

STUDY PERFORMANCE REPORT

State: Michigan

Project No.: F-81-R-5

Study No.: 230695

Title: Northern Lake Huron, coolwater fish community assessment.

Period Covered: October 1, 2003 to September 30, 2004

Study Objective: To collect relative abundance, growth rate, and other biological data with which to assess responses of the Les Cheneaux Islands region and the St. Marys River coolwater fish communities to exploitation, management initiatives, and changing environmental and biological conditions.

Summary: In the Les Cheneaux Islands, survey work was completed on schedule. Yellow perch abundance as indicated by gillnet mean CPUE continued to decline for the fourth straight year. The yellow perch catch in Hessel Bay was very low in 2003 and 2004. The decline was principally driven by a lower yellow perch catch in Muskellunge Bay. Total annual mortality rate of perch was 57% in 2003 and growth rate of yellow perch has remained fast, consistent with the hypothesis that the overall population is depressed as further evidenced by declines in the sport fishery. Electrofishing was continued in 2003 and 2004 to further develop an index of yellow perch recruitment (based on age-0 fish). The catch per unit of effort of age-0 yellow perch has also continued to decline. It now appears that the yellow perch population may be experiencing both poor recruitment as well as a relatively high mortality rate. Comparison netting in August (for comparing to the traditional October timing of this survey) was performed and there was no overall significant difference in mean yellow perch CPUE, however, additional analysis for other species and an additional year of comparison netting will be necessary before a decision about future survey timing can be made.

Findings: Jobs 1 through 4 were scheduled for 2003-04, and progress is reported below.

Job 1. Title: Fish Community Survey of the St. Marys River.—This job is complete. The final report can be viewed and downloaded from: <http://www.glfc.org/lakecom/lhc/SMR2002rpt.pdf>. The report was published as a miscellaneous publication by the Great Lakes Fishery Commission (GLFC) because the project was conducted jointly with the other member agencies of the St. Marys River Fisheries Task Group, which is part of the Lake Huron Technical Committee, GLFC.

Job 2. Title: Fish community survey of the Les Cheneaux Islands region of Lake Huron.—In 2003, the gillnet surveys collected a total of 1,922 specimens, 1,200 during the August survey representing 18 species and another 722 during the October survey representing 16 species. In the August portion of the 2004 survey, 687 specimens were collected representing 16 species. Survey differences will be discussed more directly in Job 3 of this performance report. Unless otherwise noted, this discussion pertains to the traditional October survey findings. Gillnet sampling in 2003/04 included the fixed-annual survey stations of Hessel Bay, Muskellunge Bay and Government Bay. The summer exploratory set for 2004 was in Moscoe Channel (Figure 1).

Catch per unit effort (CPUE) of yellow perch (See Table 1 for a complete listing of all the common and scientific names of fish mentioned in this report) continued to decline for the fourth straight year (Table 2). Declines were driven by a declining yellow perch CPUE in Muskellunge

Bay, which has recently accounted for the majority of the catch (Figure 2). Few yellow perch were collected from Hessel Bay, which historically was a major source of perch to this survey and the local fishery. Government Bay's contribution of yellow perch to the survey mean CPUE remains largely unchanged (Figure 2). Clearly, the yellow perch population in the Les Cheneaux Islands remains depressed. A cormorant control project was initiated in 2004 in the Les Cheneaux Islands area by the U.S. Department of Agriculture's Wildlife Services Unit (Michigan office). Their intent is to reduce the local cormorant population by approximately 80% through egg oiling and adult culling with the objective of reducing predation on yellow perch and other species. If the control effort is successful, this Federal Aid study may be able to measure a response in the yellow perch population such as increasing density, lower total annual mortality rate, changes in growth. Population level responses would not be anticipated until next year at the earliest.

