Report of the Lake Erie Yellow Perch Task Group

March 2025

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Introduction

From April 2024 through March 2025 the Yellow Perch Task Group (YPTG) addressed the following charges:

1. Maintain and update the centralized time series of datasets required for population models and assessment including:
    a. Fishery harvest, effort, age composition, biological and stock parameters.
    b. Survey indices of young-of-year, juvenile and adult abundance, size-at-age and biological parameters.
    c. Fishing harvest and effort by grid.

2. Report Recommended Allowable Harvest (RAH) levels for LEC TAC decisions.

3. Ensure population models are current and produce the most scientifically defensible and reliable method for estimating and forecasting abundance, recruitment, and mortality.
    a. Evaluate the impact of recruitment indices on ADMB model results.
    b. Evaluate ADMB model parameter sensitivity.

4. Supply needed technical support throughout the upcoming Yellow Perch Management Plan (YPMP) review process and support QFC with the transition of the Yellow Perch model from ADMB to TMB.

Charge 1: 2024 Fisheries Review and Population Dynamics

The lakewide total allowable catch (TAC) of Yellow Perch in 2024 was 6.554 million pounds. This allocation represented a less than 1% decrease from a TAC of 6.573 million pounds in 2023. For Yellow Perch assessment and allocation, Lake Erie is partitioned into four management units (MUs; Figure 1.1). In March 2024 the Lake Erie Committee (LEC) set TAC allocations of 2.861, 0.572, 2.654, and 0.467 million pounds for MUs 1 through 4, respectively. In 2024 the LEC applied the standard harvest policy within the Yellow Perch Management Plan to set the TAC for MUs 1, 3 and 4. For MU1, the 2024 TAC of 2.861 million pounds was an 18% increase from 2023. For MU3, the 2024 TAC of 2.654 million pounds was a 14% decrease from 2023. In MU4, the 2024 TAC was 20% lower than in 2023.

One component of the harvest control rules now in place is a probabilistic risk tolerance (P). As described further in Charge 2 (pages 8-9), this value represents the probability of the yellow perch population being below the limit reference point after fishing in 2025 at the target fishing mortality rate. In 2024, the P value in MU2 was 0.11, marking the first year that MU2 did not invoke the P* rule since the YPMP took effect in 2019. Following guidance from the YPMP and using assumed TACs (without P*) in previous years, the maximum 2024 RAH in MU2 was calculated at 2.748 million pounds. However, there was evidence of retrospective patterns in SCAA abundance estimates (see Charge 3). In addition, there were conflicting poor status indicators in MU2 and no indication of a large year class recruiting to the fishery. Therefore, a precautionary approach was taken in MU2, and the YPTG recommended holding the 2024 MU2 TAC near the 2023 levels. The YPMP permits the LEC to deviate from the harvest control rules in cases where there is compelling evidence to indicate the sustainability of the yellow perch population is at risk, or if there is strong social or economic rationale to do so. Given the multiple concerns in MU2, the LEC set the TAC at 0.572 million pounds, representing an 20% increase from 2023.

The lakewide harvest of Yellow Perch in 2024 was 3.500 million pounds, or 53% of the total 2024 TAC. This was a 19% decrease from the 2023 harvest of 4.305 million pounds. Harvest from MUs 1 through 4 was 2.057, 0.352, 0.798, and 0.293 million pounds, respectively (Table 1.1). The portion of TAC harvested was 72%, 62%, 30%, and 63%, in MUs 1 through 4, respectively. In 2024, Ontario harvested 2.255 million pounds, followed by Ohio (1.072 million lbs.), Michigan (0.072 million lbs.), Pennsylvania (0.058 million lbs.), and New York (0.043 million lbs.).

Ontario's fraction of allocation harvested was 102% in MU1, 95% in MU2, 42% in MU3, and 92% in MU4 (see paragraph below regarding Ontario's harvest reporting and commercial ice allowance policy). Ontario's TAC is allocated entirely to the commercial fishery. Ohio anglers and commercial fishers attained 56% of their TAC in the western basin (MU1), 34% in the west central basin (MU2), and 19% in the east central basin (MU3). There is no commercial fishery for Yellow Perch in Michigan. Michigan sport anglers in MU1 attained 28% of their TAC. Pennsylvania fisheries harvested 14% of their TAC in MU3 (trap net and sport anglers) and 4% of their TAC in MU4 (angling only). New York fisheries attained 30% of their TAC in MU4 through a trap net fishery and angling. Ontario's portion of the lakewide Yellow Perch harvest in 2024 was 64% (Table 1.1). Ohio's proportion of lakewide harvest was 31%, and harvest in Michigan, Pennsylvania, and New York waters combined represented around 5% of the lakewide harvest in 2024.

Ontario continued to employ a commercial ice allowance policy implemented in 2002, by which 3.3% is subtracted from commercial landed weight. This step was taken so that ice needed to maintain fish quality was not debited towards fishers' quotas. For consistency throughout the time series, Ontario's landed weights in the YPTG report have not been adjusted to account for ice content. Ontario's reported Yellow Perch harvest in tables and figures is represented exclusively by the commercial gill net fishery. Yellow Perch sport harvest from

Ontario waters is assessed periodically. In 2024, Ontario completed a lakewide access point creel survey, which was the first creel survey since 2014. Harvest weights from this survey are reported at the bottom of tables 1.2 to 1.5. Reported sport harvests for Michigan, Ohio, Pennsylvania, and New York are based on annual creel survey estimates. Ohio, Pennsylvania, and New York trap net harvest and effort are based on commercial catch reports of landed fish. Additional fishery documentation is available in annual agency reports.

Harvest, fishing effort, and fishery harvest rates are summarized from 2015 to 2024 by management unit, year, agency, and gear type in Tables 1.2 to 1.5. Trends across a longer time series (1975 to 2024) are depicted graphically for harvest (Figure 1.2), fishing effort (Figure 1.3), and harvest rates (Figure 1.4) by management unit and gear type. The spatial distributions of harvest (all gears) and effort by gear type for 2024 in ten-minute interagency grids are presented in Figures 1.5 through 1.8.

Ontario's Yellow Perch harvest from large mesh (3 inches or greater stretched mesh) gill nets in 2024 was 2%, 14%, 3%, and <1% of the gill net harvest in management units 1 - 4, respectively. Harvest, effort, and catch per unit effort from (1) small mesh Yellow Perch effort (2.25" ≤stretched mesh< 3") and (2) larger mesh sizes, are distinguished in Tables 1.2 to 1.5. Relative to 2023, harvest from targeted small mesh gill nets in 2024 increased by 16% in MU1 and 12% in MU2 but declined 40% in MU3 and 26% in MU4. Ontario trap nets, which primarily target white bass, harvested zero yellow perch in 2024. Ontario commercial Rainbow Smelt trawlers incidentally caught Yellow Perch in management units 3 and 4, and this harvest is included in Tables 1.4 and 1.5. In 2024, 80 pounds of Yellow Perch were harvested in trawl nets in MU3 and 40 pounds were harvested in MU4.

Targeted (i.e., small mesh) gill net effort in 2024 was effectively unchanged in MU2 and decreased from 2023 effort by 9% in MU1, 33% in MU3 and 5% in MU4. Targeted gill net harvest rates in 2024 increased by 28% and 12% relative to 2023 rates in MU1 and MU2 respectively, while decreasing in MU3 by 12% and by 22% in MU4 (Figure 1.4).

Total US sport harvest in MU1 for 2024 was 438,955 lbs., a 54% decline compared to 2023. US sport harvest in 2024 also declined in MU4 by 40% to 33,657 lbs. Sport harvest in U.S. waters of MU2 during 2024 increased by 139% with a total of 27,227 lbs. MU3 also saw an increase in sport harvest (9,689 lbs.), a jump of 94% from 2023 (Figure 1.2). Angling effort in U.S. waters during 2024 was highest in MU1 (584,826 hours) and lowest in MU3 (11,622 hours). Angler effort decreased by 43% during 2024 compared to 2023 in both MU1 and MU4 (Figure 1.3). Although MU2 and MU3 sport harvest and effort increased in 2024, these values remained low compared to historic values and are based on very low sample numbers. In MU2, 2024 angler effort was 32,063 hours, an eight-fold increase compared to the 4,011 hours recorded in 2023, which was the second lowest on record. In 2023, angling effort in U.S. waters of MU3 at 4,780 hours was at its lowest in the time series. During 2024, angler effort in MU3 was 11,622 hours, an increase of 143%, but still the fifth lowest value in the time series.

Sport fishing harvest rates are commonly expressed as fish harvested per angler hour for those seeking Yellow Perch. These harvest rates are presented in Tables 1.2 to 1.5. Compared to 2023 rates, harvest per angler hour in 2024 decreased in Michigan (-32%) and Ohio (-19%) waters of MU1. In the central basin, the sport angler harvest rate increased in the Ohio waters of MU2 (+17%) although the rate of 0.8 fish/hour is still one of the lowest in the time series. In MU3, the 2024 Pennsylvania sport harvest rate increased (+900%) from the lowest catch rate in the time series observed in 2023, however this catch rate remains low. In Ohio waters of MU3, sport harvest rate decreased (-69%) to the second lowest value observed in the time series. Sport harvest rates in both MU2 and MU3 should be interpreted with caution as values are based on small sample sizes and continue to reflect low sport effort in the central basin. In MU4, New York waters harvest rate was 2.6 fish/hour, which was a small increase (+2%) compared to 2023. Harvest rate was only 0.6 fish/hour in Pennsylvania waters, which was a decline of 55% from the 2023 rate.

In 2024, Ontario completed a lakewide access point creel survey. Overall, the Ontario yellow perch harvest and catch rate were low compared to previous creel surveys. Estimated sport harvest in Ontario waters during 2024 was 1,263 lbs., 827 lbs., 1,210 lbs. and 9,977 lbs in MUs 1-4, respectively (Tables 1.2-1.5). In total, only 13,278 pounds of Yellow Perch was harvested by anglers in Ontario in 2024, with 75% of this harvest occurring in MU4 (including inner Long Point Bay). This was a switch from the last survey in 2014 when MU3 accounted for 74% of the estimated total 180,350 lbs. of Yellow Perch harvested by sport anglers in Ontario waters. As with other jurisdictions, Ontario has seen a decline in sport effort and harvest from their last estimates in 2014, in this case on an order of magnitude lakewide.

Trap net harvest increased by 5% in MU1 and 20% in MU2, while decreasing by 23% in MU3 and 16% in MU4 compared to 2023 (Tables 1.2 to 1.5). Trap net effort (lifts) in 2024 decreased in MU2, MU3, and MU4 by 1%, 10%, and 20% respectively, relative to 2023 trap net effort, while increasing 7% in MU1. Total trap net effort during 2024 was highest in MU1 at 7,169 lifts. Trap net effort in MU2 during 2024 (285 lifts) was 3rd lowest in the 1981-2024 time series reflecting the reduced 2024 TAC in MU2. Trap net harvest rates increased from 2023 rates by 22% and 5% in MU2 and MU4, respectively while decreasing 2% in MU1 and 14% in MU3. The trap net harvest rate in MU2 increased to 124 kg/lift in 2024, which was the highest value observed since 2018, however all MU2 trap net harvest was completed in May.

Age Composition and Growth

Lakewide, age-3 fish (2021 year class) contributed the most to the Yellow Perch harvest (61%), followed by age-2 fish (2022 year class; 16%), with age-4, age-5, and age-6-and-older fish contributing 14%, 7%, and 2%, respectively (Table 1.6). In MU1, age-3 fish contributed 71% to the fishery, followed by age-2 fish (19%) and age-4 (2020 year class, 7%). In MU2, age-3 fish also dominated the fishery with (67% of harvest, followed by age-4 fish (13%) and age-2 fish (12%) as the next biggest contributors to the fishery. In MU3, age-3 fish accounted for the largest proportion of harvest (39%), but at a smaller percentage than in MUs 1 and 2. MU3 also had large proportions of harvest by age-4 fish (29%) and age-5 fish (20%). While the harvest in MU1-3 was dominated by age-3 fish, in MU4 both age-3 and age-4 contributed 34% each to the fishery, followed by age-2 fish (17%).

The task group continues to update Yellow Perch growth data in: (1) weight-at-age values recorded annually in the harvest and (2) length- and weight-at-age values taken from interagency trawl and gill net surveys. These values are applied in the calculation of population biomass and the forecasting of harvest in the approaching year. Therefore, changes in weight-at-age factor into the changes in overall population biomass projections and determination of recommended allowable harvest (RAH).

Statistical Catch-at-Age Analysis

Population size for each management unit was estimated by statistical catch-at-age analysis (SCAA) using the Auto Differentiation Model Builder (ADMB) computer program (Fournier et al. 2012). In 2025, the YPTG continued to use the ADMB model developed by the Quantitative Fisheries Center (QFC) at Michigan State University (referred to as the Peterson-Reilly or PR model) as part of the Lake Erie Percid Management Advisory Group (LEPMAG) review of Yellow Perch management on Lake Erie.

The PR model uses harvest and effort data from commercial gill net, commercial trap net, and recreational fisheries within each MU. Survey catch-at-age of age-2 and older fish from gill net and bottom trawl surveys are also incorporated. In addition, age-0 and age-1 recruitment data are incorporated into the model as a recruitment index. The PR model estimates selectivity for all ages in the fisheries and surveys. There is a commercial gill net selectivity block beginning in 1998. Catchabilities for all fisheries and surveys vary annually as a correlated 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 (i.e., does not change by more than 1-2 units). Second, age-2 abundance estimates from the first model are combined with age-0 and age-1 recruitment data (from trawl and gill net assessment surveys) in a multi-model inference (MMI) R-based model to determine parameters for estimating recruitment. Recruitment data from the last nine years are removed from the model to minimize possible retrospective effects. Further, years with missing data in one or more data sets are removed from all data sets. Surveys missing data for the projection year (e.g., 2020 year class in the 2022 TAC year) are also removed from the analysis. A list of all possible non-redundant models is generated from the survey data and fit using the R-based *glmulti* package (Calcagno 2013). All models falling within 2 AIC units of the best model are used to generate the model-averaged coefficients. Surveys are not weighted equally in the final model-averaged coefficients; each model may contain a different set of surveys and the models with lower AIC values are weighted more heavily and have greater influence on the recruitment predictions. Parameter estimates for the model-averaged coefficients for each MU are detailed in Appendix Table 2. A recruitment index is generated to estimate age-2 fish for each year class available in the recruitment data, using the age-0 and age-1 survey data. This process is repeated using just age-0 data, which is only used to estimate recruitment in two years' time. Data from trawl and gill net index recruitment series for the time period examined are presented in Appendix Table 3, and a key that summarizes abbreviations used for the trawl and gill net series is presented in Appendix Table 4.

In the third step, the recruitment index is added to the ADMB model, and this data set is used to inform age-2 abundance estimates within the objective function. This model is then run iteratively until the maximum effective sample size for the multinomial age composition stabilizes. Estimates of population size, from 2006 to 2024, and projections for 2025, are presented in Table 1.7. Abundance, biomass, survival, and exploitation rates are presented by management unit graphically for 1975 to 2024 in Figures 1.9 to 1.12. Mean weights-at-age from assessment surveys were applied to abundance estimates to generate population biomass estimates (Figure 1.10). Projections of abundance and biomass in 2025 are included in Figures 1.9 and 1.10.

