity are retained by gear		
Evidence of majority released postcapture and survival	Evidence of some released postcapture and survival	Retained species or majority dead when released	This is a retained species	

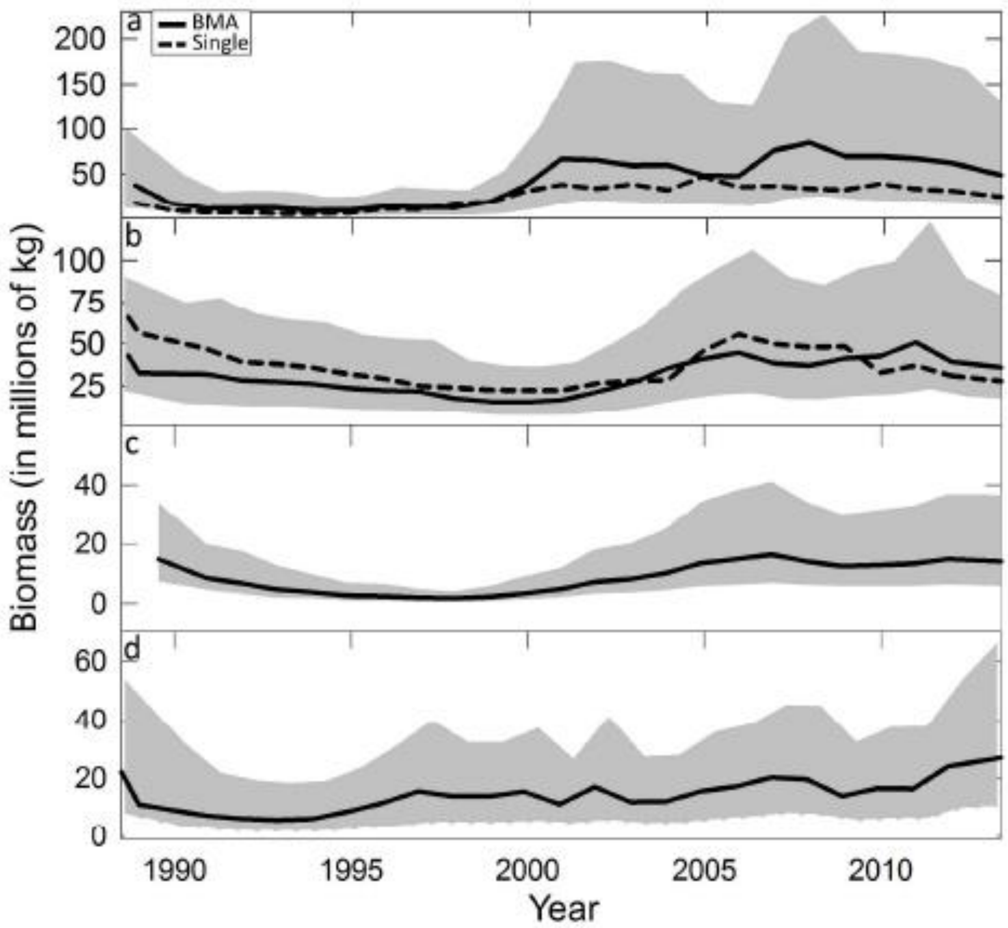
Table 14: White Bass: Productivity Worksheet (As prepared by the Data Deficient Working Group)

White Bass				
Productivity determinant	High Productivity (Low risk, score=1)	Medium Productivity (medium risk, score=2)	Low Productivity (high risk, score=3)	
Average age at maturity	<5	5-15 years	>15 years	Age at maturity 3 (Corker et al 2001). Van Oosten study, majority of the Lake Erie did not sexually mature until age 3 (Scott and Crossman pg 691). based on the percentage of White Bass mature by pooled sex and age for early (1989-1999) = age 3 (94%), age 4 (99%) and age 5 (100%) and recent (2000-2016) time periods age 2 (97%) and age 3 (100%). Ages based on fall collection in the west and central basin surveys.
Average maximum age	<10 years	10-25 years	>25 years	This species does not live long and seldom lives beyond age 7 (Scott and Crossman pg 691)
Fecundity	>20,000 eggs per year	100, 20,000 eggs per year	<100 eggs per year	Number of eggs varied from 242,000 to 933,000 and averaged 565,000 (Scott and Crossman)
Average maximum size	<100 cm	100-300 cm	>300 cm	2016 Partnership data (Catch rate cm/gang) size of older fish between 30 and 40 cm
Average size at maturity	<40 cm	40-200 cm	>200 cm	Van Oosten study, majority of the Lake Erie did not sexually mature until age 3, when they averaged 10.9 inches (277 mm) total length (Scott and Crossman pg 691). based on the Lake Erie west and central basin Partnership surveys data - Length at 50% maturity for males was 23.0 cm (1989-1999), 21.3 cm (2000-2016) and for females was 25.5cm (1989-1999) and 26.3 cm (2000-2015) respectively.
Reproductive strategy	Broadcast spawner	Demersal egg layer	Live bearer	Nonguarder: Open substratum spawner: Phyto-lithophils (Corker et al, 2001)
Trophic level	<2.75	2.75-3.25	>3.25	Trophic Level (Ref. 69278): 4.0 ±0.68 se; Based on food items.(www.fishbase.org, website accessed April 27, 2017)

