Harvest Assessment Review Implementation Completion Report

Standing Technical Committee Report submitted to
The Lake Erie Committee
03/07/2007

During the winter of 2004-2005, at the request of the Lake Erie Committee (LEC), the Great Lakes Fishery Commission (GLFC) assembled a panel of experts charged with evaluation of the efficacy, precision and accuracy of current techniques used to estimate total percid harvest and harvest at age by sport and commercial fisheries in Lake Erie, and to recommend improvements. Each Lake Erie jurisdiction (Ohio, Michigan, Pennsylvania, New York and Ontario) documented details of their harvest assessment program and provided this to the panel members. The panel members then met to discuss issues, develop recommendations and assemble a report of their findings for release to the LEC in March, 2005 (Lester et al. 2005).

Overall the panel felt that the methodology used by each agency to estimate percid harvest were sound. Agencies employ creel survey techniques based upon probability sampling to estimate sport fishery harvest. Commercial fishery percid harvest assessment was deemed sound as it is based upon mandatory reporting, therefore, all recommendations are directed at sport fishery harvest assessment methods. The panel did feel that current methods may result in a slight underestimate of percid harvest. The panel made twelve recommendations for addressing this bias in sport fishery harvest assessment, and those recommendations follow:

1. Report released fish;
2. Estimate latent mortality;
3. Measure subordinate fisheries;
4. Correct designs for haphazard sampling of biological components;
5. Use otoliths for age determination;
6. Implement a coordinated approach with neighboring jurisdictions;
7. Mandatory reporting for charter fisheries;
8. Account for the magnitude of illegal removals;
9. Correct designs for unequal probability sampling;
10. Address bias introduced from depensatory sampling;
11. Test assumptions periodically using independent survey methodology;
12. Explore data for restratification;

For each agency and the LEC as a whole, below we will address progress that has been made over the past year on each of the recommendations.

1. Report Released Fish

The panel recommended that all surveys should be designed so that estimates of the number of released fish could be obtained, and recognized that most surveys were

designed with these objectives in mind. All agencies currently estimate the number of walleye that are released by the recreational fishery and in cases where jurisdictions have minimum size limits, the percentage of released fish that are sublegal (e.g. < 15") are also estimated. Due to size-based fishing regulations in all jurisdictions, walleye release rates are highly variable and dependent upon the abundance of the incoming year-class of fish as well as growth rates (Table 1). For example, after implementation of the 15" MSL for walleye in Ohio in 2003, anglers released an estimated 153,000 walleye, with the majority of the fish being under the MSL. The 2001 year-class was relatively strong, but did not comprise a large percentage of the fishable population in 2003, as additional legal-sized year-classes were present in the population. In contrast, Ohio anglers released an estimated 700,000 walleye in 2005 with the majority being sublegal sized fish from the 2003 yearclass. Age-2 fish comprised 82% of the total adult walleye population in 2003, while only 58% of the population in 2003. Additionally, in 2005, anglers released approximately 50% of the walleye caught in Ohio waters, while in 2003 anglers released only 10% of the walleye caught in Ohio waters. Similar trends are present for the New York sport fishery. Percentages of released fishes vary significantly by jurisdiction as well, with a relatively low number of released fish in New York waters, and much more fish released in Ohio waters of Lake Erie, due primarily to a prevalence of young fish and much higher angling effort. Across the three years, Ohio anglers averaged 400,000 released walleye per year, while New York anglers released an average of 8,000 walleye per year.

Table 1. Estimated number of released walleye by Ohio and New York sport anglers, 2003-2005.

Walleye Sport Fishery			
	OH released	NY released	OH+NY released
2003	152,019	1,575	153,594
2004	447,897	1,324	449,221
2005	699,437	20,717	720,154

For yellow perch, the number of fish caught versus those harvested is estimated by Ohio, Ontario, New York and Pennsylvania, however, this information may be biased due to angler behavior and studies that independently validate angler reported catch rates versus harvest rate have not been conducted on Lake Erie yellow perch. Similar to walleye, the release rates are highly variable and dependent upon the abundance of the incoming year-class (Table 2), with anglers releasing 25% and 34% of the yellow perch caught in Ohio waters in 2003 and 2005, respectively. Release rates of yellow perch from Long Point Bay, Ontario are slightly higher, averaging 60% from 1984-2004. In Ohio, New York, and Ontario waters of Lake Erie, an estimated 2.5-3.0 million yellow perch were caught and released annually from 2003-2005.

Table 2. Estimated number of released yellow perch by Ohio, New York, and Ontario (Long Point Bay) sport anglers, 2002-2005.