Mean age of yellow perch in the Les Cheneaux Islands has declined compared to 1997 and 1998 (Table 3). The age structure has become compressed with no perch older than age-4 present in the sample. The CPUE of age-2 yellow perch serves as one means to assess trends in recruitment in the perch population. Age-2 yellow perch (2001 year class) CPUE was the lowest level in 2003 since 1998 (Figure 3, Table 3). The compression of the age structure is consistent with past observations that the perch population is subject to a high total annual mortality rate, which is at least partially tied to cormorant predation (Fielder 2004). Based on this age structure, total annual mortality rate in 2003 was 57% (Robson-Chapman method; Van Den Avyle and Haywood 1999), a relatively high rate in the absence of a significant sport fishery (Figure 4).

Yellow perch growth rate as indicated by mean length at age continued to exceed that state average rate (Table 4) and represented a continuation of improvement over past years (Figure 5). Fast growth of yellow perch is consistent with the lower density as measured by the gillnet CPUE. Diet of yellow perch in 2003 appeared to be more diversified than that measured in 2002, but was still dominated by crayfish (Table 5). In 2003, both male and female yellow perch were consistently achieving 100% sexual maturity by about 21 cm in total length (Table 6).

Other species of notable abundance in the Les Cheneaux Islands collection in 2003 and August of 2004 included rock bass, white sucker, lake herring, brown bullhead, northern pike, and alewives. Menominee is becoming a more common species in these collections since 2001. Northern pike are generally lower in abundance since 2001 but are otherwise steady in their numbers. Walleye continue to be a relatively uncommon fish community member in the Les Cheneaux Islands. Likely, a lack of nearby tributary spawning habitat prevents this species from achieving a prominent place. Round goby still has not been collected in this survey but reports of gobies from Hessel Bay anglers have been wide spread since 2003 and are likely present.

Electrofishing to index yellow perch recruitment again took place in August of 2004 (Table 7). Electrofishing has become an element of this survey in an attempt to develop another index of yellow perch recruitment that is sensitive to earlier life stages than the mean gillnet CPUE of age-2 perch previously described. Each unit of effort at each station was 30 minutes or 1,800 seconds of generator time across five stations (Table 7). Recruitment appears to be declining since 2001 (Table 8). It is not clear why perch reproduction, as expressed as late summer CPE of age-0 perch, is declining, especially given that 2003 was a record year for yellow perch reproduction in some other parts of the Great Lakes (See Michigan Federal Aid Study 466). It may be that mature spawning-age perch are becoming rare enough in much of the Les Cheneaux Islands that production is now brood-stock limited. Other explanations are that the regional recruitment-failure phenomenon that has plagued much of the rest of the Great Lakes is finally affecting the Les Cheneaux Islands.

Job 3. Title: Comparison netting of the Les Cheneaux Islands region and calculation of correction factors.—Gillnetting was performed in August 2003 and August 2004 for comparing with the catch in gillnets during the traditional survey in October. The intent is to determine if the survey could be conducted in August instead of October. To accomplish this, the August survey would have to: (1) produce CPUE values of either no difference to the October survey or be correctable to maintain comparability to past October survey data (which dates back to 1969); (2) key species would have to be vulnerable to the survey gear in August; and (3) be acceptable to the public.

Statistical comparison of the survey catch between months has been limited to yellow perch to date. Analysis will be expanded to other species for the final report. There was no significant difference for mean yellow perch CPUE between months for 2003 as determined by Independent Samples T-tests performed at the significance level of $P < 0.05$ (Table 9). Similarly, when all three years, 2001-2003, are examined by location, most CPUEs were not significant except for Government Bay in 2002 where the fall (October) mean CPUE was significantly greater than the summer (August) mean CPUE. October netting will continue in 2004 and compared before a final decision is made with regards how future survey work may be scheduled (August or October). On the whole, the variance and confidence intervals were large for these samples and the sample size (especially within locations) was low. This, combined with inherent variability of catch with gillnets may have masked differences between sampling seasons. So far, a clear pattern of any disproportionate catch between months has not been evident.

Job 4. Title: Write performance report.—This Annual Performance Report was prepared on schedule. In addition, the final report for Job 1 is complete and available for download from: <http://www.glfco.org/lakecom/lhc/SMR2002rpt.pdf>.