Population abundance and biomass estimates are critical to monitoring the status of stocks and determining recommended allowable harvest.

Abundance estimates should be interpreted with several caveats. Inclusion of abundance estimates from 1975 to 2024 implies that the time series are continuous. Lack of data continuity for the entire time series weakens the validity of this assumption. Survey data from multiple agencies are represented only in the latter part of the time series (since the late 1980s); methods of fishery data collection have also varied. Some model parameters, such as natural mortality, are constrained to constants both through time and among ages. This technique lessens our ability to directly compare abundance levels across four decades. In addition, the most recent year's population estimates from an SCAA model inherently have the widest error bounds, which is to be expected for cohorts that remain at-large under less than full selectivity in the population.

In the SCAA model, population estimates are derived by minimizing an objective function weighted by data sources, including fishery effort, fishery catch, and survey catch rates. In 2011-2012, the YPTG group determined data weightings (referred to as lambdas in ADMB) using an expert opinion approach for evaluating potential sources of bias in data sets that could negatively influence model performance (YPTG 2012). These data weightings were used during 2025 and are presented in Appendix Table 1. The additional recruitment index (generated from the glmulti process) was given a lambda weighting of 1 during the LEPMAG process.

2025 Population Size Projection

The SCAA model was used to project age-2-and-older Yellow Perch stock size in 2025 (Table 1.7). Standard errors and ranges for 2025 projections are provided for each age, and descriptions of minimum, mean, and maximum population estimates refer to the age-specific mean estimates minus or plus one standard deviation (Table 2.2).

Stock size estimates for 2024 (Table 1.7) were lower than those projected last year in MU1 and MU3 and varied slightly from previous projections in MU2 and MU4 (YPTG 2024). Decreases in MU1 and MU3 were due to lower estimates of age-3 fish compared to those projected last year. The lakewide projection of age-2 and older fish using 2023 data was 168.673 million age-2 and-older Yellow Perch in 2024 (YPTG 2024), while estimates using 2024 data in the 2025 model run estimated 2024 abundance of age-2 and-older Yellow Perch at 149.142 million fish. Lakewide abundance of age-2-and-older Yellow Perch is projected to be 155.446 million fish in 2025, an increase of 4% from 2024 estimates.

Abundance projections for 2025 are 39.926, 42.303, 66.633, and 6.584 million age-2-and-older Yellow Perch in management units 1 through 4, respectively. Abundance of age-2-and-older Yellow Perch in 2025 are projected to decrease 12%, 8%, and 19% in MU1, MU2, and MU4 respectively, relative to the 2024 abundance estimates (Table 1.7, Figure 1.9). Abundance of age-2-and-older Yellow Perch in 2025 is projected to increase by 35% in Unit 3, primarily driven by a projected increase in age-2 fish.

Projected age-2 Yellow Perch recruitment in 2025 (2023 year class) was 19.614, 12.780, 36.153, and 2.079 million fish in MU 1 through 4, respectively (Table 1.7.). Age-3-and-older Yellow Perch abundance in 2025 is projected to be 20.312, 29.523, 30.480, and 4.505 million fish in MUs 1 through 4, respectively. Abundance estimates for age-3-and-older Yellow Perch in 2025 are projected to increase from the 2024 estimates only in MU3 (10%). These estimates decreased in all other units, with the biggest decline of 20% in MU1. These decreases are largely due to lower estimates of age-2 fish in 2024, which are projected forward to age-3 fish in 2025.

As a function of population abundance and mean weight-at-age from fishery-independent surveys, total biomass of age-2-and-older Yellow Perch for 2025 are projected to decrease in MUs 1, 2 and 4 by 18%, 6%, and 2%, respectively, compared to 2024 estimates while increasing by 15% in MU3 (Figure 1.10).

Estimates of Yellow Perch survival for age-3-and-older in 2024 were 34%, 63%, 58%, and 49% in MUs 1 through 4, respectively (Figure 1.11). Estimates of Yellow Perch survival in 2024 for age-2-and-older fish were 45%, 64%, 62%, and 55% in MUs 1 through 4, respectively. Estimated exploitation rates of ages-3-and-older Yellow Perch in 2024 were 41%, 5%, 11%, and 23% in management units 1 through 4, respectively. Estimates of Yellow Perch exploitation for ages-2-and-older fish in 2024 were 28% in MU1, 3% in MU2, 7% in MU3, and 15% in MU4 (Figure 1.12). Exploitation rate for ages-2-and-older fish in MU2 during 2021-2024 were the lowest in the 50-year time series.

Charge 2: Harvest Strategy and Recommended Allowable Harvest (RAH)

In 2025 the YPTG applied the harvest control rules finalized by the LEC and LEPMAG in 2020. The harvest control rules are comprised of:

- Target fishing mortality as a percent of the instantaneous fishing mortality at maximum sustainable yield (F_{msy})
- Limit reference point of the biomass at maximum sustainable yield (B_{msy})

- Probabilistic risk tolerance, P-star, P*=0.20
- A limit on the annual change in TAC of ± 20% (when $P(SSB \leq B_{msy}) \leq P^*$); see Yellow Perch Management Plan, Lake Erie Committee, 2020.

Target fishing rates and limit reference points are estimated annually using SCAA model results. Estimating reference points and recommended allowable harvest is a three-step process. First, estimated recruitment and spawning stock biomass from the SCAA model, along with maturity, weight, and average selectivity at age, are entered into an ADMB model that: 1) estimates the parameters of a Ricker stock-recruitment model and 2) calculates the theoretical spawning stock biomass without fishing (SSB_0). The stock-recruitment relationships for MUs 1, 2, and 3, are estimated using a hierarchical framework, while MU4 is fit independently. In the second step, maturity, weight, and average selectivity at age, along with the parameters of the stock-recruitment relationship are entered in an R-based model. This model estimates F_{msy} and B_{msy} for the harvest control rule. Finally, F_{msy}, F_{target} (as a percent of F_{msy}), and B_{msy} (as a percent of SSB_0), are entered into the SCAA model to estimate RAH in each management unit. If the model estimates that fishing at F_{target} meets or exceeds a 0.20 probability (P*) that the projected spawning stock biomass will be less than the limit reference point (B_{msy}), then the fishing rate is reduced until the probability is less than 0.20. Values of SSB_0, B_{msy}, F_{msy}, and F_{target} for each management unit can be found in Table 2.1. Target fishing rates are applied to population estimates and their standard errors to determine minimum, mean, and maximum RAH values for each management unit (Tables 2.2 and 2.3). In addition, RAH values may be subject to a ±20% limit on the annual change in TAC when $P(SSB \leq Bmsy) < 0.20$ (i.e., when P* is not invoked).

With the addition of 2024 data, the limit reference point estimate, B_{msy} increased from 2.193 million kg to 2.817 million kg in MU1 while the target fishing rate, F_{target} decreased from 0.431 to 0.277. In MU2, B_{msy} increased slightly from 3.988 million kg to 4.200 million kg and F_{target} decreased from 0.620 to 0.553. In MU3, B_{msy} increased slightly from to 3.705 million kg to 3.872 million kg and F_{target} decreased to 0.522 from 0.576. In MU4, B_{msy} increased from to 0.462 million kg to 0.512 million kg and F_{target} decreased slightly from to 0.544 to 0.534 (Table 2.1).

The Yellow Perch Management Plan (YPMP) includes a provision on how to estimate RAH in a TAC year where P* is not invoked, but P* has persisted for multiple years prior. In this case the LEC will determine what the TAC would have been using the target F and the 20% TAC constraint for each of the years during that period, thus establishing what can be considered an "assumed TAC". The previous years assumed TAC can then be used as a benchmark for the implementation of the 20% TAC constraint and a new TAC moving forward (LEC, 2020). In 2025, the P value in MU2 is 0.11, marking the second year that MU2 has not invoked the P* rule since the YPMP took effect in 2019. Following the above guidance from the YPMP using previous "assumed TAC", the minimum RAH in MU2 would be 2.198 million pounds and the maximum 2025 RAH would be 3.297 million pounds. However, there is strong evidence of retrospective patterns in SCAA abundance estimates and the model fails to meet convergence criteria (see Charge 3). Also, most fishery and survey catch rates were poor to moderate, and there is no indication of a large year class recruiting to the fishery in 2025. Further, 67% of the 2024 harvest came from one year class (2021, age 3) and this one age class will continue to be the main fishable biomass in 2025. Therefore, a precautionary approach is again warranted in MU2, and the YPTG recommends holding the 2025 MU2 TAC near the 2024 level (0.572 million pounds). The YPMP permits the LEC to deviate from the harvest control rules in cases where there is compelling evidence to indicate the sustainability of the yellow perch population is at risk, or if there is strong social or economic rationale to do so. If the LEC chooses to deviate from the harvest control rules, clear and transparent justification will be provided to stakeholders (LEC, 2020).

YPTG also has concerns about the application of the harvest control rule in MU1. In MU1, the 2024 assessment survey and fishery catch rates were poor to moderate compared to the time series. In addition, fishable biomass is estimated to decline in 2025 and will be dominated by one year class (2021, age 4). As with other units, the models in MU1 continue to have convergence issues, but the retrospective error for abundance estimates is highest in MU1 and the first-year model run overestimates age 2 and older fish by an average of 38%. Taken together, the YPTG feels these concerns warrant a conservative approach in MU1 and thus recommends a value between the mean and maximum RAH (Table 2.3), which would be a reduction of more than 20% from the previous years TAC and a deviation from the harvest control rule.

In MU3, the YPTG recommends a TAC of the minimum RAH based on similar modeling issues to other units (Retrospective patterns and poor model convergence), poor and declining 2024 sport fishery catch rates, poor survey catch rates, and indications that recent fishing rates may be high based on other systems. There is potential recruitment in 2025, however age-2 fish in MU3 have low selectivity and they will not contribute much to the fishery. While there are modeling concerns with MU4 as well, fishery and survey catch rates in 2024 were moderate to good for the time series and the YPTG recommends a TAC at the mean RAH in Table 2.3 for this unit.

Quota allocation by management unit and jurisdiction for 2025 was determined by the same methods applied in 2009-2024, using GIS applications of jurisdictional surface area of waters within each MU (Figure 2.1). The allocation of shares by management unit and jurisdiction are:

Allocation of TAC within Management Unit and Jurisdiction, 2025:

MU1:	ONT	40.6%	OH	50.3%	MI	9.1%
MU2:	ONT	45.6%	OH	54.4%		
MU3:	ONT	52.3%	OH	32.4%	PA	15.3%
MU4:	ONT	58.0%	NY	31.0%	PA	11.0%

Charge 3: Utilize existing population models to produce the most scientifically defensible and reliable method for estimating and forecasting abundance, recruitment, and mortality.

The YPTG has been using the current configuration of the SCAA ADMB model since 2019. It has been found that abundance estimates in the last year of the model often decrease between the first estimate in the model and subsequent years estimates in the model. On average age-2 estimates for the various MUs decrease between 9% and 38% from the first time they are estimated by the model to the second time they are estimated by the model. Further, age-2 estimates decrease an average of 28% to 59% between the first time they are estimated by the model to the third time they are estimated by the model, with the lowest change occurring in MU4 and the highest in MU1. This means that abundance estimates used to calculate RAH ranges in each MU are likely biased high, which could lead to harvesting more Yellow Perch than intended. In this year's model run the age-2 abundance values in 2024 are the first model estimates of this year class. The 2024 age-2 estimates are projected forward to age-3 abundance in 2025 using survival estimates. This leads to a potential overestimate of age-3 fish in 2025, which is used in RAH calculations. Reasons for this retrospective pattern are unknown. YPTG is consulting with QFC, which is conducting additional work to evaluate these retrospective patterns in model results and their causes.

Charge 4. Supply needed technical support throughout the upcoming YPMP review process

The Yellow Perch Management Plan (YPMP) was intended to run from 2020 to 2024. The YPMP states that the Yellow Perch Task Group (YPTG) will be responsible for preparing a status report evaluating the YPMP. During 2024 the YPTG drafted a review of the YPMP that included an evaluation of fishery performance metrics, plan performance, and performance of the statistical catch-at-age (SCAA) models. In addition, the YPTG met with LEC, Standing Technical Committee (STC) and Michigan State University's Quantitative Fisheries Center (QFC) to discuss data utilized in the SCAA model. QFC continues to evaluate the model data sets and has begun implementing the statistical catch-at-age models using Template Model Builder (TMB) to address some concerns relating to the ADMB model. The YPTG continues to provide support to QFC as they work on this process. Converting the statistical catch-at-age models to TMB will be incorporated into the YPMP review, which may take up to two years.

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Table 1.1. Lake Erie Yellow Perch harvest in pounds by management unit (Unit) and agency, 2015-2024