Yellow Perch Sport Fishery			
year	OH released	NY released	ON Long Point Released
2002		9,142	6,778
2003	2,419,868	4,957	5,292
2004	2,457,958	20,757	1,904
2005	3,046,078	20,097	
2006	1,095,728	7,054	

Estimates of released yellow perch were also compiled by management unit. Reports of released fish for Management Units 1 and 2 were derived from Ohio Department of Natural Resources creel surveys only, Management Unit 3 estimates were derived from Ohio Department of Natural Resources and Pennsylvania Fish and Boat Commission creel surveys, and estimates of released yellow perch in Management Unit 4 were derived from Pennsylvania Fish and Boat Commission and New York State Department of Environmental Conservation (Table 3).

Table 3. Estimated number of released yellow perch sport anglers by management unit, 2002-2006.

Yellow Perch Sport Fishery				
Year	**Management Unit 1**	**Management Unit 2**	**Management Unit 3**	**Management Unit 4**
2002				9,142
2003	1,555,054	715,692	149,122	4,957
2004	1,387,136	1,010,349	203,501	52,462
2005	1,390,657	1,380,503	274,918	20,097
2006	606,720	389,760	99,248	7,054

Average number of yellow perch released in Management Units 1 and 2 (Ohio sport anglers only) was 1.2 million and 0.874 million fish, respectively. Average number of yellow perch released in Management Unit 3 (Ohio and Pennsylvania sport anglers only) was 0.181 million fish, while average number of yellow perch released in Management Unit 4 (Pennsylvania and New York sport anglers only) was 14,723.

2. Estimate Latent Mortality

The panel recommended that agencies should include as "harvest" those fish that are released and subsequently die as a result of being captured. Currently, no agency estimates latent mortality of released fish nor do agencies account for release mortality in harvest estimates. As such, all agencies assume that no latent mortality of released fishes occurs. No studies of hooking mortality have been conducted on Lake Erie percids, however, several investigators have quantified walleye hooking mortality in other systems. Walleye hooking mortality rates have ranged from 0-16% (Fletcher 1987; Payer et al. 1989; Schaefer 1989; Parks and Krai 1991; Sullivan 2003). Average hooking related mortality from these studies is approximately 3%, however, latent mortality rates in Lake Erie may differ significantly associated with angling method (trolling vs. casting) and hooking depth. Using current estimates and the best available information (400,000 walleye released * 0.03 mortality rate), annual mortality associated with latent hooking mortality is approximately 12,000 walleye.

Few hooking mortality studies have been conducted on yellow perch. One study, that examined decompression mortality, found that latent mortality (3 d) due to decompression ranged from 10-33% (Keniry et al 1996). However, of the fish that were alive after three days, 65-70% were still floating on the surface. In this study, fish were housed in indoor raceways, protecting them from waterbird predation. In most systems, intense waterbird predation would likely occur on these floating fish. If decompression is the dominant factor associated with perch hooking mortality (predation or otherwise), this study suggests that latent hooking/decompression mortality of yellow perch could be as high as 80%. Again, the number of released yellow perch will likely be largely dependent on the size of the incoming year-class. Given the above information, annual latent mortality for yellow perch was estimated at 120,000, 87,400, 18,100, and 1,472 for Management Units 1, 2, 3, and 4, respectively. Because the yellow perch quota is allocated in pounds, an average weight of released fish needs to be quantified. Without this information in hand, it is reasonable to assume that most released fish are generally age-2 (new recruits entering the fishery). The average weight of age-2 yellow perch in each management unit is listed below (Table 4). An estimated weight of released yellow perch that die from latent mortality is 17,000, 12,000, 1,750, and 180 pounds in Management Units 1, 2, 3, and 4 respectively.

Table 4. Estimated mean weight at age for yellow perch by management unit, 2006 (YPTG 2007)

	Mean Weight (kg)			
Age	Management Unit 1	Management Unit 2	Management Unit 3	Management Unit 4
2	0.054	0.061	0.044	0.056
3	0.091	0.099	0.100	0.159
4	0.114	0.135	0.134	0.240
5	0.152	0.227	0.219	0.276
6+	0.224	0.337	0.345	0.332

3. Measure Subordinate Fishery Harvest

The panel recommended that agencies should account for all sources of removals, including subordinate fisheries, as well as unreported landings and discard mortality from the commercial fishery. The panel recommended that it was appropriate to use a rough estimate for each fishery for a period of years, and then revisit periodically. Most agencies either currently, or historically capture information on subordinate fisheries in their jurisdictional waters. For example, Ohio has periodically surveyed the spring walleye fisheries since 1975, and annually surveyed this fishery since 2001. New York, Ontario, and Ohio have periodically surveyed ice fisheries, as well as shoreline fisheries a number of times over the past two decades (Table 4). New York began periodically surveying it's nighttime walleye fishery beginning in 1993. Individually, these fisheries comprise a very small percentage of the total harvest (Ohio tributary harvest is 1-5% of total Ohio harvest), but in combination with other subordinate fisheries, they can comprise a significant portion of the harvest (total subordinate fishery harvest is 5-10% of estimated lake harvest for Ohio walleyes). The most significant fisheries that are not included in the models are the Ohio tributary harvest and cross-jurisdictional landings (~30,000 and 130,000 walleye, respectively).