Literature Cited:

- Fielder, D. G. 2004. Collapse of the yellow perch fishery in the Les Cheneaux Islands, Lake Huron, and possible causes. Pages 129-130 in *Proceedings of the Percis III; The Third International Percid Fish Symposium*, T. P. Barry, and J. A. Malison, *editors*. University of Wisconsin Sea Grant Institute. Madison.
- Schneider, J. C., P. W. Laarman, and H. Gowing. 2000. Age and growth methods and state averages. Chapter 9 in J. Schneider, editor. *Manual of fisheries survey methods II: with periodic updates*. Michigan Department of Natural Resources, Fisheries Special Report 25, Ann Arbor.
- Van Den Avyle, M. V., and R. S. Hayward. 1999. Dynamics of exploited fish populations. Pages 127-166 in C. C. Kohler and W. A. Hubert, editors. *Inland fisheries management in North America*, 2nd edition. American Fisheries Society, Bethesda, Maryland.

Prepared by: David Fielder

Date: September 30, 2004

Table 1.–Common and scientific names of fishes and other aquatic organisms mentioned in this report.

Common name	Scientific name
Alewife	<i>Alosa pseudoharengus</i>
Black crappie	<i>Pomoxis nigromaculatus</i>
Bloater	<i>Coregonus hoyi</i>
Bowfin	<i>Amia calva</i>
Brook trout	<i>Salvelinus fontinalis</i>
Brown bullhead	<i>Ameiurus nebulosus</i>
Brown trout	<i>Salmo trutta</i>
Burbot	<i>Lota lota</i>
Carp	<i>Cyprinus carpio</i>
Channel catfish	<i>Ictalurus punctatus</i>
Chinook salmon	<i>Oncorhynchus tshawytscha</i>
Coho salmon	<i>Oncorhynchus kisutch</i>
Freshwater drum	<i>Aplodinotus grunniens</i>
Gizzard shad	<i>Dorosoma cepedianum</i>
Lake herring	<i>Coregonus artedi</i>
Lake trout	<i>Salvelinus namaycush</i>
Lake whitefish	<i>Coregonus clupeaformis</i>
Longnose dace	<i>Rhinichthys cataractae</i>
Longnose gar	<i>Lepisosteus osseus</i>
Longnose sucker	<i>Catostomus catostomus</i>
Menominee	<i>Prosopium cylindraceum</i>
Muskellunge	<i>Esox masquinongy</i>
Northern pike	<i>Esox lucius</i>
Pink salmon	<i>Oncorhynchus gorbuscha</i>
Rainbow smelt	<i>Osmerus mordax</i>
Rainbow trout	<i>Oncorhynchus mykiss</i>
Redhorse spp.	<i>Moxostoma</i> spp.
Rock bass	<i>Ambloplites rupestris</i>
Round goby	<i>Neogobius melanostomus</i>
Sculpin	<i>Cottus bairdi</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
Splake	<i>S. fontinalis</i> x <i>S. namaycush</i>
Spottail shiner	<i>Notropis hudsonius</i>
Stickleback spp.	<i>Pungitius</i> or <i>Gasterosteus</i> spp.
Sunfish spp.	<i>Lepomis</i> spp.
Trout-perch	<i>Percopsis omiscomaycus</i>
Walleye	<i>Sander vitreus</i> formerly <i>Stizostedion vitreum</i>
White perch	<i>Morone americana</i>
White sucker	<i>Catostomus commersoni</i>
Yellow perch	<i>Perca flavescens</i>

Table 2.—Catch per unit of effort and total effort from traditional netting locations in the Les Cheneaux Islands, 1993 through 2004. All data are from October unless otherwise noted.