Table 15: Lake Whitefish & White Bass: PSA Analysis (As prepared by the Data Deficient Working Group)

						Productivity Scores [1-3]								Susceptibility Scores [1-3]					1.1.1 only					PSA scores (automatic)			
PI	TAXA_NAME	FAMILY_NAME	SCIENTIFIC_NAME	COMMON_NAME	GEAR_TYPE (1.1.1)	Average age at maturity	Average max age	Fecundity	Average max size	Average size at Maturity	Reproductive strategy	Trophic level (fishbase)	Total Productivity (average)	Availability	Encounterability	Selectivity	Post-capture mortality	Total (multiplicative)	Catch (tons) (1.1.1)	Weighting (1.1.1)	Weighted Total	Weigted average	Color on PSA plot	PSA Score	MSC Score	Risk Category Name	MSC scoring guidepost
2.2.1		Salmonidae	*Coregonus clupeaformis*	Lake Whitefish	largemesh gillnet	1	2	1	1	1	2	2	1.43	2	2	1	3	1.28	NA	NA	NA	NA		1.91	96.2	Low	>80
2.2.1		Moronidae	*Morone chrysops*	White Bass	largemesh gillnet	1	1	1	1	1	2	3	1.43	3	2	2	3	1.88	NA	NA	NA	NA		2.36	87.9	Low	>80

<u>Figure 1: White Bass: Time Series of Biomass</u>



Time-series biomass estimates of Lake Erie a) yellow perch, b) walleye, c) white perch, and d) white bass biomass from Bayesian model averaging (BMA). The black lines and grey background denote the BMA mean estimate, and 2.5% and 97.5% credible intervals (BMA), respectively. The hatched lines (Single) denote the mean biomass estimate derived from the Yellow Perch Task Group (Belore et al. 2014) and Walleye Task Group (Wills et al. 2014) statistical catch-at-age models currently used by government agencies.
Figure 4

Source: Debertin *et al* 2017

5 RECOMMENDATIONS

5.1 Yellow Perch

1. **To ensure correct information is available to managers, the audit team recommends that OCFA and OMNR work together to design and implement a data system that provides consistently accurate data, and the data on catch, retained catch and by-catch is published and made available to stakeholders on a regular basis.**

Year 1. Information (data on retained catch and by-catch) was provided by the client to indicate that the recommendation has been addressed. The data, which applies to the Ontario Yellow Perch and Walleye gill net fisheries, is not available in published reports.

Year 2. Accurate data is now available for Ontario.

2. **The Canadian distribution of Spotted sucker is limited to south western Ontario, where it occurs in the western basin of Lake Erie. Because of its low abundance it is unlikely that the species is caught in the gill net fisheries. Nevertheless, it would not be possible to corroborate this from DCRs as suckers are reported as one group. In the last 10 years, the by-catch of suckers in the fishery was 13,079 lbs. While discards were likely under reported until 2011, since then over 3,000 lbs have been removed annually. Removals can be significant for some sucker populations but information to determine the status of species in the group as main bycatch is missing. However future annual audits should review the situation to ensure that by-catch does not pose a threat to sucker species and it is recommended that data be taken on species composition to allow this to be considered in future annual audits.**

Year 1. This recommendation relates to the by-catch in the yellow perch gill net fishery. Documentation was provided as evidence that the client is addressing the issue of improving classification of suckers.

Year 2. Item 1 of the 2017 Captains' and Designates' Meetings 2017 (LEMU 2017b) on MSC covers the recommendation i.e.

- Suckers
- MSC certification process identified a need to better understand the amount of by-catch of certain species of Suckers in the small mesh and large mesh gill net fishery
- The MSC process also identified a need to ensure that by-catch of Suckers does not pose a threat to rare Sucker species and recommended that data be collected on species composition;
- Further, the MSC certification process identified a need to (eventually) identify individual species of the Sucker family.