Table 4. Estimated walleye harvest (numbers) from subordinate fisheries, 1975-2005.

	Walleye				
Year	Measured Tributary Harvest	Measured Cross-jurisdiction Harvest	Measured Ice Fishery Harvest	Measured Shoreline Harvest	NY Nighttime Harvest
1975	25,200				
1976	16,567		18		
1977	17,645		25		
1978	32,036				
1979	41,826				
1980	42,689				
1981	23,595			1,209	
1982	40,956			1,902	
1983				19,753	
1984	32,639			16,351	
1987*	69,871				
1988					
1989			3,595		
1990	94,407		105		
1991			1,779		
1993	25,248			1,097	2,038
1994		9,507			815
1995		15,644			545
1996		8,853			174
1997	57,218	10,798			611
1998*	7,849	18,153			
1999		9,604			
2000		50,444			
2001	36,682	20,601			
2002	37,509	14,728			
2003	39,410	25,428			
2004**	32,111	135,508			
2005**	30,815	35,935			
2006**	35,063	35,604			
Mean	**36,856**	**29,024**	**1,104**	**8,062**	**837**

* In 1987 only Maumee River harvest measured

* In 1998 only Sandusky River harvest measured

* In 2004,2005, and 2006 cross-jurisdictional landings from OH waters to MI landings included

Significant yellow perch subordinate fisheries include an ice fishery, Long Point Bay fishery, and a shoreline fishery (Table 5) although the Long Point Bay fishery is not currently included in the international TAC setting process. All of these fisheries have been surveyed periodically by agencies, with total landings averaging 200,000 and

300,000 fish harvested from the Long Point Bay ice fishery and the Ohio shoreline fishery, respectively. The only agencies that have periodically measured shoreline harvest are ODNR and NYSDEC, and harvest from each management unit is summarized for surveyed years in Table 6. Estimates of total biomass harvested from these fisheries is presented from previously summarized information.

Table 5. Estimated yellow perch harvest (numbers) from subordinate fisheries, 1975-2005.

	Yellow Perch			
Year	Measured Cross-jurisdiction Harvest	Measured Ice Fishery Harvest (OH)	Measured Ice Fishery Harvest (LPB)	Measured Shoreline Harvest
1975		23,022		
1976		41,617		
1977		162,393		
1978			120,813	
1979			314,600	
1980			264,219	
1981				289,751
1982			401,727	425,629
1983				438,304
1984		49,484*	275,954	332,764
1985			18,973	
1986			115,382	
1987				
1988			39,014	
1989		4,721		
1990		61		
1991		166		
1993				31,012
1994	44			
1995	5,185			
1996	5,943			
1997	912			
1998	8,186			
1999	4,988			
2000	13,022			
2001	4,330			
2002	12,699			
2003	5,757			
2004	10,859		236,052	
Mean	**6,539**	**38,663**	**198,522**	**303,492**

* New York ice fishery harvest

Table 6. Summer shoreline harvest (numbers) of yellow perch in waters of Lake Erie, by management unit (Ohio and New York sport anglers only).

Year	Management Unit 1	Management Unit 2	Management Unit 3	Management Unit 4
1981	204,689	44,458	40,604	
1982	285,814	117,044	22,771	
1983	275,375	124,699	38,230	
1984	223,677	83,564	15,893	9,630
1993	13,789	12,286	4,837	

Average harvest by Ohio's shoreline anglers in years when the shoreline creel was conducted were 200,000, 76,000, and 24,000 yellow perch in Management Units 1, 2, and 3, respectively, while New York shoreline anglers harvested 9,630 yellow perch in 1984. Average annual harvest (pounds) from shoreline anglers was 39,229, 24,406, 8,156, and 1,107 in Management Units 1, 2, 3, and 4, respectively

Of the subordinate fishery harvest, Ohio annually measures harvest from the spring tributary fisheries and other agencies periodically measure components of their subordinate fisheries (e.g. Detroit River, ice fishery, nighttime fishery). In response to the recommendation of the panel, Ohio and Michigan, and Ohio and Ontario are currently accounting for cross-jurisdictional landings using some minor modifications of existing creel surveys. For example, anglers landing in Michigan, but fishing in Ohio waters previously were not accounted for in the Michigan creel surveys. With modifications in the creel survey design, anglers fishing in Ohio, but landing in Michigan are currently counted through the MDNR interview process, and catch rates and effort estimates from the same statistical grids are applied to anglers landing in Michigan to estimate harvest of this component from the fishery. Anglers fishing in Ontario waters of Lake Erie, and landing in Ohio have always been included in the ODNR creel survey design, however, harvest estimates were not reported, nor accounted for in the quota management system. In addition to these changes, based upon recommendations from the Blue Ribbon panel, ODNR initiated a shoreline creel program in 2006 to update estimates of total percid harvest associated with this fishery.