		Ontario*		Ohio		Michigan		Pennsylvania		New York		Total
	Year	Harvest	%	Harvest	%	Harvest	%	Harvest	%	Harvest	%	**Harvest**
Unit 1	2015	541,938	48	485,744	43	94,225	8	--	--	--	--	1,121,907
	2016	947,052	42	886,068	40	397,044	18	--	--	--	--	2,230,164
	2017	1,277,587	46	1,239,575	45	255,605	9	--	--	--	--	2,772,767
	2018	1,262,229	54	956,016	41	107,789	5	--	--	--	--	2,326,034
	2019	847,476	69	357,533	29	15,745	1	--	--	--	--	1,220,754
	2020	857,561	64	391,231	29	84,613	6	--	--	--	--	1,333,405
	2021	959,259	58	625,787	38	69,575	4	--	--	--	--	1,654,621
	2022	770,476	51	658,935	44	67,667	5	--	--	--	--	1,497,078
	2023	1,016,545	43	1,254,927	53	104,388	4	--	--	--	--	2,375,860
	2024	1,181,781	57	803,016	39	71,968	3	--	--	--	--	2,056,765
Unit 2	2015	1,489,433	57	1,131,993	43	--	--	--	--	--	--	2,621,426
	2016	1,283,379	62	792,869	38	--	--	--	--	--	--	2,076,248
	2017	1,498,437	70	643,554	30	--	--	--	--	--	--	2,141,991
	2018	1,271,365	69	559,122	31	--	--	--	--	--	--	1,830,487
	2019	740,490	63	433,477	37	--	--	--	--	--	--	1,173,967
	2020	407,553	60	268,213	40	--	--	--	--	--	--	675,766
	2021	205,377	63	121,200	37	--	--	--	--	--	--	326,577
	2022	177,919	60	117,860	40	--	--	--	--	--	--	295,779
	2023	210,716	73	76,269	27	--	--	--	--	--	--	286,985
	2024	247,363	70	105,015	30	--	--	--	--	--	--	352,378
Unit 3	2015	2,131,211	77	572,736	21	--	--	77,558	3	--	--	2,781,505
	2016	2,020,470	76	522,549	20	--	--	107,972	4	--	--	2,650,991
	2017	2,027,235	77	504,223	19	--	--	107,335	4	--	--	2,638,793
	2018	1,807,645	78	460,797	20	--	--	54,085	2	--	--	2,322,527
	2019	1,328,966	79	320,756	19	--	--	38,953	2	--	--	1,688,675
	2020	478,837	71	175,550	26	--	--	18,022	3	--	--	672,408
	2021	704,636	75	220,127	23	--	--	18,938	2	--	--	943,701
	2022	932,682	77	211,444	18	--	--	63,872	5	--	--	1,207,998
	2023	959,420	78	222,369	18	--	--	54,538	4	--	--	1,236,327
	2024	578,286	72	163,785	21	--	--	55,585	7	--	--	797,656
Unit 4	2015	297,716	77	--	--	--	--	10,055	3	76,597	20	384,368
	2016	231,063	87	--	--	--	--	6,791	3	28,078	11	265,932
	2017	179,730	76	--	--	--	--	16,078	7	39,598	17	235,407
	2018	272,733	90	--	--	--	--	1,452	0	29,159	10	303,344
	2019	326,179	85	--	--	--	--	1,485	0	56,219	15	383,883
	2020	384,737	91	--	--	--	--	2,664	1	36,083	9	423,484
	2021	311,866	84	--	--	--	--	1,677	0	57,567	16	371,110
	2022	314,039	79	--	--	--	--	533	0	84,399	21	398,971
	2023	336,237	83	--	--	--	--	1,035	0	68,691	17	405,963
	2024	247,988	85	--	--	--	--	1,948	1	43,395	15	293,331
Lakewide	2015	4,460,298	65	2,190,473	32	94,225	1	87,613	1	76,597	1	6,909,206
Totals	2016	4,481,964	62	2,201,486	30	397,044	5	114,763	2	28,078	0	7,223,335
	2017	4,982,989	64	2,387,352	31	255,605	3	123,413	2	39,598	1	7,788,958
	2018	4,613,972	68	1,975,935	29	107,789	2	55,537	1	29,159	0	6,782,393
	2019	3,243,111	73	1,111,766	25	15,745	0	40,437	1	56,219	1	4,467,278
	2020	2,128,688	69	834,994	27	84,613	3	20,685	1	36,083	1	3,105,063
	2021	2,181,138	66	967,114	29	69,575	2	20,615	1	57,567	2	3,296,009
	2022	2,195,116	65	988,239	29	67,667	2	64,405	2	84,399	2	3,399,826
	2023	2,522,918	59	1,553,565	36	104,388	2	55,573	1	68,691	2	4,305,135
	2024	2,255,418	64	1,071,816	31	71,968	2	57,533	2	43,395	1	3,500,130

*processor weight (quota debit weight) to 2001; fisher/observer weight from 2002 to 2024 (negating ice allowance).

Table 1.2. Harvest, effort and harvest per unit effort summaries for Lake Erie Yellow Perch fisheries in Management Unit 1 (Western Basin) by agency and gear type, 2015-2024.

		Unit 1					
		Michigan	Ohio		Ontario Gill Nets		Ontario
	Year	Sport	Trap Nets	Sport	Small Mesh	Large Mesh*	Trap Nets
Harvest	2015	94,225	0	485,744	533,167	8,712	59
(pounds)	2016	397,044	103,345	782,723	938,558	8,445	49
	2017	255,605	447,263	792,312	1,271,282	5,466	839
	2018	107,789	439,720	516,296	1,248,042	14,031	156
	2019	15,745	193,243	164,290	818,773	28,670	33
	2020	84,613	136,555	254,676	853,096	4,463	2
	2021	69,575	182,521	443,266	939,063	20,179	17
	2022	67,667	188,739	470,196	756,770	13,706	0
	2023	104,388	414,728	840,199	1,001,296	15,249	0
	2024	71,968	436,029	366,987	1,162,819	18,962	0
Harvest	2015	43	0	220	242	4	0.03
(Metric)	2016	180	47	355	426	4	0.02
(tonnes)	2017	116	203	359	577	2	0.38
	2018	49	199	234	566	6	0.07
	2019	7	88	75	371	13	0.01
	2020	38	62	115	387	2	0.00
	2021	32	83	201	426	9	0.01
	2022	31	86	213	343	6	0.00
	2023	47	188	381	454	7	0.00
	2024	33	198	166	527	9	0.00
Effort	2015	137,246	0	659,460	4,074	508	--
(a)	2016	251,426	2,446	824,418	6,091	431	--
	2017	204,877	3,830	775,334	5,656	600	--
	2018	137,930	3,500	500,695	5,143	667	--
	2019	57,929	3,811	284,068	6,363	714	--
	2020	151,528	3,341	500,595	9,183	393	--
	2021	113,935	3,741	628,491	10,489	1,124	--
	2022	115,916	4,943	621,067	8,588	1,354	--
	2023	97,889	6,696	923,523	7,212	1,020	--
	2024	91,154	7,169	493,672	6,542	898	--
Harvest Rates	2015	2.7	--	3.1	59.4	7.8	--
(b)	2016	4.8	19.2	4.1	69.9	8.9	--
	2017	4.3	53.0	3.4	101.9	4.1	--
	2018	2.3	57.0	2.9	110.1	9.5	--
	2019	0.8	23.0	1.7	58.4	18.2	--
	2020	1.8	18.5	1.6	42.1	5.2	--
	2021	1.7	22.1	2.0	40.6	8.1	--
	2022	1.5	17.3	2.1	40.0	4.6	--
	2023	3.0	28.1	2.9	63.0	6.8	--
	2024	2.0	27.6	2.4	80.6	9.6	--

(a) sport effort in angler-hours; gill net effort in km; trap net effort in lifts
(b) harvest rates for sport in fish/hr, gill net in kg/km, trap net in kg/lift
(c) the Ontario sport fishery harvested approximately 1,263 lbs of yellow perch in the 2024 creel survey
(*) large mesh catch rates are not targeted and are therefore of limited value.

Table 1.3. Harvest, effort and harvest per unit effort summaries for Lake Erie Yellow Perch fisheries in Management Unit 2 (western Central Basin) by agency and gear type, 2015-2024.

		Unit 2				
		Ohio		Ontario Gill Nets		Ontario
	Year	Trap Nets	Sport	Small Mesh	Large Mesh*	Trawls
Harvest	2015	1,005,061	126,932	1,471,107	18,268	58
(pounds)	2016	688,033	104,836	1,248,729	34,631	19
	2017	590,447	53,107	1,435,508	62,872	57
	2018	528,234	30,888	1,204,621	66,744	0
	2019	419,631	13,846	569,850	170,640	0
	2020	248,721	19,492	376,946	30,604	3
	2021	116,109	5,091	151,859	53,518	0
	2022	97,659	20,201	152,490	25,429	0
	2023	64,854	11,415	189,619	21,097	0
	2024	77,788	27,227	212,367	34,996	0
Harvest	2015	456	58	667	8	0.0
(Metric)	2016	312	48	566	16	0.0
(tonnes)	2017	268	24	651	29	0.0
	2018	240	14	546	30	0.0
	2019	190	6	258	77	0.0
	2020	113	9	171	14	0.0
	2021	53	2	69	24	0.0
	2022	44	9	69	12	0.0
	2023	29	5	86	10	0.0
	2024	35	12	96	16	0.0
Effort	2015	6,309	217,637	9,459	1,207	--
(a)	2016	4,510	204,745	6,424	1,934	--
	2017	2,567	119,163	6,094	1,946	--
	2018	1,551	45,683	5,964	2,155	--
	2019	2,192	24,826	4,431	4,050	--
	2020	2,177	27,006	4,294	1,920	--
	2021	839	1,898	1,951	2,999	--
	2022	1,571	26,634	1,479	1,881	--
	2023	289	4,011	1,593	1,756	--
	2024	285	32,063	1,591	1,949	--
Harvest Rates	2015	72.2	1.5	70.5	6.9	--
(b)	2016	69.2	1.2	88.2	8.1	--
	2017	104.3	0.8	106.8	14.7	--
	2018	154.5	0.8	91.6	14.0	--
	2019	86.8	0.4	58.3	19.1	--
	2020	51.8	1.1	39.8	7.2	--
	2021	62.8	0.1	35.3	8.1	--
	2022	28.2	0.5	46.8	6.1	--
	2023	101.8	0.7	54.0	5.4	--
	2024	123.8	0.8	60.5	8.1	--

(a) sport effort in angler-hours; gill net effort in km; trap net effort in lifts
(b) harvest rates for sport in fish/hr, gill net in kg/km, trap net in kg/lift
(c) the Ontario sport fishery harvested approximately 827 lbs of yellow perch in the 2024 creel survey
(*) large mesh catch rates are not targeted and therefore of limited value

Table 1.4. Harvest, effort and harvest per unit effort summaries for Lake Erie Yellow Perch fisheries in Management Unit 3 (eastern Central Basin) by agency an5 gear type, 2015-2024.

		Unit 3						
		Ohio		Pennsylvania		Ontario Gill Nets		Ontario
	Year	Trap Nets	Sport	Trap Nets	Sport	Small Mesh	Large Mesh*	Trawls
Harvest	2015	266,030	306,706	6,854	70,704	2,084,595	43,072	3,544
(pounds)	2016	349,844	172,705	51,148	56,824	2,003,842	16,459	169
	2017	449,979	54,244	45,741	61,594	1,964,728	61,127	1,380
	2018	439,233	21,564	51,093	2,992	1,743,484	63,902	259
	2019	318,089	2,667	34,323	4,630	1,261,586	67,230	150
	2020	171,180	4,370	14,961	3,061	403,720	75,102	15
	2021	206,384	13,743	17,303	1,635	622,917	81,711	8
	2022	207,890	3,554	60,665	3,207	904,990	27,671	21
	2023	218,689	3,680	53,209	1,329	942,641	16,768	11
	2024	156,864	6,921	52,808	2,777	561,122	17,084	80
Harvest	2015	121	139	3.1	32	945	20	1.6
(Metric)	2016	159	78	23.2	26	909	7	0.1
(tonnes)	2017	204	25	20.7	28	891	28	0.6
	2018	199	10	23.2	1	791	29	0.1
	2019	144	1	15.6	2	572	30	0.1
	2020	78	2	6.8	1	183	34	0.0
	2021	94	6	7.8	1	283	37	0.0
	2022	94	2	27.5	1	410	13	0.0
	2023	99	2	24.1	1	428	8	0.0
	2024	71	3	23.9	1	254	8	0.0
Effort	2015	1,067	212,226	310	70,490	5,000	560	--
(a)	2016	2,000	181,622	604	57,545	5,964	798	--
	2017	1,679	58,119	262	98,302	4,775	1,206	--
	2018	2,233	16,805	324	7,836	5,204	1,031	--
	2019	2,901	2,475	382	5,668	6,956	1,264	--
	2020	1,811	5,022	241	1,697	3,968	1,275	--
	2021	2,075	9,688	92	3,301	5,191	1,519	--
	2022	2,405	2,341	150	3,779	4,942	788	--
	2023	1,784	2,566	277	2,214	5,872	907	--
	2024	1,648	7,903	203	3,719	3,955	1,004	--
Harvest Rates	2015	113.1	3.2	10.0	2.8	189.1	34.9	--
(b)	2016	79.3	1.9	38.4	2.0	152.4	9.4	--
	2017	121.5	1.4	79.2	2.1	186.6	23.0	--
	2018	89.2	1.6	71.5	0.3	151.9	28.1	--
	2019	49.7	0.1	40.7	0.6	82.2	24.1	--
	2020	42.9	1.4	28.2	0.7	46.1	26.7	--
	2021	45.1	1.2	85.3	0.5	54.4	24.4	--
	2022	39.2	0.4	183.4	0.6	83.0	15.9	--
	2023	55.6	1.3	87.1	0.1	72.8	8.4	--
	2024	43.2	0.4	118.0	0.7	64.3	7.7	--

(a) sport effort in angler-hours; gill net effort in km; trap net effort in lifts
(b) harvest rates for sport in fish/hr, gill net in kg/km, trap net in kg/lift
(c) the Ontario sport fishery harvested approximately 1,210 lbs of yellow perch in the 2024 creel survey
(*) large mesh catch rates are not targeted and therefore of limited value

Table 1.5. Harvest, effort and harvest per unit effort summaries for Lake Erie Yellow Perch fisheries in Management Unit 4 (Eastern Basin) by agency and gear type, 2015-2024.

		Unit 4						
		New York		Pennsylvania		Ontario Gill Nets		Ontario
	Year	Trap Nets	Sport	Trap Nets	Sport	Small Mesh	Large Mesh*	Trawls
Harvest	2015	12,565	64,032	0	10,055	295,833	1,083	800
(pounds)	2016	11,465	16,613	0	6,791	230,333	65	665
	2017	12,366	27,232	0	16,078	177,475	32	2,223
	2018	10,657	18,502	0	1,452	271,795	583	355
	2019	18,750	37,469	0	1,485	326,075	58	46
	2020	14,837	21,246	0	2,664	384,684	39	14
	2021	11,354	46,213	0	1,677	305,463	6,254	149
	2022	14,913	69,486	0	533	312,847	410	782
	2023	13,836	54,855	0	1,035	335,028	756	453
	2024	11,686	31,709	0	1,948	246,785	1,163	40
Harvest	2015	5.7	29.0	0	4.6	134.2	0.49	0.4
(Metric)	2016	5.2	7.5	0	3.1	104.5	0.03	0.3
(tonnes)	2017	5.6	12.4	0	7.3	80.5	0.01	1.0
	2018	4.8	8.4	0	0.7	123.3	0.26	0.2
	2019	8.5	17.0	0	0.7	147.9	0.03	0.0
	2020	6.7	9.6	0	1.2	174.5	0.02	0.0
	2021	5.1	21.0	0	0.8	138.5	2.84	0.1
	2022	6.8	31.5	0	0.2	141.9	0.19	0.4
	2023	6.3	24.9	0	0.5	151.9	0.34	0.2
	2024	5.3	14.4	0	0.9	111.9	0.53	0.0
Effort	2015	357	44,029	0	18,638	1,774	44.7	--
(a)	2016	248	27,436	0	11,934	1,303	11.2	--
	2017	208	26,154	0	12,843	565	6.0	--
	2018	135	19,035	0	3,940	887	58.7	--
	2019	224	30,166	0	2,730	947	29.7	--
	2020	136	18,677	0	1,294	1,492	34.4	--
	2021	137	29,237	0	1,598	2,081	67.1	--
	2022	241	49,968	0	600	1,317	33.6	--
	2023	214	33,059	0	453	1,652	79.7	--
	2024	172	16,672	0	2,305	1,570	179.0	--
Harvest Rates	2015	16.0	2.01	--	1.2	75.6	11.0	--
(b)	2016	21.0	0.95	--	1.3	80.1	2.6	--
	2017	27.0	1.35	--	1.2	142.3	2.4	--
	2018	35.8	1.53	--	0.4	139.0	4.5	--
	2019	38.0	1.81	--	0.6	156.1	0.9	--
	2020	49.5	1.55	--	1.2	117.0	0.5	--
	2021	37.6	2.04	--	0.4	66.6	42.3	--
	2022	28.1	1.90	--	0.0	107.7	5.5	--
	2023	29.3	2.55	--	1.3	92.0	4.3	--
	2024	30.8	2.61	--	0.6	71.3	2.9	--

(a) sport effort in angler-hours; gill net effort in km; trap net effort in lifts
(b) harvest rates for sport in fish/hr, gill net in kg/km, trap net in kg/lift
(c) the Ontario sport fishery harvested approximately 9,977 lbs of yellow perch in the 2024 creel survey
(*) large mesh catch rates are not targeted and therefore of limited value

Table 1.6. Estimated 2024 Lake Erie Yellow Perch harvest by age and numbers of fish by gear and management unit (Unit).