Species	1993	1994	1995	1996	1997	1998	1999	2000	Aug 2001	2001	Aug 2002	2002	Aug 2003	2003	Aug 2004
Total effort (in ft. of net)	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
Net lifts	3	6	3	3	1	3	6	6	6	6	6	6	6	6	6
Alewife	0.7	1.3	0.0	1.7	0.0	1.2	0.2	1.2	0.83	0.5	14.5	12.0	9.5	29.2	2.7
Black bullhead	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Black crappie	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bowfin	0.3	0.7	0.0	2.3	0.3	0.0	0.0	0.2	0.3	0.2	0.0	0.2	0.2	0.0	0.2
Brown bullhead	3.0	1.0	7.2	32.8	2.5	3.2	10.7	6.3	13.7	6.8	103.5	24.5	59.5	38.2	37.5
Brown trout	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Burbot	0.5	0.0	0.0	0.3	0.0	1.0	0.0	0.3	0.3	0.0	0.3	0.0	0.2	0.0	0.0
Carp	0.5	1.2	0.0	1.3	0.2	1.0	0.3	0.0	0.0	0.2	0.2	0.2	0.0	0.2	0.0
Channel catfish	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chinook salmon	0.2	0.0	0.0	0.7	0.2	0.2	0.2	0.3	0.2	0.0	0.5	0.7	0.0	0.5	0.2
Coho salmon	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Freshwater drum	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Gizzard shad	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.0	0.3	0.7	0.0	0.0
Lake herring	5.2	3.2	1.3	1.7	0.2	0.3	9.0	0.2	8.3	1.3	4.3	2.8	1.0	8.8	0.7
Lake trout	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.8	0.0
Lake whitefish	0.0	0.0	0.0	0.3	0.8	1.0	2.8	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Largemouth bass	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Longnose dace	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Longnose gar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Longnose sucker	0.0	0.2	0.0	0.3	0.0	0.0	0.0	0.0	4.0	0.0	0.0	0.0	0.2	0.0	0.0

Table 2.—Continued.

Species	1993	1994	1995	1996	1997	1998	1999	2000	Aug 2001	2001	Aug 2002	2002	Aug 2003	2003	Aug 2004
Menominee	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.5	0.8	0.5	1.2	0.3	1.5	2.5
Muskellunge	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern pike	13.8	11.0	9.2	15.5	10.0	15.3	16.7	8.2	0.8	4.7	1.8	8.5	1.5	8.3	3.0
Rainbow smelt	0.0	0.0	0.0	0.3	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.0
Rainbow trout	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Redhorse spp.	0.0	0.5	2.2	0.7	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rock bass	2.0	10.3	12.8	15.7	10.5	8.2	44.3	11.0	14.3	11.7	15.5	21.5	40.0	3.2	13.5
Smallmouth bass	0.0	0.0	0.2	0.0	0.0	0.3	0.7	0.7	2.2	0.7	1.0	1.0	3.3	0.2	0.2
Splake	0.7	0.0	2.5	1.2	2.3	2.0	0.7	0.2	0.0	0.0	0.0	0.3	0.0	0.5	0.7
Spottail shiner	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Sunfish spp.	0.0	0.0	0.0	0.3	0.2	0.0	0.2	3.0	0.3	2.8	0.0	0.0	0.7	0.0	0.2
Walleye	0.2	0.3	0.2	1.0	0.7	1.7	0.5	0.7	0.0	0.2	0.2	0.0	0.2	0.5	0.5
White perch	0.0	0.0	0.0	1.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.3	0.0	0.0	0.0
White sucker	9.2	26.8	6.2	9.8	5.2	2.3	13.5	8.3	10.2	8.7	3.5	32.5	34.3	14.0	22.0
Yellow perch	15.7	26.3	41.8	20.2	15.3	36.2	21.2	73.5	52.5	45.8	28.2	28.5	45.5	14.7	22.2

Table 3.—Yellow perch catch per unit effort (CPUE) by age, the Les Cheneaux Islands, 1998-2003, based on October gillnet catch.