4. Correct Survey Designs for Haphazard Sampling

The review panel recommended that in instances when true random sampling cannot be achieved (i.e. interviews, fish lengths etc.), an alternative, statistically sound sampling procedure be implemented and documented. In some cases, agencies currently instruct creel clerks to interview returning anglers systematically (i.e. OMNR and NYSDEC – every 2nd or 3rd returning boat). In other cases, due to access issues, systematically interviewing boats returning to dispersed or large harbors would be extremely difficult (i.e. Ohio harbors are extremely large, therefore finding and identifying every 3rd boat entering would be difficult). To address haphazard interview sampling, MDNR implemented improved training of creel clerks in 2004 that includes manual and verbal instructions to interview anglers randomly or systematically. Beginning in 2005, as a response to panel recommendations, New York published a

detailed report of standard creel survey procedures for distribution to creel clerks during the annual training period. In Ohio, creel clerks are explicitly instructed to interview anglers randomly.

In most jurisdictions with respect to biological sampling (lengths), creel clerks are instructed to collect length information on all fish contained in each cooler, rather than a subsample. In Michigan, Pennsylvania, and Ontario, all fish from each interviewed angler are measured. These changes should effectively address concerns regarding haphazard sampling.

5. Use Otoliths for Age Determination

The review panel recommended that agencies use otoliths for assigning ages to fish sampled in the fishery because scale-based ages typically underestimate the ages of older fish. For walleye, all agencies currently have implemented otoliths as the primary ageing structure. In New York, otolith samples and other biological data from harvested walleye are collected as an independent sampling effort at sport fishery cleaning stations at selected locations, as it remains impractical for creel clerks to extract otoliths during standard interviews. For yellow perch, OMNR and ODNR implemented otoliths as the primary ageing structure in 2005, while NYSDEC and MDNR use anal spines for ageing yellow perch. In several studies, including one on Lake Erie (Chris Vandergoot, pers. comm.), anal spines were found to be nearly as precise as otoliths, and better than scales for estimating ages of older fish.

6. Implement Coordinated Approach to Harvest Estimation

The review panel recognized that, in the past, agencies have operated independently in designing and conducting creel surveys. The panel stated that this independent approach has costs and that a more coordinated approach (design globally, implement locally) would have important benefits and recommends development of a lakewide operational plan which would document agency specific and interagency plans for creel assessment. To date, the Lake Erie agencies have begun working more in partnership to assess Lake Erie percid harvest. For example, MDNR and ODNR personnel are working together to better characterize inter-jurisdictional landings and incorporate these into harvest strategies. To date, a lakewide operational plan has not been developed, however, this document serves to consolidate all agency harvest assessment programs and document progress made related to coordinated sampling.

7. Mandatory Charter Reporting System

The review panel recommended that charter operators be treated as commercial fishers and that mandatory reporting of their harvest should be a condition of the license. Currently, only MDNR has a mandatory charter reporting system in place, with other agencies characterizing charter harvest as a part of the standard creel survey methodology (with charter fishing being a separate strata). Agencies that do not currently have mandatory reporting for charter operators do not plan to implement mandatory reporting in the near future for several reasons. First, the size of the charter fleet in some

jurisdictions (i.e. Ohio has ~800 operators) presents significant logistical constraints with respect to managing any mandatory charter reporting system. Secondly, some agencies formerly implemented a mandatory reporting system (i.e. ODNR in the 1980s), however, the reliability of the reports were suspect and enforcement of penalties was quite difficult. ODNR felt that the accuracy and precision of the charter fishery harvest was captured more effectively and efficiently in the current creel survey design and thus dropped the mandatory reporting system.

8. Account for Illegal Landings

The review panel also recommended that illegal landings be accounted for in harvest estimates. Admittedly, it may be possible to estimate illegal landings based upon some estimate of enforcement encounters of illegal harvest versus contacts in the recreational fishery, however, these estimates would be difficult to obtain due to extenuating circumstances (Halliday et al. 2001). Estimates of illegal landings or discard mortality in the commercial fishery would be virtually impossible to obtain because of changes in fisher behavior (Halliday et al. 2001). Therefore, most agencies do not have a means for estimating illegal landings of percids from Lake Erie.