		Unit 1		**Unit 2**		**Unit 3**		**Unit 4**		**Lakewide**	
Gear	Age	Number	%	Number	%	Number	%	Number	%	Number	%
Gill Nets	1	980	0.0	2,847	0.4	0	0.0	0	0.0	3,827	0.1
	2	451,212	12.4	108,855	15.4	129,268	7.3	137,537	19.0	826,872	12.1
	3	2,841,254	78.1	455,624	64.6	628,817	35.5	257,047	35.6	4,182,743	61.2
	4	252,903	6.9	93,026	13.2	570,970	32.2	246,242	34.1	1,163,140	17.0
	5	69,669	1.9	38,239	5.4	393,370	22.2	71,357	9.9	572,635	8.4
	6+	23,437	0.6	7,027	1.0	49,132	2.8	10,633	1.5	90,228	1.3
	Total	3,639,455	*58.5*	705,617	*74.5*	1,771,556	*79.6*	722,816	*90.7*	6,839,445	*67.1*
Trap Nets	1	0	0.0	0	0.0	734	0.2	0	0.0	734	0.0
	2	215,385	17.4	0	0.0	70,917	16.2	0	0.0	286,302	15.1
	3	904,711	73.2	149,065	76.0	226,289	51.6	4,377	18.1	1,284,442	67.8
	4	86,309	7.0	28,144	14.3	67,556	15.4	9,888	40.9	191,897	10.1
	5	19,172	1.6	10,287	5.2	45,505	10.4	5,998	24.8	80,962	4.3
	6+	10,281	0.8	8,733	4.5	27,607	6.3	3,890	16.1	50,511	2.7
	Total	1,235,858	*19.9*	196,229	*20.7*	438,608	*19.7*	24,153	*3.0*	1,894,848	*18.6*
Sport	1	69,701	5.2	653	1.4	11	0.1	0	0.0	70,365	4.8
	2	486,291	36.0	2,904	6.4	114	0.7	1,013	2.0	490,322	33.6
	3	690,591	51.2	26,765	59.2	5,551	35.0	9,251	18.5	732,158	50.1
	4	78,653	5.8	4,893	10.8	3,183	20.1	16,391	32.7	103,120	7.1
	5	19,424	1.4	3,463	7.7	3,294	20.8	11,451	22.9	37,632	2.6
	6+	5,255	0.4	6,555	14.5	3,715	23.4	12,005	24.0	27,530	1.9
	Total	1,349,915	*21.7*	45,233	*4.8*	15,868	*0.7*	50,111	*6.3*	1,461,127	*14.3*
All Gear	1	70,680	1.1	3,500	0.4	745	0.0	0	0.0	74,925	0.7
	2	1,152,889	18.5	111,759	11.8	200,299	9.0	138,550	17.4	1,603,496	15.7
	3	4,436,557	71.3	631,454	66.7	860,657	38.7	270,675	34.0	6,199,343	60.8
	4	417,865	6.7	126,063	13.3	641,709	28.8	272,521	34.2	1,458,158	14.3
	5	108,265	1.7	51,989	5.5	442,168	19.9	88,807	11.1	691,229	6.8
	6+	38,973	0.6	22,315	2.4	80,454	3.6	26,528	3.3	168,270	1.7
	Total	6,225,228	61.1	947,079	9.3	2,226,032	21.8	797,080	7.8	10,195,420	100.0

Note: Values in *italics* delineate harvest percentage by gear in each Unit, while the values in the 'All Gear' boxes are for lakewide harvest percentage by Unit.

Table 1.7. Yellow Perch stock size (millions of fish) in each Lake Erie management unit. Estimated abundance in the years 2006 to 2024 and projected abundance in 2025 from the ADMB catch-age analysis.

	Age	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Unit 1	2	3.127	14.480	17.067	35.521	26.605	10.037	12.153	2.540	6.736	19.294	43.300	11.564	3.468	4.955	21.648	10.095	12.925	42.508	20.183	19.614
	3	40.699	2.002	9.270	11.070	22.659	16.705	6.290	7.493	1.519	4.096	11.503	24.474	6.594	2.027	2.889	11.637	5.332	7.004	22.955	11.580
	4	2.017	23.151	1.161	5.602	6.290	12.262	8.998	3.281	3.525	0.741	1.873	4.355	9.455	2.698	0.771	0.814	3.069	1.561	2.087	8.198
	5	9.928	1.031	12.549	0.672	2.929	3.050	5.906	4.311	1.342	1.483	0.283	0.523	1.224	2.793	0.645	0.113	0.106	0.476	0.256	0.434
	6+	9.576	10.911	7.434	12.073	7.852	6.193	5.228	6.075	5.325	3.671	2.647	1.434	0.879	0.803	1.000	0.489	0.203	0.098	0.113	0.100
	2 and Older	65.347	51.575	47.481	64.938	66.336	48.247	38.575	23.700	18.447	29.286	59.607	42.350	21.620	13.276	26.953	23.148	21.635	51.647	45.593	39.926
	3 and Older	62.220	37.095	30.414	29.417	39.731	38.210	26.422	21.160	11.711	9.992	16.307	30.786	18.152	8.321	5.305	13.053	8.710	9.139	25.411	20.312
Unit 2	2	7.056	22.957	24.337	55.446	41.625	7.184	17.696	10.746	25.786	7.702	24.673	10.150	4.546	4.254	9.289	9.473	9.407	33.427	15.819	12.780
	3	112.992	4.578	15.133	16.050	36.228	27.301	4.710	11.544	6.941	16.618	4.886	15.759	6.474	2.892	2.692	5.950	6.235	6.225	22.225	10.519
	4	2.271	62.933	2.773	9.269	9.260	21.397	16.070	2.685	6.205	3.635	7.848	2.409	7.771	3.161	1.345	1.343	3.550	3.822	3.973	14.220
	5	16.550	1.056	34.167	1.554	4.593	4.799	11.019	7.726	1.149	2.496	1.183	2.786	0.866	2.761	1.002	0.488	0.709	1.964	2.324	2.429
	6+	3.145	8.580	4.952	20.997	10.554	7.386	5.917	7.484	5.907	2.559	1.422	0.812	1.155	0.657	0.943	0.626	0.566	0.672	1.581	2.355
	2 and Older	142.014	100.103	81.361	103.316	102.260	68.067	55.412	40.185	45.989	33.010	40.011	31.916	20.812	13.726	15.272	17.881	20.466	46.110	45.922	42.303
	3 and Older	134.958	77.146	57.025	47.870	60.635	60.883	37.716	29.439	20.203	25.308	15.338	21.766	16.266	9.471	5.983	8.408	11.060	12.683	30.103	29.523
Unit 3	2	8.812	35.222	44.910	63.312	54.431	13.277	29.035	22.081	40.969	8.005	32.075	11.591	13.743	9.134	9.815	19.172	13.602	27.095	21.810	36.153
	3	86.007	5.847	23.437	29.936	42.159	36.212	8.827	19.262	14.647	27.104	5.294	21.131	7.651	9.033	5.945	6.486	12.650	8.986	17.904	14.490
	4	2.612	52.565	3.689	15.035	19.063	26.477	22.617	5.393	11.800	8.797	16.127	3.023	12.257	4.235	4.532	3.463	3.725	7.346	5.233	10.997
	5	12.066	1.367	30.053	2.209	8.825	10.767	14.744	11.901	2.855	5.930	4.309	7.096	1.383	4.938	1.310	2.093	1.540	1.710	3.390	2.788
	6+	5.465	8.363	5.150	20.127	12.190	11.017	11.203	12.335	11.589	6.333	5.266	3.532	4.194	1.830	1.578	1.153	1.237	1.099	1.125	2.205
	2 and Older	114.962	103.364	107.239	130.619	136.668	97.750	86.427	70.972	81.860	56.169	63.072	46.374	39.228	29.170	23.180	32.365	32.755	46.235	49.463	66.633
	3 and Older	106.150	68.142	62.328	67.307	82.236	84.473	57.392	48.891	40.891	48.165	30.997	34.782	25.486	20.036	13.365	13.194	19.153	19.140	27.652	30.480
Unit 4	2	0.746	6.407	4.272	4.810	6.185	0.692	6.860	1.448	2.763	0.523	2.579	3.195	9.167	1.042	1.637	4.607	5.193	3.515	3.538	2.079
	3	4.013	0.486	4.214	2.806	3.141	3.998	0.444	4.362	0.909	1.710	0.324	1.604	2.046	5.678	0.650	1.016	2.802	3.266	2.206	2.248
	4	0.346	2.375	0.300	2.587	1.676	1.799	2.204	0.236	2.196	0.432	0.815	0.157	0.882	0.978	2.787	0.313	0.449	1.424	1.649	1.175
	5	0.947	0.183	1.360	0.170	1.381	0.834	0.829	0.950	0.092	0.770	0.152	0.299	0.072	0.317	0.366	1.015	0.097	0.178	0.560	0.719
	6+	1.125	1.156	0.813	1.257	0.806	1.149	1.001	0.871	0.793	0.425	0.479	0.307	0.306	0.190	0.218	0.253	0.449	0.268	0.211	0.364
	2 and Older	7.177	10.607	10.959	11.630	13.189	8.472	11.339	7.868	6.753	3.860	4.349	5.562	12.474	8.205	5.658	7.203	8.991	8.650	8.165	6.584
	3 and Older	6.431	4.200	6.687	6.820	7.004	7.779	4.478	6.420	3.990	3.337	1.770	2.367	3.307	7.163	4.021	2.597	3.798	5.135	4.627	4.505

Table 2.1. Parameters of the stock-recruitment relationship, spawning stock biomass, limit reference point and target fishing rate for each management unit. (F_{actual} may be reduced from F_{target} if P(SSB<Bmsy) ≥ P*).

	Spawn/ Recruit Relationship Parameters			Spawning Stock Biomass (Unfished Population)		Spawning Stock Biomass (kgs)		Biomass at MSY (Limit Reference Point)			Fishing Rate			
Unit	**log(alpha)**	**beta**	**sigma**	**SSB_0**	**sd($logSSB_0$)**	**2025**	**2026[a]**	**B_{msy}**	**%SSB_0**	**P**	**F_{msy}**	**% F_{msy}**	**F_{target}**	**F_{actual}**
MU1	2.22	1.67E-07	0.97	10,914,000	0.20	3,517,270	4,279,540	2,817,003	26%	0.06	0.99	28%	0.277	0.277
MU2	2.10	1.30E-07	0.97	15,036,800	0.23	6,812,250	5,766,460	4,199,609	28%	0.11	1.58	35%	0.553	0.553
MU3	2.14	1.33E-07	0.97	14,032,300	0.22	5,810,740	6,634,030	3,872,039	28%	0.03	1.63	32%	0.522	0.522
MU4	2.07	1.12E-06	0.96	1,798,920	0.19	1,109,890	910,829	512,499	28%	0.01	1.57	34%	0.534	0.534

(a) Spawning stock biomass when population is fished at target fishing rate

Table 2.2. Estimated harvest range of Lake Erie Yellow Perch for 2025 using the proposed fishing policy and selectivity-at-age from combined fishing gears.

		2025 Stock Size (millions of fish)			2025 Mean Biomass	Exploitation Rate				2025 Catch (millions of fish)			3-yr Mean Weight in	2025 Harvest Range Catch (millions of lbs)		
	Age	**Min.**	**Mean**	**Max.**	**mil. lbs**	**F**	**s(age)**	**F(age)**	**(u)**	**Min.**	**Mean**	**Max.**	Harvest (kg)	**Min.**	**Mean**	**Max.**
Unit 1	2	12.575	19.614	26.653	4.609	0.277	0.212	0.059	0.047	0.593	0.924	1.256	0.126	0.165	0.257	0.349
	3	9.161	11.580	13.999	3.829	0.277	0.675	0.187	0.141	1.296	1.638	1.980	0.151	0.431	0.545	0.659
	4	6.184	8.198	10.213	3.456	0.277	1.000	0.277	0.201	1.245	1.651	2.057	0.183	0.502	0.666	0.830
	5	0.282	0.434	0.587	0.212	0.277	0.996	0.276	0.201	0.057	0.087	0.118	0.218	0.027	0.042	0.057
	6+	0.056	0.100	0.143	0.058	0.277	0.295	0.082	0.065	0.004	0.006	0.009	0.285	0.002	0.004	0.006
	Total	28.257	39.926	51.595	12.166				0.108	3.194	4.307	5.420	0.159	1.126	1.514	1.900
	(3+)	15.683	20.312	24.942	7.556				0.167	2.601	3.382	4.164	0.169	0.963	1.257	1.551
Unit 2	2	9.175	12.780	16.384	3.291	0.553	0.090	0.050	0.040	0.367	0.511	0.655	0.144	0.116	0.162	0.208
	3	8.790	10.519	12.248	4.211	0.553	0.432	0.239	0.176	1.550	1.855	2.160	0.160	0.547	0.654	0.762
	4	12.185	14.220	16.254	7.539	0.553	0.812	0.449	0.303	3.688	4.304	4.920	0.189	1.537	1.793	2.050
	5	2.068	2.429	2.790	1.548	0.553	1.000	0.553	0.356	0.737	0.866	0.995	0.213	0.346	0.407	0.467
	6+	1.977	2.355	2.733	1.895	0.553	1.000	0.553	0.357	0.705	0.840	0.974	0.318	0.494	0.589	0.683
	Total	34.196	42.303	50.410	18.485				0.198	7.048	8.376	9.704	0.195	3.035	3.605	4.170
	(3+)	25.021	29.523	34.025	15.194				0.266	6.681	7.865	9.049	0.199	2.924	3.443	3.962
Unit 3	2	24.527	36.153	47.779	6.783	0.522	0.030	0.015	0.013	0.309	0.456	0.602	0.127	0.087	0.128	0.169
	3	11.799	14.490	17.181	4.316	0.522	0.243	0.127	0.099	1.162	1.427	1.692	0.147	0.377	0.463	0.548
	4	9.139	10.997	12.854	4.691	0.522	0.611	0.319	0.227	2.078	2.501	2.923	0.165	0.756	0.910	1.063
	5	2.272	2.788	3.304	1.477	0.522	0.842	0.439	0.297	0.675	0.829	0.982	0.189	0.281	0.345	0.409
	6+	1.703	2.205	2.708	1.794	0.522	1.000	0.522	0.341	0.580	0.752	0.923	0.231	0.295	0.383	0.470
	Total	49.439	66.633	83.827	19.060				0.090	4.805	5.965	7.124	0.169	1.793	2.228	2.660
	(3+)	24.912	30.480	36.048	12.278				0.181	4.496	5.509	6.521	0.173	1.710	2.100	2.491
Unit 4	2	1.428	2.079	2.731	0.507	0.534	0.100	0.054	0.043	0.061	0.090	0.118	0.145	0.020	0.029	0.038
	3	1.801	2.248	2.694	1.011	0.534	0.445	0.238	0.176	0.316	0.395	0.473	0.162	0.113	0.141	0.169
	4	0.938	1.175	1.412	0.689	0.534	0.885	0.473	0.315	0.296	0.370	0.445	0.175	0.114	0.143	0.172
	5	0.540	0.719	0.898	0.515	0.534	1.000	0.534	0.347	0.187	0.249	0.312	0.208	0.086	0.114	0.143
	6+	0.262	0.364	0.465	0.320	0.534	0.662	0.353	0.248	0.065	0.090	0.115	0.278	0.040	0.055	0.071
	Total	4.969	6.584	8.199	3.042				0.181	0.926	1.194	1.463	0.183	0.372	0.482	0.592
	(3+)	3.542	4.505	5.468	2.534				0.245	0.865	1.105	1.345	0.186	0.353	0.454	0.554

Table 2.3. Lake Erie Yellow Perch fishing rates and the Recommended Allowable Harvest (RAH; in millions of pounds) for 2025 by Management Unit (Unit). RAH values may be subject to a limit on the annual change in TAC (±20%).