Addressing the issues related to Suckers on the DCR in 2O17

- Separate 'Common White Suckers'from other suckers and write this on the DCR in pounds;
- All other Suckers should be recorded as 'Suckers' and reported on the DCR in pounds - if you are already breaking down suckers by their species on the DCR continue to do so, if DCR space allows;
- This is the first step in addressing the recommendations from the MSC certification - there will be further steps as we move forward to identify and record other types of Suckers, such as Redhorses and Spotted Sucker, which have been identified as 'special Concern' under Ontario's Endangered Species Act

3. **While the assessment team did not identify main by-catch species in any of the QZs it was noted that DCRs do not identify individual species of the sucker family, some of which could be vulnerable. Further, there are Species of Concern in the area that could be part of the by-catch. It is recommended that to support the annual surveillance program, OCFA and OMNR should work to modify the reporting protocol so that sucker species are individually recorded.**

Year 1. This recommendation relates to by-catch in the Yellow perch gill net fishery and applies to all sucker species (not only to threatened species as stressed in recommendation 2). Evidence was provided that the client is addressing improvement in the classification of suckers (see recommendation 2).

This recommendation is relevant due to the increase in the catch of suckers in 2014 and 2015. (the rational in the main assessment (Interek 2015) for PI 2.2.2, SIa the CAB stated the scores for lake sturgeon, lake trout and sucker species may need to be considered if their share in the annual catch was to increase

Year 2. The annual average catch of Lake sturgeon in QZ1 is about 3 lbs, in QZ3W about 4 lbs, and only sporadic in QZ3E over a 10 year period. This is in small quantity and for the moment it is not regarded as a main species; but future annual audits should review the situation to ensure that the by-catch has not increased to pose a threat to the recovery of the stock.

Year 1. This recommendation relates to by-catch in the Yellow perch gill net fishery. Catch of Lake sturgeon has increased in the fishery but remains limited.

4. **Currently, there is no information on size of Lake Sturgeon; and it is recommended that data should be collected to allow this to be considered in future annual audits.**

Year 1. This recommendation relates to by-catch in the Yellow perch gill net fishery. No progress.

Year 2. Item 2 of the 2017 Captains' and Designates' Meetings 2017 (LEMU 2017b) on MSC covers the recommendation i.e.

- Lake Sturgeon
- MSC certification recommended that the by-catch of Lake Sturgeon should be monitored to ensure that by-catch has not increased to pose a threat to the recovery ofthe stock
- MSC also identified that there is currently no information on the size of Lake Sturgeon and recommended that data should be collected to allow this to be considered in future audits
- Addressing the issues related to Lake Sturgeon on the DCR:
    - Continue to report released and surrendered Sturgeon in numbers on the DCR;
    - Also, please record the amount of Sturgeon in pounds in the Comments section

5. **Lake trout is a non-harvest species recorded in the last three years in small quantities. It is not considered a main species. Future annual audits should review the situation to ensure that the by-catch has not increased to pose a threat to the recovery of the stock. Lake sturgeon was recorded as by-catch in one year (2006). It is not considered a main species.**

Year 1. This recommendation relates to by-catch in the Yellow perch gill net fishery. By-catch of Lake trout in 2014 and 2015 was 15.5 lbs and 1 lb in QZ2; 11.7lbs and 37.5 lbs in QZ3E; and 1 lb and 10.8 lbs in QZ3W. This has not exceeded the maximum observed of 78 lbs in 2012 in QZ3E.

Year 2. The DDWG has completed substantial work on Lake trout

6. **Future annual audits should review the situation to ensure that the by-catch of Lake trout has not increased to pose a threat to the recovery of the stock.**

Year 1. See R5.

Year 2. See R5.

6 SUMMARY OF FINDINGS

Table 7: Summary of Status of Conditions at end-Second Surveillance Audit

Condition number	Status		
YP1	Behind Schedule	On Schedule	Ahead of Schedule
YP2	Behind Schedule	On Schedule	Ahead of Schedule
YP3	Behind Schedule	On Schedule	Ahead of Schedule
YP4	Behind Schedule	On Schedule	Ahead of Schedule
WE 1	Behind Schedule	On Schedule	Ahead of Schedule
WE 2	Behind Schedule	On Schedule	Ahead of Schedule

7 CONCLUSION

The Lake Erie Multi-species Commercial Fishery is certified according to the MSC standard for sustainable fisheries until 19 th August, 2020. Six conditions to the certification are open. For reasons as justified in the text above, the milestones have been redefined for the behind schedule conditions as allowed by MSC CR 2.0 Para 7.23.

8 REFERENCES

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9 APPENDIX 1 – RE-SCORING EVALUATION TABLES

None

10 APPENDIX 2 – STAKEHOLDER COMMENTS

No comments were received.

11 APPENDIX 3- SURVEILLANCE AUDIT INFORMATION

None

12 APPENDIX 4 - ADDITIONAL DETAIL ON CONDITIONS/ ACTIONS

None

13 APPENDIX 5 - REVISED SURVEILLANCE PROGRAM

None