9. Correct Survey Designs for Unequal Probability Sampling

The review panel recommended that the estimation procedures for the Ohio creel survey be modified to account for unequal sampling probabilities. For example, in the Ohio access-access creel survey the early-day Period A covered the hours of 1000-1800, while the late-day Period B covered the hours of 1200-2000. Since Period A and Period B sample times overlapped (1200-1800), the hours from 1000-1200 and 1800-2000 were effectively sampled with a lower probability than those from the middle of the day (1200-1800). The panel recommended that the estimation procedures should be adjusted for this unequal probability sampling method (Pollock et al. 1994). The Ohio creel survey is currently being evaluated to account for unequal sampling probabilities and creel estimates from 2006 will be corrected for this unequal sampling probability. The analysis and implementation of this recommendation will be provided as an addendum to this report.

10. Evaluate and Correct Surveys for Depensatory Sampling

The review panel noted that most of the "access-access" surveys in Lake Erie involved a prioritization of data collection when sampling access locations, with highest priority assigned to counting of fishing boats returning to harbor, then interviewing boat-parties, and finally sampling fish. The impact of this prioritization on estimates is to interview parties and measure catch more heavily during periods of low fishing activity, and a bias in parameter estimates could result. This type of sampling is called depensatory sampling in that sample sizes actually decrease with increasing population size. The review panel recommended that agencies evaluate the extent and nature of this problem and correct parameter estimates/survey designs if the problem is significant.

In MDNR creel surveys, monthly biological data sample sizes are proportional to monthly effort, thereby promoting greater sampling during the peak fishing months. MDNR personnel also provide specific instructions at clerk training sessions that emphasize the need to obtain as many interviews/biological data samples as possible on high activity days. In NYSDEC creel surveys, some degree of depensatory sampling has historically occurred. To address this issue, in 2005, NYSDEC changed the creel survey protocol such that security cameras were used to remotely log boat counts, thus releasing creel clerks to collect interview samples in direct proportion to angling activity. In OMNR creel surveys, saturation typically does not occur as OMNR uses a security cameral to log boat counts during periods of high activity. Additionally, interview and biological data are collected with a crew of two creel clerks to minimize bias associated with depensatory sampling. In PFBC creel surveys, saturation, and potential depensatory sampling has occurred infrequently. However, PFBC biologists do not feel that depensatory sampling bias is large and do not account for it.

In ODNR creel surveys, the potential for landing rates to exceed the maximum sampling rate for the creel clerks exists, particularly for yellow perch, for which there is a relatively high bag limit (40 fish/day). In order to further examine the potential for bias associated with depensatory sampling, the ODNR creel survey data from 2004 were examined. Initial examination of ODNR creel survey data from 2004 indicates that for both walleye and yellow perch, monthly length samples are generally proportional to monthly estimated harvest rates (Figure 1 and 2).

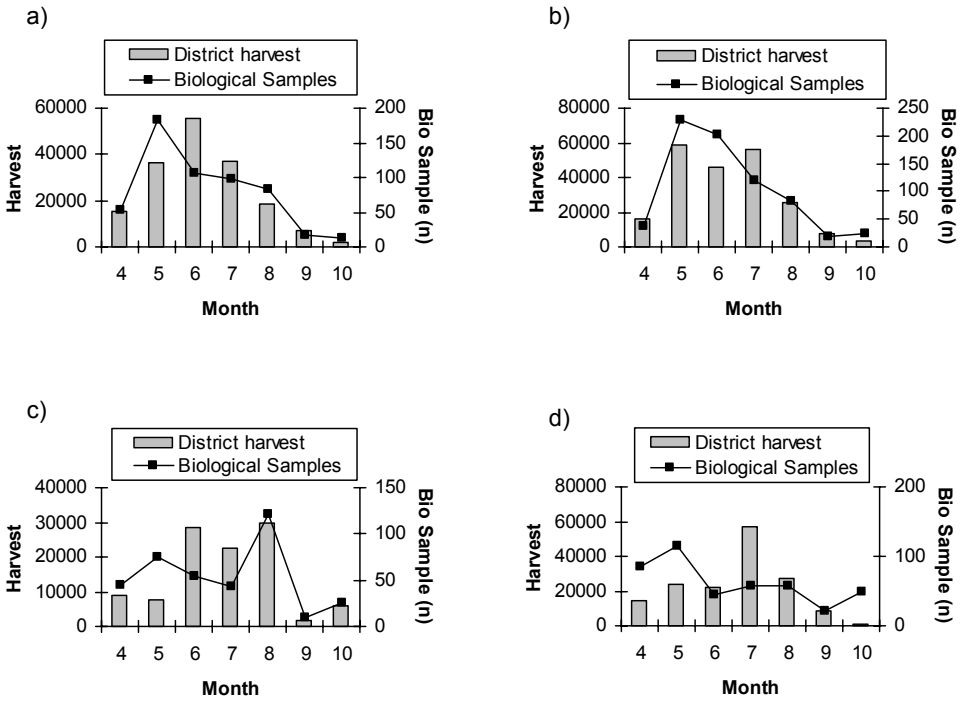

Figure 1. Estimated harvest (numbers) and biological sample sizes for walleye in Management Unit 1 on weekdays (a) and weekends (b), and in Management Unit 2 on weekdays (c) and weekends (d), 2004.