	Fishing	**Recommended Allowable Harvest (millions lbs.)**			±20% of previous year TAC	
Unit	**Rate**	**MIN**	**MEAN**	**MAX**	MIN (-20%)	MAX (+20%)
1	0.277	1.126	1.514	1.900	2.289	3.433
2			See Text Page 9		0.458	0.686
3	0.522	1.793	2.228	2.660	2.123	3.185
4	0.534	0.372	0.482	0.592	0.374	0.560

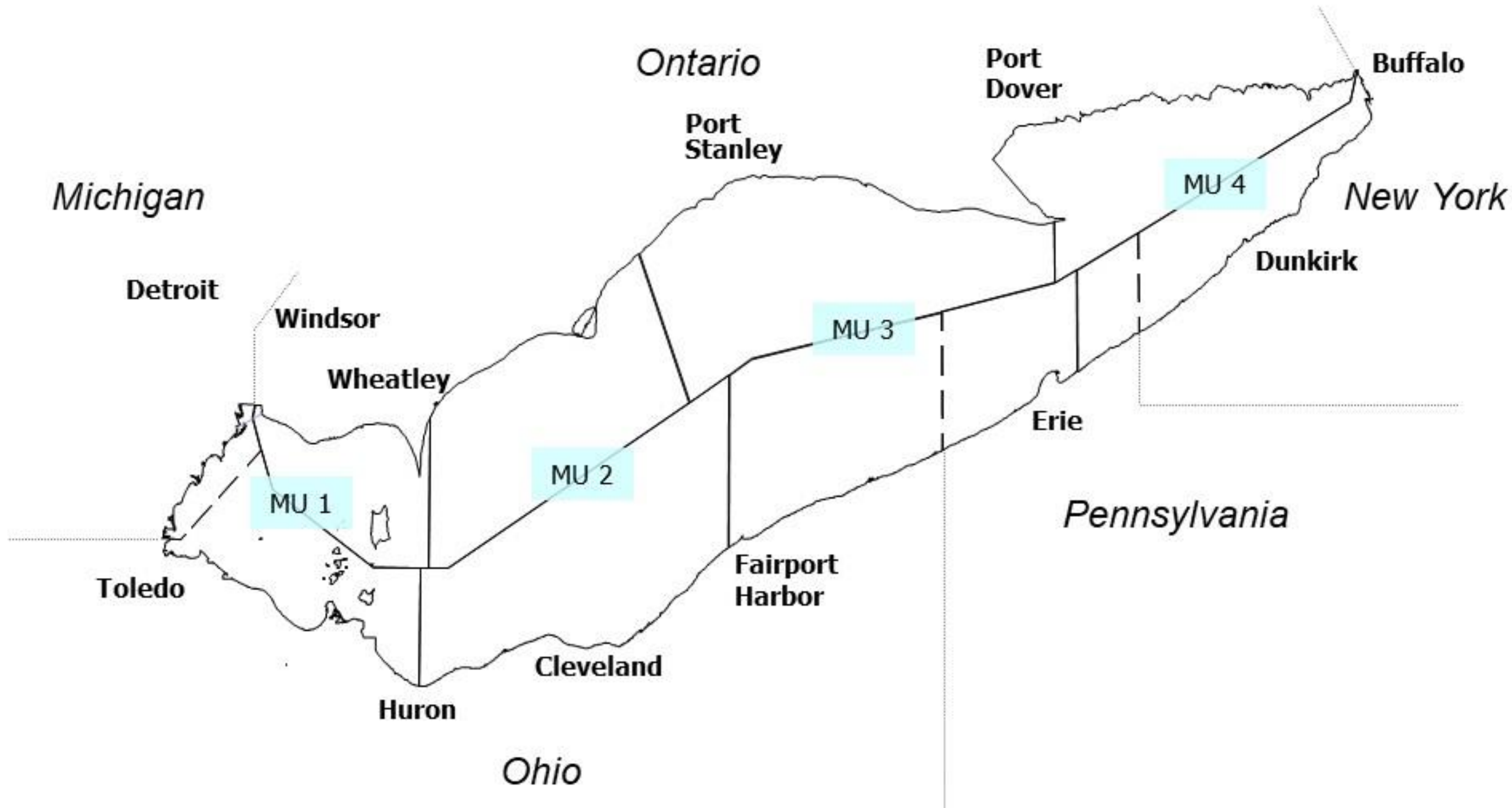


Figure 1.1. The Yellow Perch Management Units (MUs) of Lake Erie defined by the YPTG and LEC, for illustrative purposes.

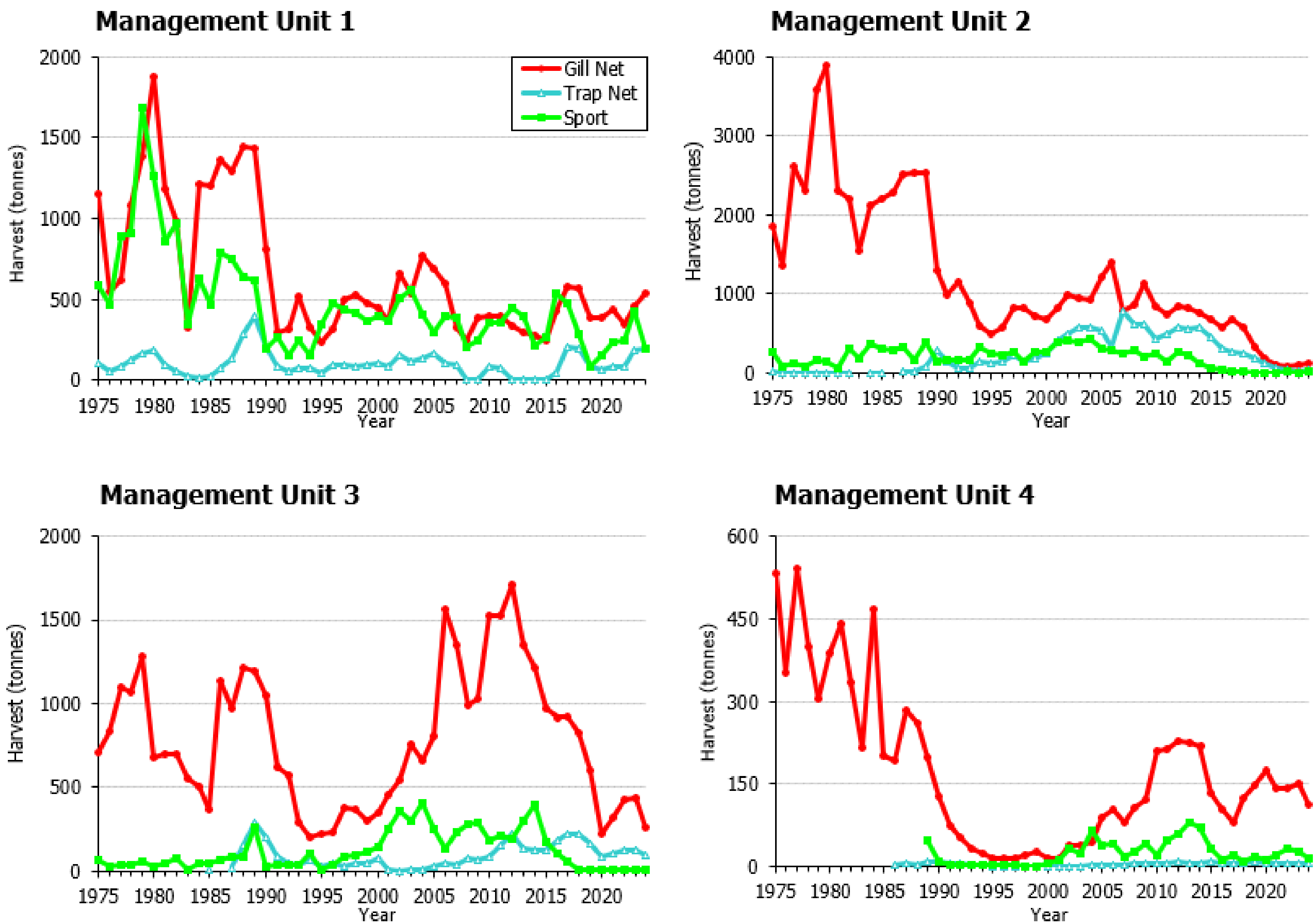


Figure 1.2. Historic Lake Erie Yellow Perch harvest (metric tonnes) by management unit and gear type.

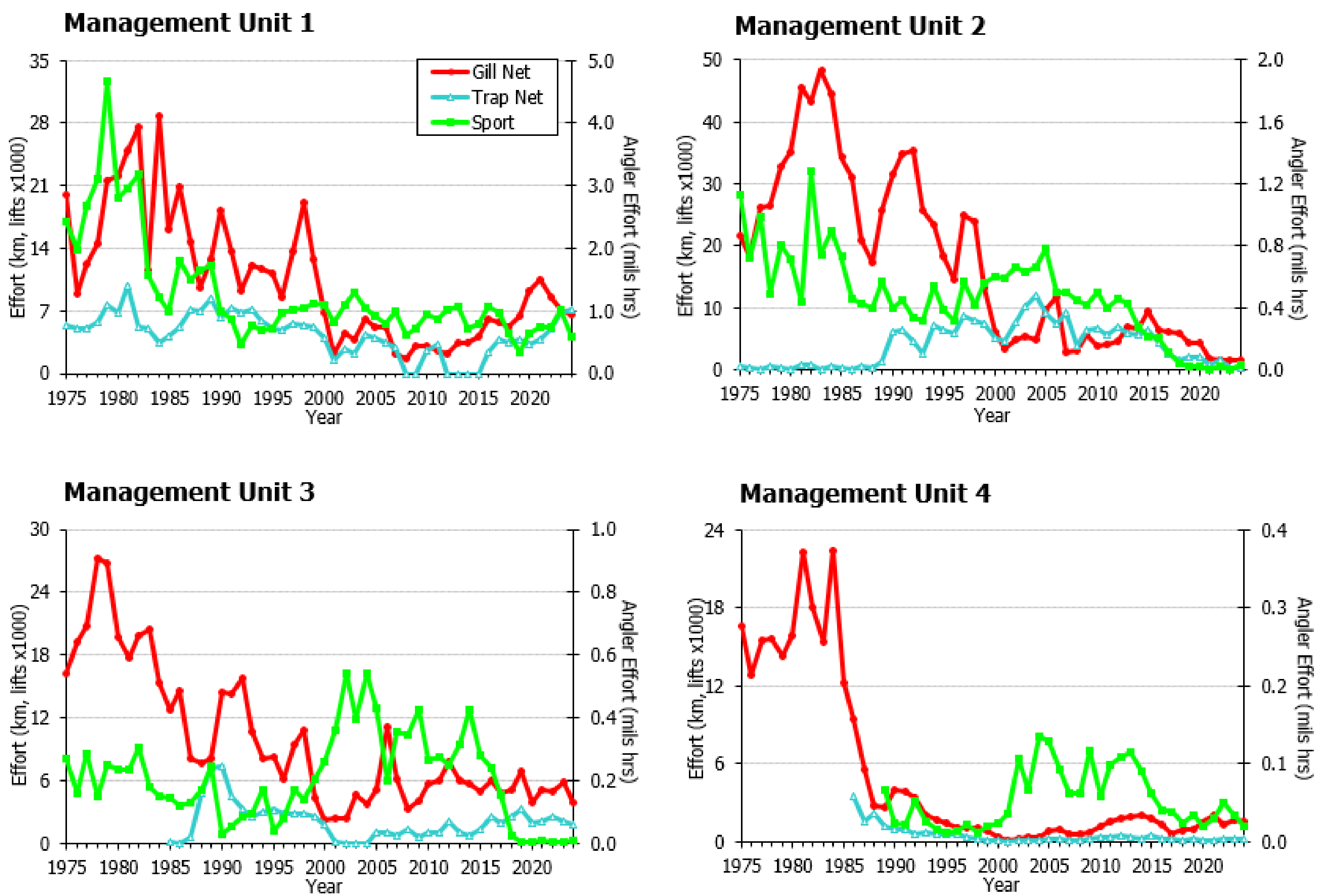


Figure 1.3. Historic Lake Erie Yellow Perch effort by management unit and gear type. Note: gill net effort presented is targeted effort with small mesh (< 3″).