For walleye, in 2004, harvest estimates were slightly higher for weekend strata, relative to weekday strata in all Districts. Biological samples were collected in similar proportion between weekend and weekday strata, with approximately 1.5% of the harvest sampled during weekday strata and 1% of the harvest sampled for biological information during weekend strata (Figure 3). For walleye, there was little evidence of depensatory sampling as correlation coefficients of estimated harvest by district and strata versus proportion of the landings sampled for biological information ranging from -0.24 - -0.74, with none of the correlations being statistically significant in 2004.

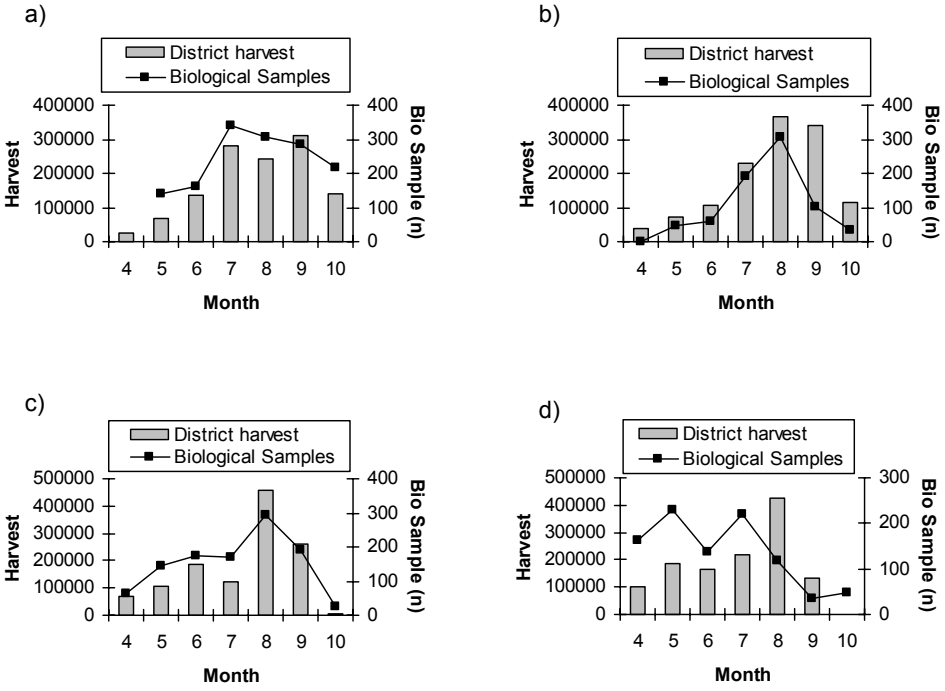

Figure 2. Estimated harvest numbers and biological sample sizes yellow perch in Management Unit 1 on weekdays (a) and weekends (b), and in Management Unit 2 on weekdays (c) and weekends (d), 2004.