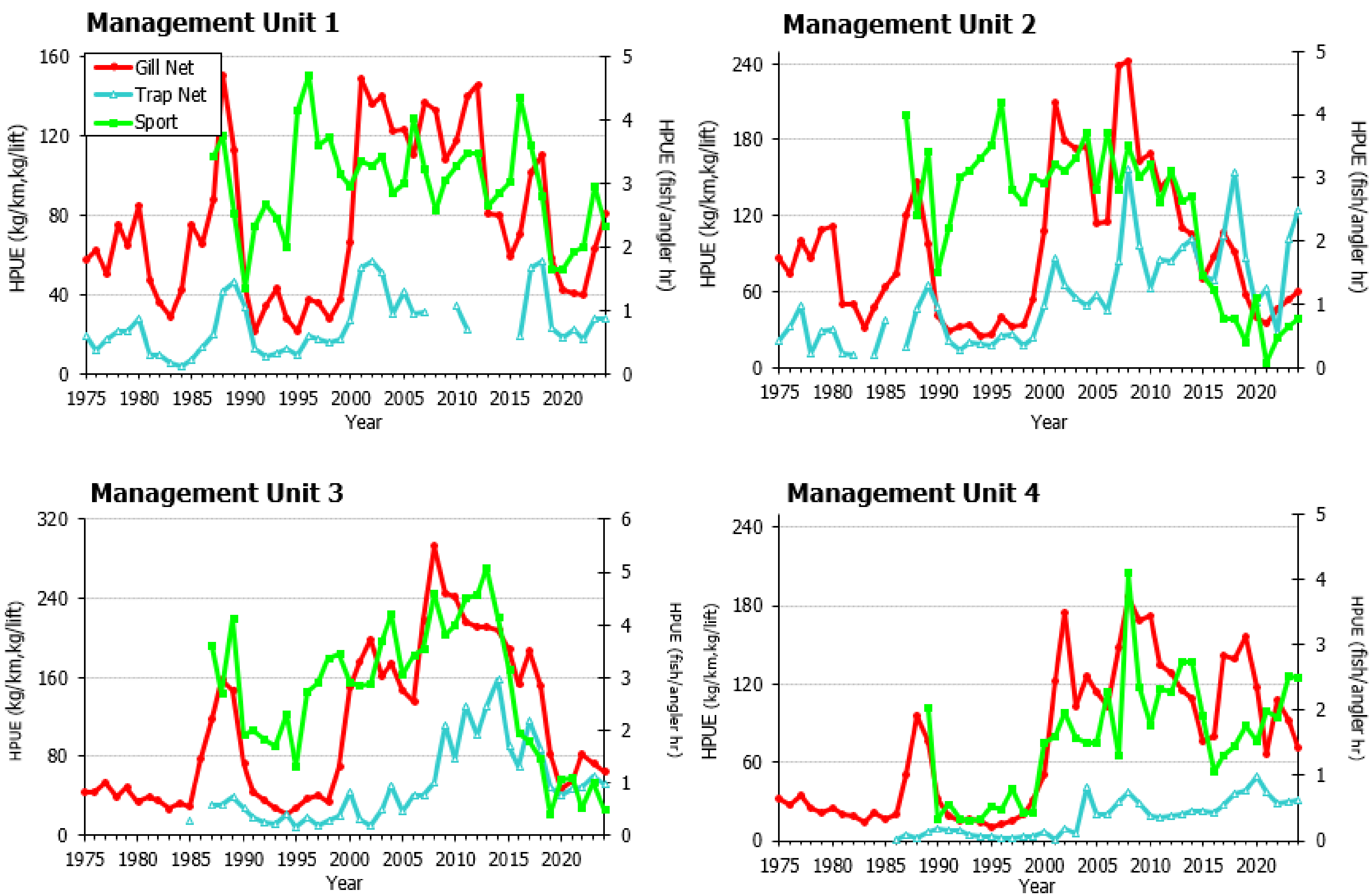


Figure 1.4. Historic Lake Erie Yellow Perch harvest per unit effort (HPUE) by management unit and gear type.
Note: gill net CPUE for 2001 to 2024 is for small mesh (< 3″) only.

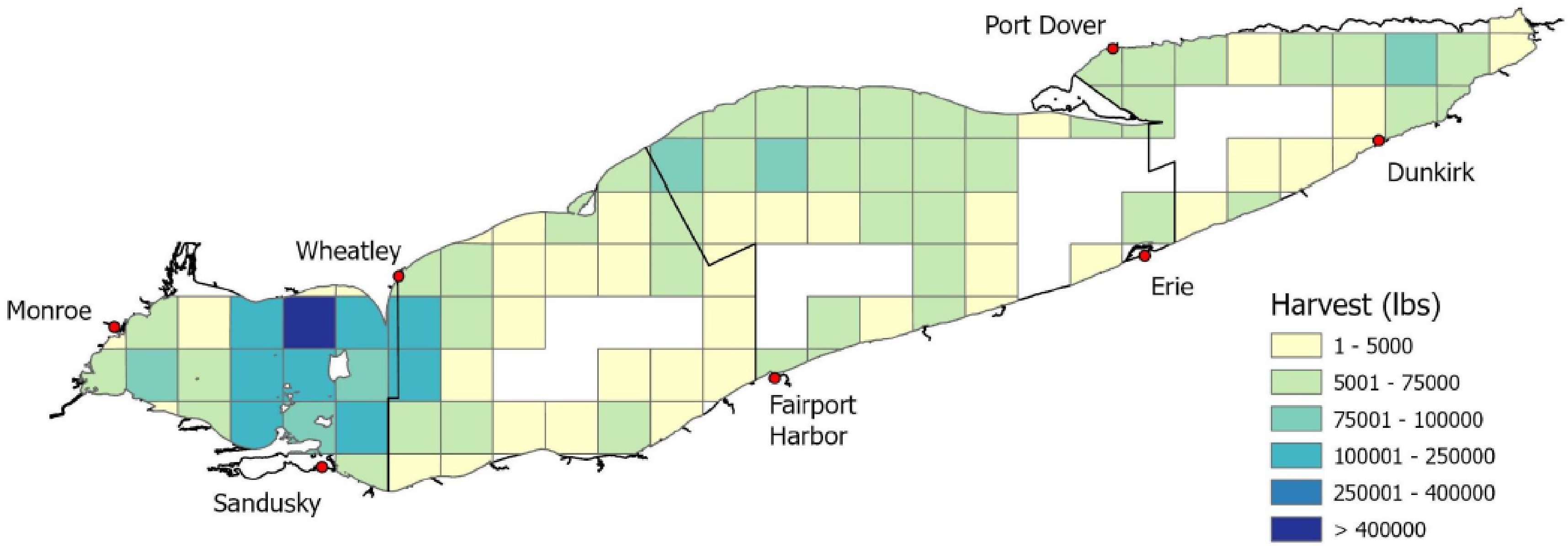


Figure 1.5. Spatial distribution of Yellow Perch total harvest (lbs.) in 2024 by 10-minute grid.

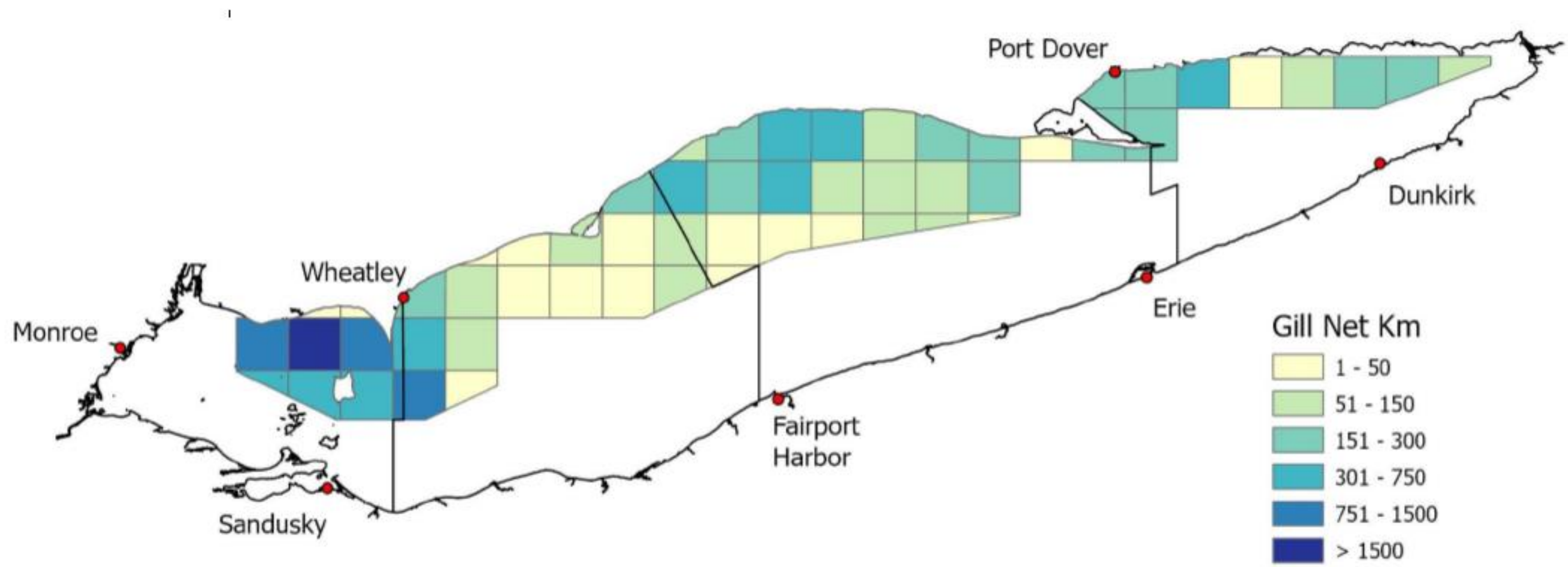


Figure 1.6. Spatial distribution of Yellow Perch small mesh gill net effort (km) in 2024 by 10-minute grid.

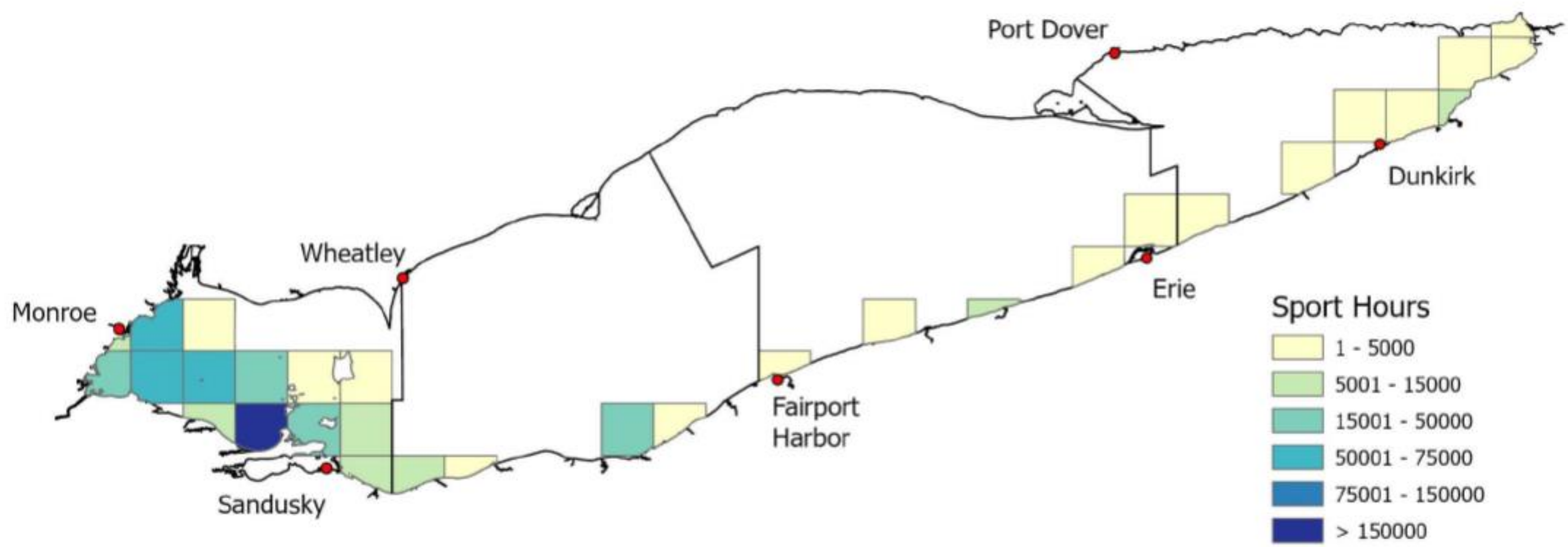


Figure 1.7. Spatial distribution of Yellow Perch sport effort (angler hours) in 2024 by 10-minute grid.

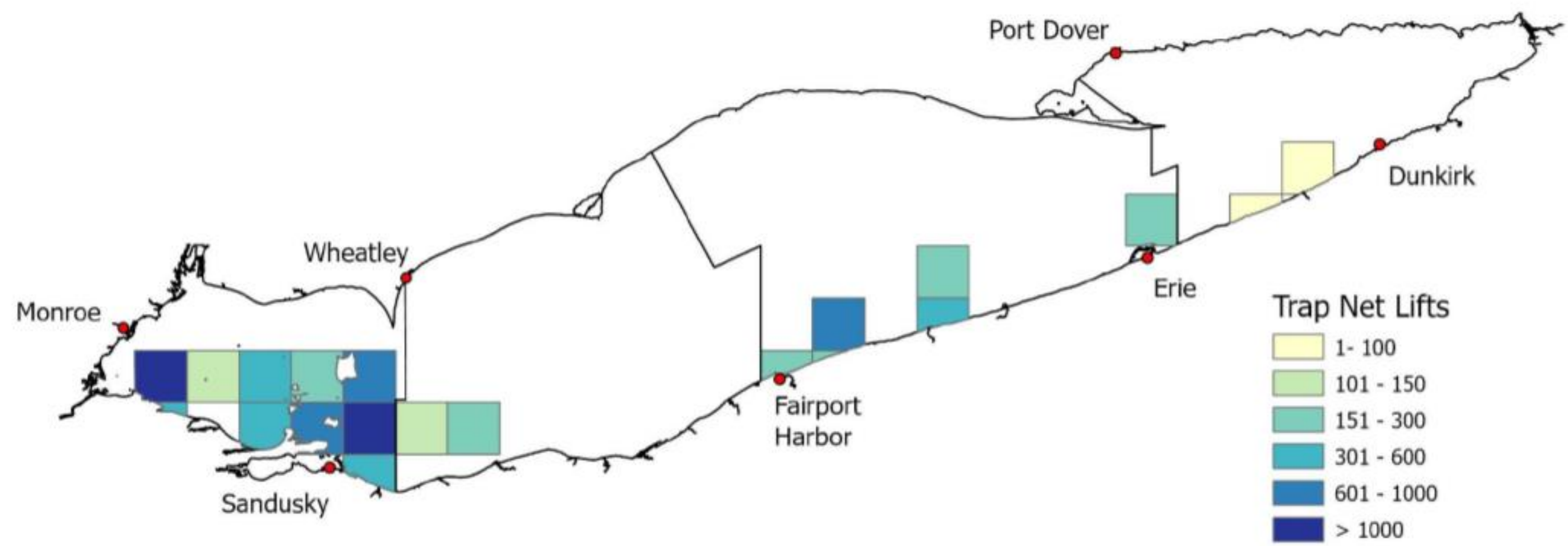


Figure 1.8. Spatial distribution of Yellow Perch trap net effort (lifts) in 2024 by 10-minute grid.