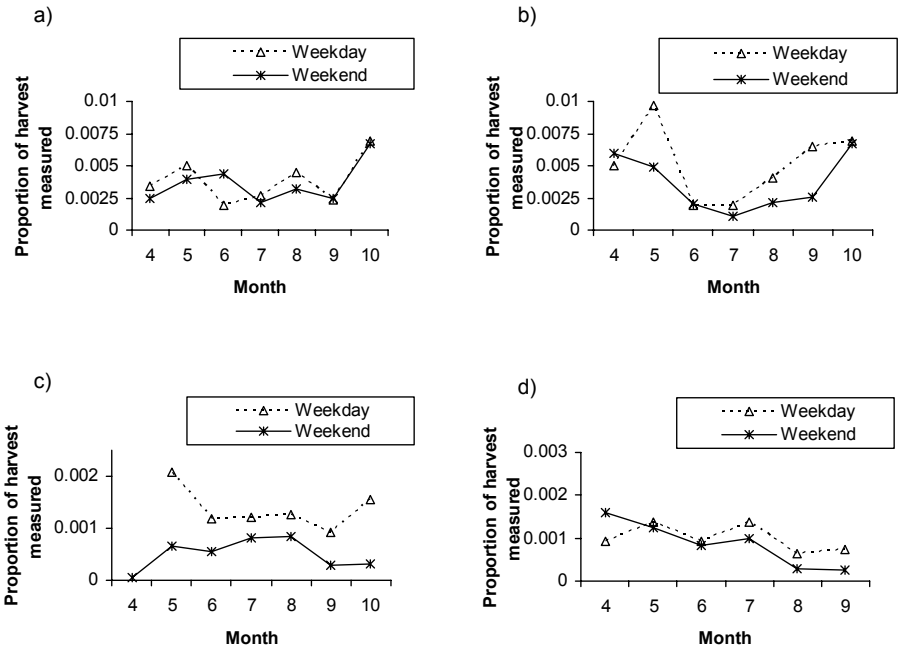

Figure 3. Proportion of harvest measured by weekday strata for walleye in Management Unit 1 (a) and Management Unit 2 (b) and yellow perch in Management Unit 1 (c) and Management Unit 2 (d), 2004.

For yellow perch, in 2004 harvest estimates were similar between weekday and weekend strata across all Districts. There was some indication that biological samples were collected at a proportionately higher rate from weekday samples, relative to weekend samples (Figure 3). Overall, approximately 0.15% of the monthly catch was sampled for biological information on weekday strata, while 0.1% of the monthly catch was sampled for biological information on weekend strata. For yellow perch, Spearman Rank correlation analyses of monthly estimates of harvest by management unit and weekday/weekend strata and monthly proportion of harvest sampled for biological information indicated that, in some cases, estimated yellow perch harvest by district and weekday/weekend strata in 2004 did show a weak negative correlation to proportion of the catch sampled. Correlation coefficients ranged from -0.96-0.43, but were only statistically significant ($p<0.05$) during weekdays in District 1 ($p=0.04$) and District 3 ($p=0.003$) (Figure 4).

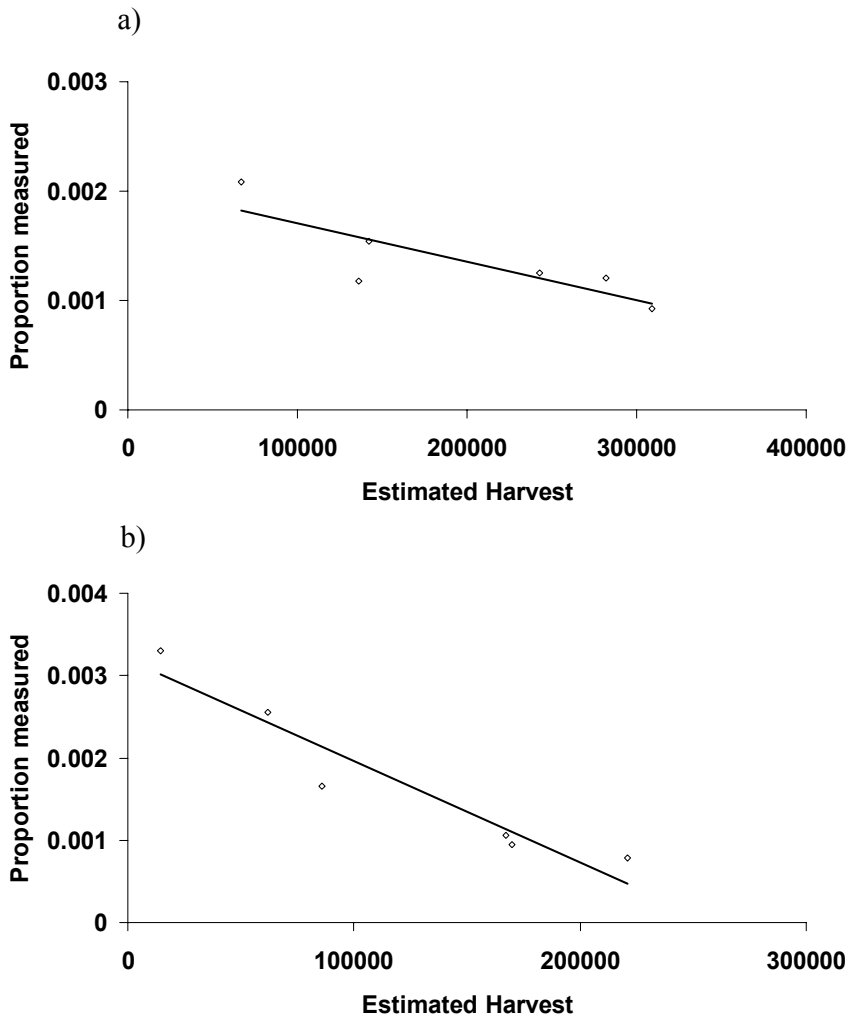

Figure 4. Scatter plot of estimated yellow perch harvest (numbers) versus proportion of harvest measured versus estimated harvest, 2004.