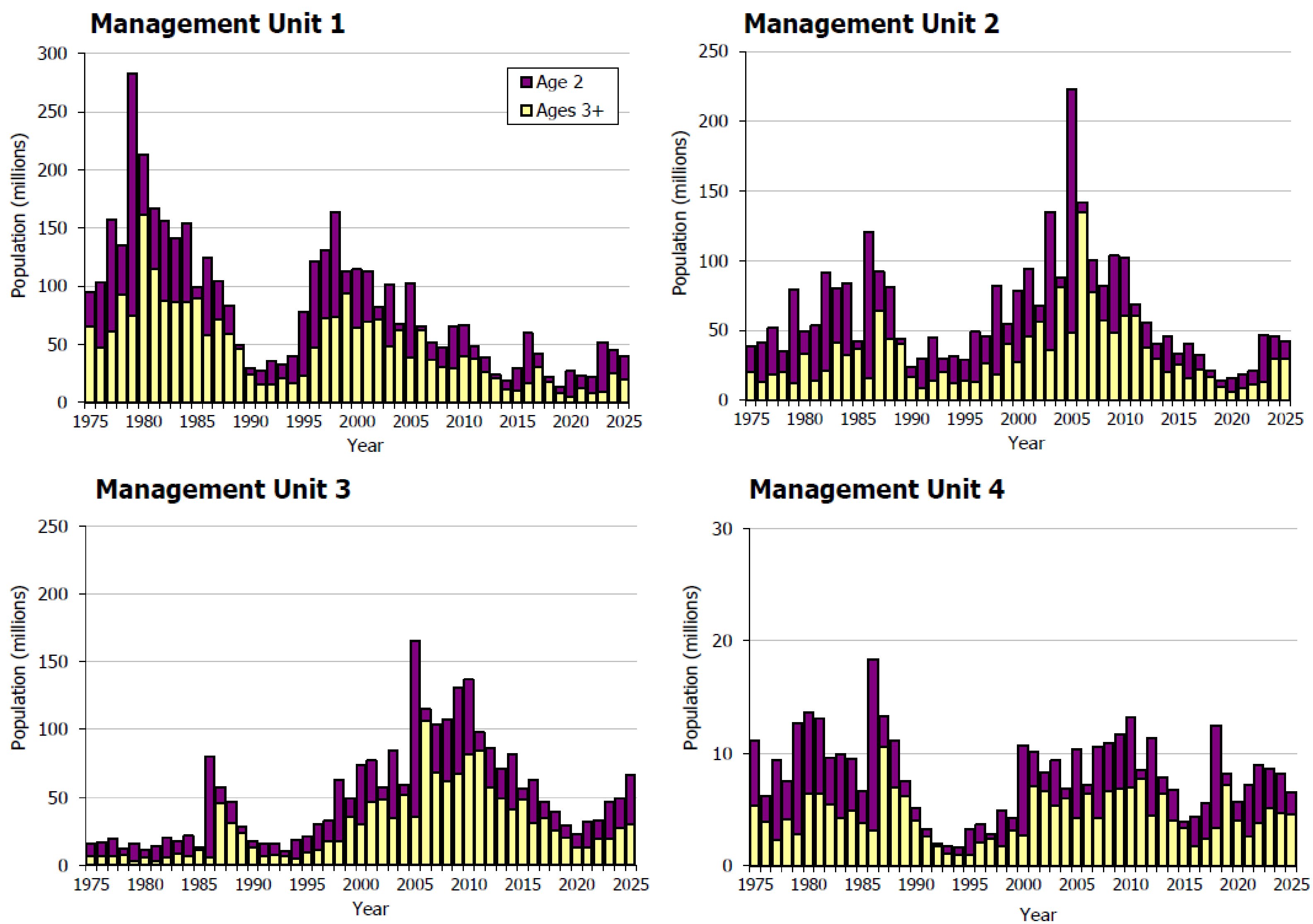


Figure 1.9. Lake Erie Yellow Perch population estimates by management unit for age 2 (dark bars) and ages 3+ (light bars), 1975 to 2025, from the ADMB model.

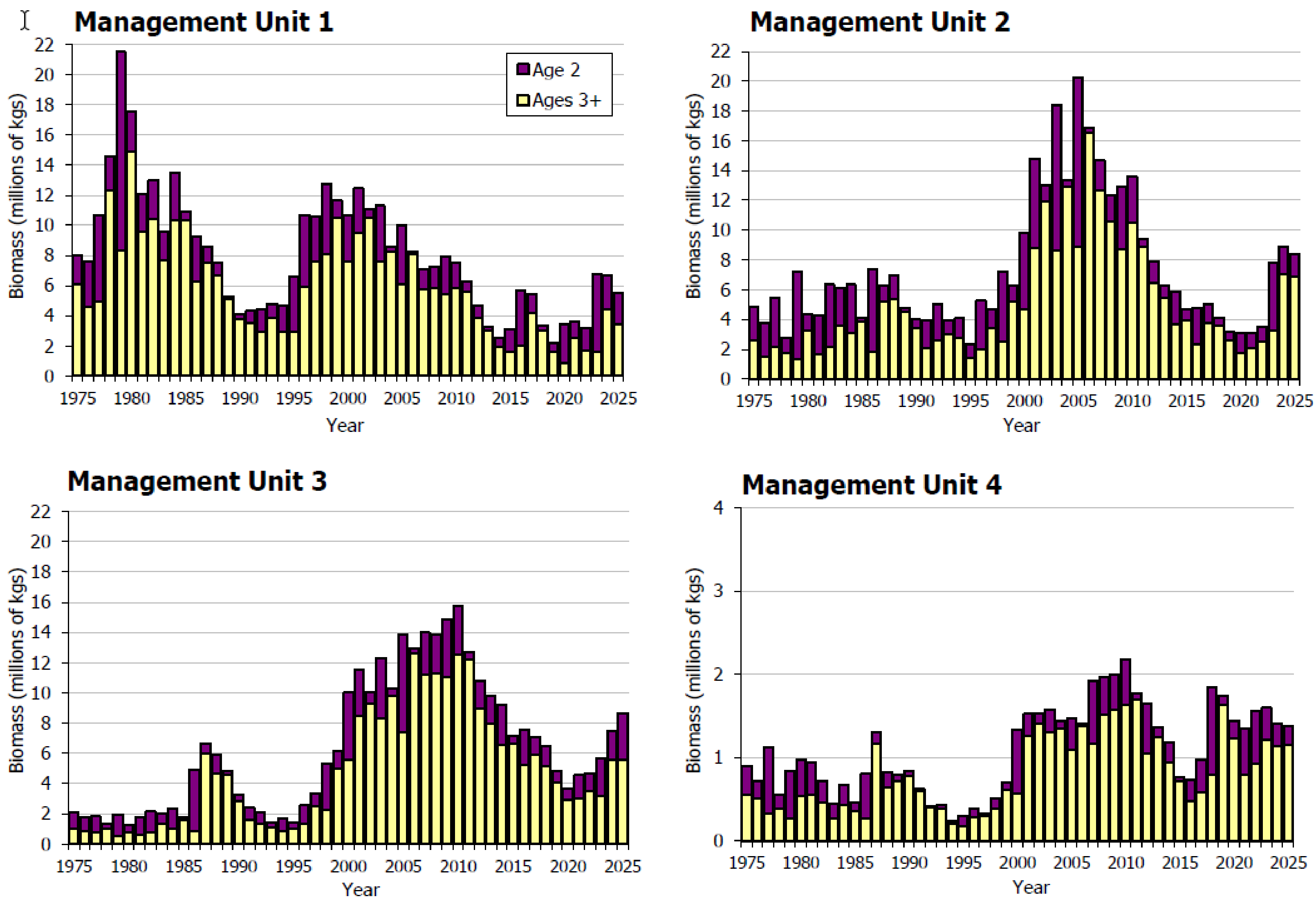


Figure 1.10. Lake Erie Yellow Perch biomass estimates by management unit for age 2 (dark bars) and ages 3+ (light bars), 1975 to 2025, from the ADMB model.

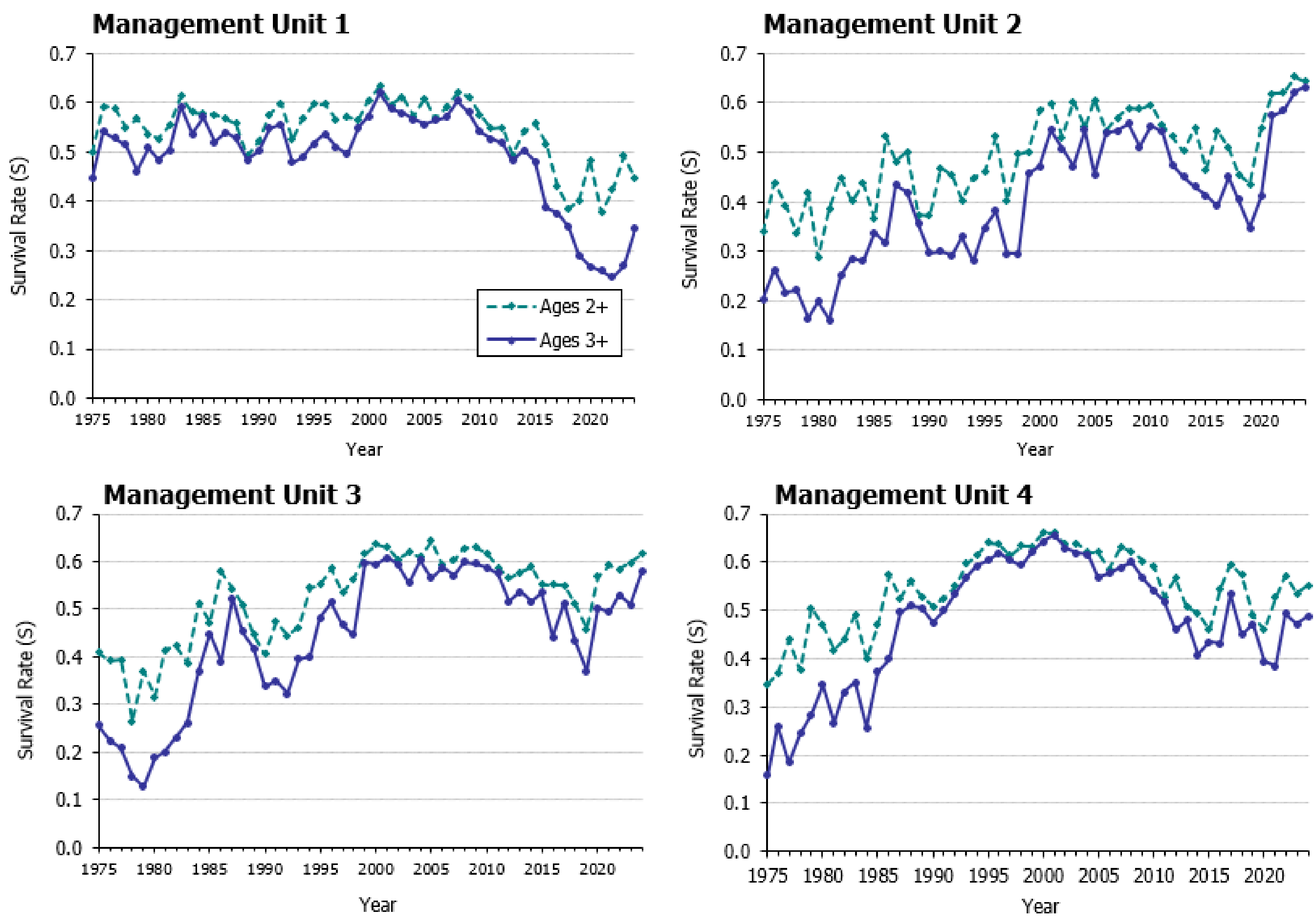


Figure 1.11. Lake Erie Yellow Perch survival rates by management unit for ages 2+ (dashed line) and ages 3+ (solid line).

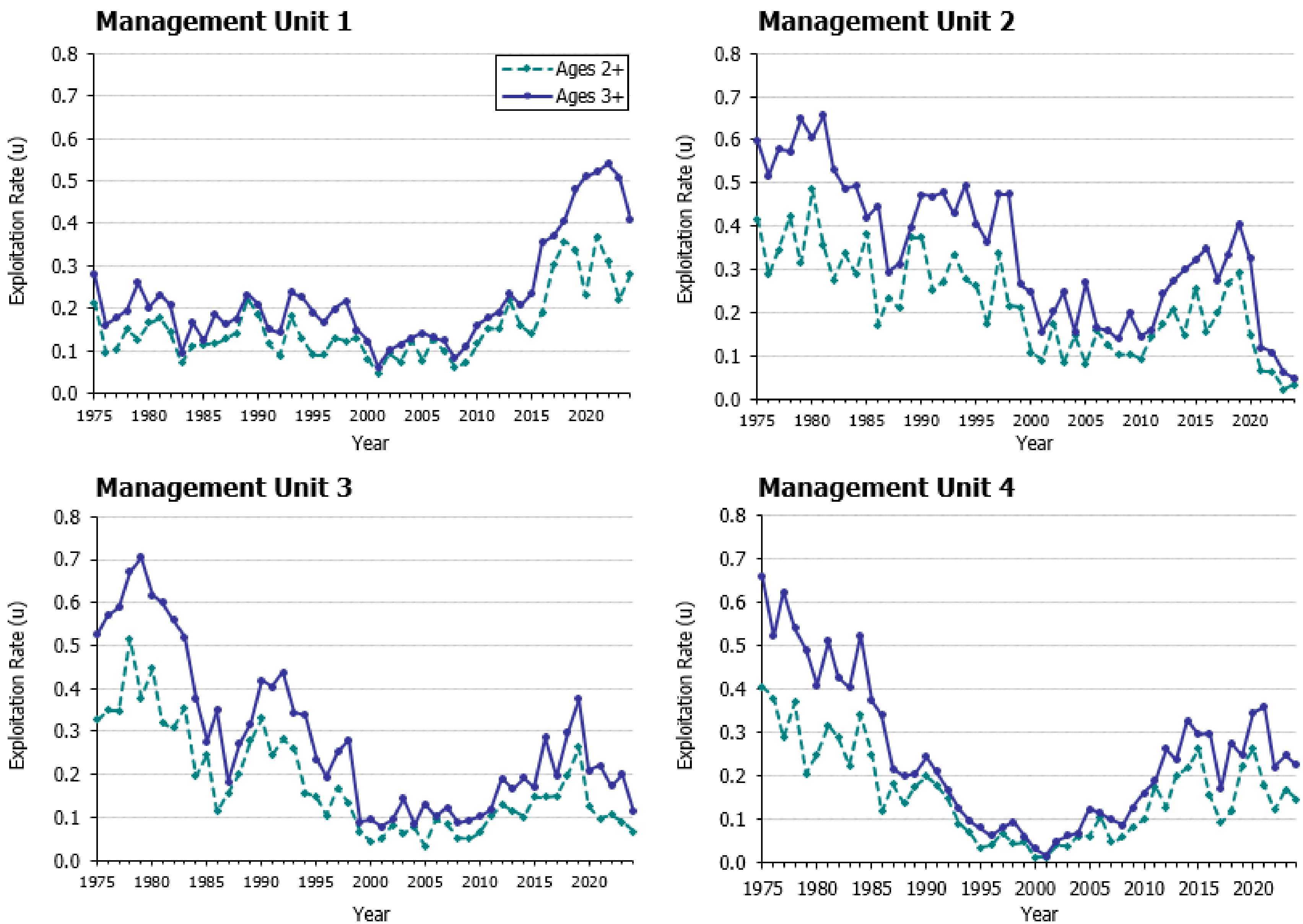
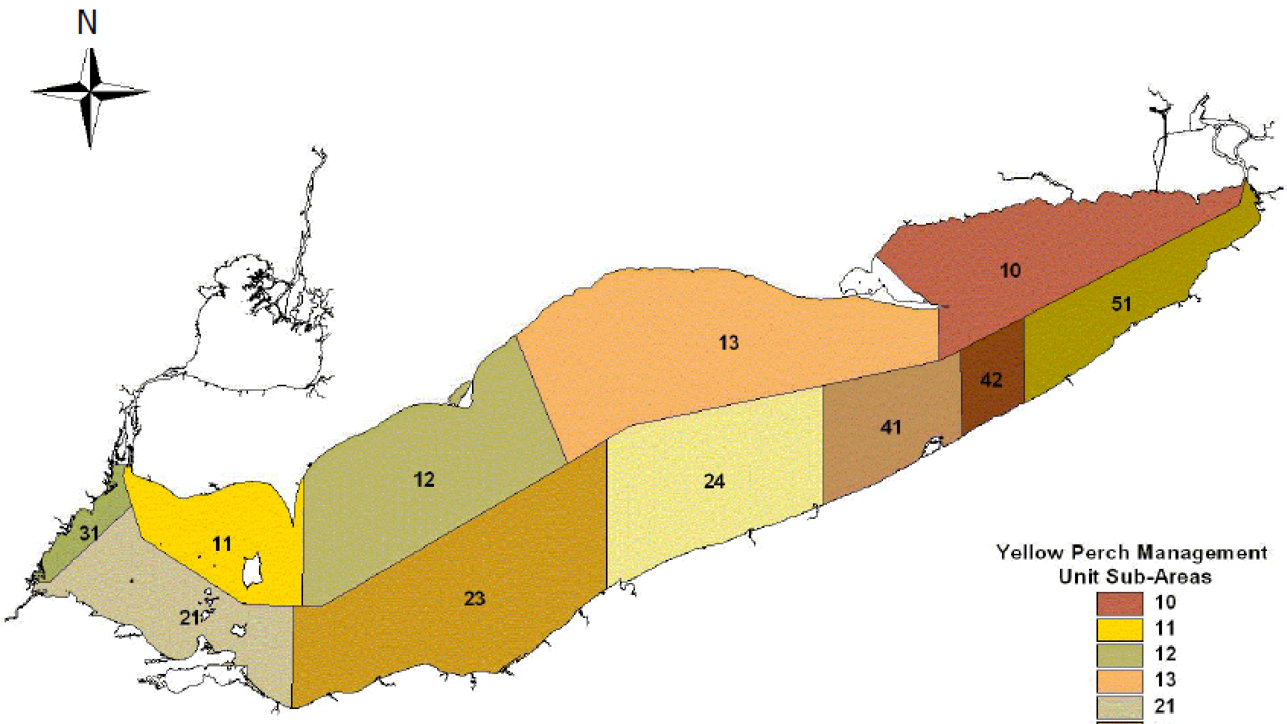