Based upon these above results, and the recommendations from the review panel, ODNR added a roving creel clerk to "dissociate" interviewing from biological sampling to avoid bias (Bernard et al. 1998) in 2005. As a result of this change, in 2005 correlations between proportion of the catch measured for biological information showed no significant relationships to the yellow perch estimated harvest by District and weekday strata. In addition, a significantly higher proportion of the harvest was characterized for biological information (0.1% in 2004 versus 0.5% in 2005). For walleye, proportion of the catch measured for biological information showed no relationship to estimated harvest in 2005, while a similar proportion of the catch was characterized (1.5%). For both yellow perch and walleye harvest characterization, bias associated with depensatory sampling prior to 2005 may have been minimal, however, the current changes to the survey design should help to further minimize this bias. In addition to the above change to the ODNR creel program, ODNR biologists have changed instructions for creel clerks

such that instead of measuring five fish per cooler, all fish in each cooler are measured when possible.

11. Test Assumptions of Surveys Periodically

The review panel recommended that direct testing or evaluation of assumptions should be provided and supported by either appropriate references to the literature, similar studies, and/or by conducting periodic separate surveys to test for or evaluate the validity of the assumptions (e.g.; an aerial-access survey conducted every few years to evaluate the coverage assumptions of an access-access survey, or frequency plots to validate assumptions relative to length of fishing day). Most agencies have conducted some form of independent validation of certain aspects of their creel survey programs. For example, PFBC periodically schedules a more complete, all access survey to update proportionality and addition of or substitution of access sample locations. When NYSDEC changed their creel survey program from an aerial-access to an access-access design, the data from aerial surveys were used to independently validate access effort estimation procedures (Einhouse 2005). Additionally, in both NYSDEC and MDNR surveys, municipal ramp trailer counts are used to independently verify trends in fishing effort. Between 1999 and 2003 NYSDEC found municipal ramp launch totals to validate creel survey estimates of angler effort through a period of transition in creel survey design, both launch totals and creel survey estimates of angler effort declined an identical 22% during this period (Table 6). In 2003-2004, ODNR initiated seasonal periodic aerial surveys of fishing effort in Ohio waters of the western basin of Lake Erie to provide an independent estimate of fishing effort. The ODNR aerial validation study will be provided as an addendum to this document.

Table 6. A comparison of annual paid boat launch totals from three major access sites with creel survey estimates of angler effort through a period of transition in creel survey design on New York's portion of Lake Erie.

Year	Number of Paid Boat Launches at selected New York Municipal Ramps				Creel Survey Fishing Effort for New York's portion of Lake Erie (May-Oct)	
	Small Boat Hbr	Sturgeon Point	Barcelona Hbr	Total	Survey method	Angler-hour estimate
1999	9,830	6,850	2,966	19,646	Aerial	455,317
2000	8,130	6,342	1,789	16,261	Aerial	424,563
2001	8,324	6,275	1,828	16,427	Aerial	438,653
2002	7,556	6,528	1,717	15,801	Access	341,860
2003	7,909	4,921	2,424	15,254	Access	353,128

Conclusions

The Lake Erie Committee agencies found the Harvest Assessment Review very beneficial, with several significant outcomes. First, the Harvest Assessment Review required the agencies to consolidate harvest assessment protocols internally. Many of the protocols were readily available, but not in a single, comprehensive document. This consolidation of the harvest assessment programs will be useful for the LEC and member agencies into the future for documentation. Additionally, as a result of the review, all agencies have converted to either otoliths or spines for age estimation of the percid harvest. Although under way for some agencies, the recommendations highlighted the need for every agency to examine procedures for age estimation.

The review also initiated changes in harvest accounting, particularly for annually or periodically measured subordinate fisheries that historically were not accounted for in the current quota management system, as well as an accounting for latent mortality. With most agencies recently implementing size-based regulations on recreational anglers, the estimates of release mortality for both yellow perch and walleye need to be re-evaluated for Lake Erie. At this time, the LEC is uncomfortable with making management recommendations because 1) most subordinate fishery harvest estimates are incompletely measured, and 2) a procedure for dealing with subordinate fishery harvest/latent mortality needs to be developed. In light of these concerns, the LEC has proposed to recommend these two issues research priorities for the next funding cycle.

The review was also useful in pointing out areas of potential bias in agency harvest estimation procedures, and the panel members were helpful in suggesting ways to address these biases. Lastly, the review highlighted the fact that agencies should be working in a coordinated fashion to estimate percid harvest. This likely will be very important into the future with potential fiscal shortfalls facing most agencies.

References

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