Figure 1.12. Lake Erie Yellow Perch exploitation rates by management unit for ages 2+ (dashed line) and ages 3+ (solid line).



Management Unit	Sub-Area	Jurisdiction	Area Estimate (km2)	New Relative Surface Area
MU1	11	Ontario	1537.1	**40.6%**
	31	Michigan	344.8	**9.1%**
	21	Ohio	1905.6	**50.3%**
		MU1 Total	**3787.5**	
MU2	12	Ontario	3497.4	**45.6%**
	23	Ohio	4175.3	**54.4%**
		MU2 Total	**7672.7**	
MU3	13	Ontario	4749.9	**52.3%**
	24	Ohio	2943.7	**32.4%**
	41	Pennsylvania	1385.8	**15.3%**
		MU3 Total	**9079.4**	
MU4	10	Ontario	2818.7	**58.0%**
	42	Pennsylvania	535.6	**11.0%**
	51	New York	1507.2	**31.0%**
		MU4 Total	**4861.4**	

Figure 2.1. Calculations for subunit areas in the Yellow Perch Task Group Management Units.

Appendix Table 1. Expert Opinion (EO) Lambda (λ) values and relative number of terms associated with catch-at-age analysis data sources by management unit (Unit).

Unit	Data Source	λ	Relative Number of Terms
1	Commercial Gill Net Effort	0.8	1
	Sport Effort	0.7	1
	Commercial Trap Net Effort	0.5	1
	Commercial Gill Net Harvest	1.0	5
	Sport Harvest	0.9	5
	Commercial Trap Net Harvest	0.7	5
	Trawl Survey Catch Rates	1.0	5
	Partnership Gill Net Index Catch Rates	1.0	5
2	Commercial Gill Net Effort	0.8	1
	Sport Effort	0.8	1
	Commercial Trap Net Effort	0.6	1
	Commercial Gill Net Harvest	1.0	5
	Sport Harvest	0.9	5
	Commercial Trap Net Harvest	0.7	5
	Trawl Survey Catch Rates	0.9	5
	Partnership Gill Net Index Catch Rates	1.0	5
3	Commercial Gill Net Effort	0.8	1
	Sport Effort	0.8	1
	Commercial Trap Net Effort	0.6	1
	Commercial Gill Net Harvest	1.0	5
	Sport Harvest	0.8	5
	Commercial Trap Net Harvest	0.6	5
	Trawl Survey Catch Rates	1.0	5
	Partnership Gill Net Index Catch Rates	1.0	5
4	Commercial Gill Net Effort	0.8	1
	Sport Effort	0.7	1
	Commercial Trap Net Effort	0.6	1
	Commercial Gill Net Harvest	1.0	5
	Sport Harvest	0.7	5
	Commercial Trap Net Harvest	0.6	5
	NY Gill Net Survey Catch Rates	1.0	5
	Partnership Gill Net Index Catch Rates	0.9	5

Appendix Table 2. Surveys selected by multi-model inference (MMI) age-2 recruitment

MU	Survey	Parameter Estimate	Number of Models
MU1	OOS10	0.046	1
	OHF10	0.092	1
	OOS11	0.707	3
	(Intercept)	13.718	3
MU2	OHF21	0.037	1
	OHF20	0.269	2
	OPSF21	0.300	2
	(Intercept)	14.806	2
MU3	OHJ31A	0.266	1
	OPSF31	0.311	1
	(Intercept)	14.888	1
MU4	NYGN41	-0.034	1
	NYF41	0.474	2
	LPC41	0.131	2
	(Intercept)	13.345	2

Appendix Table 3. Interagency trawl surveys indices. All trawl series are reported in arithmetic mean catch per hectare, all gill net series are in numbers of fish per lift.

Year	OHF10	OHF11	OOS10	OOS11	OHF20B	OHF21B	OHF30B	OHF31B	OHJ21B	OHJ31B	NYF40	NYF41	NYGN41	LPC40	LPC41	OPSF11	OPSF21	OPSF31	OPSF41
1988	.	.	212.6	13.3	.	.	.	.	.	.	.	.	.	105.8	0.4	.	.	.	.
1989	.	.	265.4	12.5	.	.	.	.	.	.	.	.	.	82.1	16.4	.	.	6.8	76.6
1990	310.1	0.0	259.2	35.2	52.2	23.0	21.2	12.4	.	.	.	.	.	26.7	5.6	41.3	68.9	29.7	0.6
1991	58.1	0.4	113.3	42.1	9.3	50.0	1.2	19.7	216.5	19.7	.	.	.	17.8	3.2	63.3	56.6	3.8	1.6
1992	90.9	0.7	94.2	16.5	36.3	15.0	31.3	3.3	18.5	0.8	10.7	2.4	.	70.3	4.6	47.5	8.0	5.7	6.3
1993	256.4	3.7	862.5	39.5	10.6	49.0	27.3	12.1	9.7	5.8	113.0	3.1	0.2	30.6	2.6	146.9	112.0	93.2	0.1
1994	287.1	73.1	469.7	62.9	71.9	12.0	16.1	3.4	23.3	10.2	49.0	8.6	0.6	34.7	6.2	317.8	22.5	39.7	7.4
1995	82.4	0.1	478.8	113.5	2.8	73.5	14.1	27.5	.	.	5.9	13.6	0.6	4.3	10.9	362.5	81.3	55.2	9.6
1996	579.3	82.3	2544.9	122.8	129.6	13.2	116.5	3.5	8.9	0.9	105.8	0.3	0.1	33.6	1.1	198.4	70.8	.	.
1997	33.7	104.9	55.2	93.8	11.6	147.3	2.6	40.0	493.9	64.0	0.2	5.7	0.0	4.4	7.1	139.3	350.5	177.9	.
1998	250.9	16.0	170.6	8.2	72.6	6.0	38.1	3.7	21.5	16.2	1.3	0.4	0.0	127.8	1.7	17.5	6.7	6.2	0.0
1999	155.3	47.1	330.0	75.0	68.3	41.8	25.7	41.7	402.8	97.3	35.9	33.3	13.1	16.1	110.0	440.6	107.6	67.9	119.9
2000	41.5	38.0	102.5	113.6	18.2	56.9	1.6	19.4	51.4	10.2	23.9	7.0	3.3	3.6	11.3	106.1	162.4	55.5	36.9
2001	246.3	10.3	398.4	11.3	119.2	5.3	13.6	0.4	279.8	4.3	100.4	11.7	2.2	69.4	2.0	12.9	9.6	1.9	9.5
2002	30.4	86.5	26.4	59.5	3.3	46.1	3.0	51.9	239.6	37.7	9.5	16.0	0.9	1.0	6.6	198.7	245.2	186.6	19.7
2003	1111.6	7.1	1620.8	12.3	136.9	2.9	53.2	1.0	9.5	2.5	484.8	2.0	2.0	222.8	2.3	2.7	2.6	7.2	3.2
2004	9.3	127.7	45.2	240.7	7.7	224.2	1.9	45.2	410.3	42.7	1.5	29.4	2.9	0.1	12.4	976.2	1187.6	332.5	7.6
2005	62.3	2.0	114.8	5.2	43.9	19.2	156.2	132.3	51.2	19.3	59.3	5.6	0.4	124.4	0.1	0.0	2.2	2.5	0.2
2006	121.9	12.5	222.9	12.4	11.3	4.3	18.9	12.5	29.7	113.6	290.6	40.9	32.6	30.1	12.1	15.7	28.5	94.8	129.7
2007	631.5	23.6	444.6	18.8	151.0	20.7	177.8	37.0	287.6	281.8	412.0	42.3	16.1	63.5	7.9	184.4	203.9	202.5	43.4
2008	74.7	15.3	387.2	142.1	32.1	55.0	52.8	26.4	303.5	97.2	1116.7	45.5	16.4	279.4	20.8	333.1	310.6	150.6	87.0
2009	69.4	57.0	136.6	88.4	1.6	20.2	0.5	139.4	125.9	48.2	11.9	64.1	42.4	0.4	10.7	265.2	121.4	190.0	30.6
2010	26.9	17.8	96.9	26.4	41.1	11.9	96.3	12.4	29.2	12.1	197.7	4.2	1.6	51.8	0.2	49.5	18.1	36.2	15.7
2011	12.0	10.0	178.0	25.9	10.3	6.3	15.1	55.5	70.8	41.7	89.5	141.8	105.9	176.7	2.6	158.7	101.8	218.6	95.4
2012	35.0	6.0	68.2	4.0	69.2	7.4	134.4	23.3	42.5	76.5	280.0	16.7	8.0	27.4	2.0	53.1	21.9	48.7	117.8
2013	337.0	3.7	315.6	17.8	8.9	34.9	8.9	109.5	84.2	116.2	4.4	24.4	16.0	0.5	0.8	64.1	71.4	152.1	30.4
2014	521.7	17.8	859.6	51.1	37.7	15.4	49.1	24.2	.	.	274.2	2.9	0.9	28.4	0.02	315.0	34.7	16.4	2.2
2015	224.0	53.0	494.3	117.2	19.6	41.3	18.6	30.2	.	.	68.6	57.3	2.0	58.5	1.6	424.3	66.5	212.7	170.9
2016	146.8	22.9	404.1	33.2	0.5	5.0	1.6	8.7	46.5	149.4	2178.2	53.0	10.4	360.6	91.7	105.6	50.4	35.1	298.2
2017	125.5	1.0	493.7	4.4	19.0	3.7	39.1	7.6	7.2	17.6	247.0	129.5	77.4	65.5	4.4	90.3	65.3	104.8	414.1
2018	429.6	17.4	959.3	21.6	28.4	7.9	50.8	6.6	14.9	50.4	662.4	11.4	1.7	328.8	2.9	78.5	28.3	130.2	23.3
2019	161.1	69.8	518.7	95.1	0.2	4.5	6.8	7.4	26.2	22.3	169.1	2.5	0.9	227.0	18.9	332.0	42.5	23.7	26.2
2020	99.9	14.2	566.4	22.7	5.7	4.9	3.9	0.6	.	.	91.6	56.2	17.2	73.7	21.1	93.5	31.7	87.5	314.3
2021	.	.	1358.0	36.7	13.0	13.0	2.2	4.8	13.9	3.7	284.2	33.5	15.3	14.0	8.1	145.9	27.7	96.3	252.2
2022	148.8	40.1	571.5	102.1	3.0	4.8	2.7	2.8	78.2	17.6	297.1	26.8	24.1	40.5	1.6	345.1	33.7	15.0	144.7
2023	151.5	20.5	381.4	41.0	12.9	4.7	3.0	4.5	7.8	4.6	34.5	40.9	4.8	15.8	4.1	84.5	22.9	25.1	16.0
2024	109.9	11.0	673.1	27.4	52.5	5.6	10.8	6.0	12.9	47.4	71.2	10.9	6.9	6.8	2.8	94.0	14.5	125.1	62.6

Appendix Table 4. Lakewide recruitment index codes and series names used in Appendix Tables 2 and 3. All series are reported in arithmetic mean catch per hectare, except LPS41, NYGN41, and OPSF11-41, gill net indices which are reported in mean catch per lift. Abbreviations in Appendix Table 3 ending with a 'B' represent survey indices blocked by depth strata.

Abbreviation	Series
OHF10	Ohio Management Unit 1 fall age 0
OHF11	Ohio Management Unit 1 fall age 1
OOS10	Ontario/Ohio Management Unit 1 summer age 0
OOS11	Ontario/Ohio Management Unit 1 summer age 1
OHF20	Ohio Management Unit 2 fall age 0
OHF21	Ohio Management Unit 2 fall age 1
OHF30	Ohio Management Unit 3 fall age 0
OHF31	Ohio Management Unit 3 fall age 1
OHJ21	Ohio Management Unit 2 June age 1
OHJ31	Ohio Management Unit 3 June age 1
LPC40	Long Point Composite Management Unit 4 age 0
LPC41	Long Point Composite Management Unit 4 age 1
NYF40	New York Management Unit 4 fall trawl age 0
NYF41	New York Management Unit 4 fall trawl age 1
NYGN41	New York Management Unit 4 gill net age 1
OPSF11	Ontario Partnership Gill Net Management Unit 1 fall age 1
OPSF21	Ontario Partnership Gill Net Management Unit 2 fall age 1
OPSF31	Ontario Partnership Gill Net Management Unit 3 fall age 1
OPSF41	Ontario Partnership Gill Net Management Unit 4 fall age 1