Age	1997	1998	1999	2000	2001	2002	2003
0	—	—	—	—	0.33	0.17	—
1	—	0.67	1.50	1.5	20.50	17.00	0.67
2	1.50	7.67	28.00	28.00	3.83	4.83	3.17
3	1.83	13.50	29.67	29.67	11.67	5.50	9.33
4	5.67	5.33	8.83	2.17	6.67	0.67	0.83
5	2.50	2.67	3.67	0.17	2.17	0.17	—
6	2.50	2.17	0.83	—	0.17	—	—
7	1.33	1.33	0.17	—	—	—	—
8	0.17	1.33	0.17	—	—	—	—
9	0.17	0.5	0.17	—	—	—	—
10	—	0.33	—	—	—	—	—
11	—	0.17	—	—	—	—	—
Number aged	94	213	126	438	272	170	84
Total CPUE	15.67	35.5	21.00	73.00	45.33	28.30	14.17
Mean age	4.52	3.75	2.88	2.87	2.24	1.65	2.74

Table 4.—Mean length-at-age (in mm) for yellow perch from Les Cheneaux Islands, 2003, October collection, with the state average (Schneider et al. 2000) for comparison.

Age	Mean Length	Number	State average
0	—	—	—
1	—	—	133
2	178	19	165
3	250	56	191
4	261	5	216
5	—	—	240
6	—	—	262
7	—	—	282
8	—	—	295
9	—	—	307

Table 5.—Incidence of void stomachs and percent-occurrence of food items found in stomachs of yellow perch in Les Cheneaux Islands region, 2002 & 2003 (August and October data combined).

Parameter	2002	2003
	% Abundance	% Abundance
Void	67	60
Non-void	33	40
Food item		
Amphipods	—	3.2
Crayfish	92.7	69.1
Dipterians	0.4	—
Alewives	0.4	0.8
Sculpins	—	1.2
Sticklebacks	4.5	2.8
Mayflies	—	9.7
Smelt	—	0.8
Johnny darter	—	1.2
Zebra mussel	—	0.4
Largemouth bass	—	0.4
Others	2.0	8.1
Total	100.0	100.0

Table 6.—Percentage of yellow perch that were scored as sexually mature in the Les Cheneaux Islands region, 2003 (Aug. & Oct. combined) by length increment.

Length (cm)	Males		Females	
	Total No.	% Mature	Total No.	% Mature
13				
14	1	11.1		
15	4	12.5	2	10.5
16	4	19.0	2	8.7
17	5	50.0	2	22.2
18	8	72.7	1	33.3
19	2	100.0	10	83.3
20	6	85.7	7	87.5
21	2	100.0	5	100.0
22	3	100.0	14	100.0
23	11	100.0	21	100.0
24	4	100.0	18	100.0
25	1	100.0	27	100.0
26			21	100.0
27	1	100.0	10	90.9
28			6	100.0
29			4	100.0
30			3	100.0
31				

Table 7.—Sample location and effort (in seconds of generator time) yellow perch electrofishing recruitment index in the Les Cheneaux Islands, August 2001-04.

Location	Year			
	2001	2002	2003	2004
Hessel Bay	1,018	1,800	1,800	1,800
Muskellunge Bay	1,800	1,800	1,800	1,800
Government Bay	1,800	1,800	1,800	1,800
Cedarville Bay	1,800	1,800	1,800	1,800
Moscoe Channel	1,000	1,800	1,800	1,800
Mackinac Bay	—	1,800	—	—

Table 8.—Catch per unit of effort of yellow perch by age from electrofishing in the Les Cheneaux Islands 2001-03. One unit of effort equals 30 minutes of generator time.

Location	Year & Age							
	2001				2002			
	Age-0	Age-1	Age-2	Age-3	Age-0	Age-1	Age-2	Age-3
Hessel	4.0	3.0	6.0	3.0	0.0	2.0	0.0	0.0
Muskellunge	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Government	15.0	11.0	4.0	0.0	0.0	0.0	0.0	0.0
Cedarville	15.0	17.0	6.0	1.0	0.0	3.0	0.0	0.0
Moscoe	74.0	14.0	4.0	0.0	79.0	10.0	0.0	0.0
Mackinac	—	—	—	—	0.0	1.0	0.0	0.0
Mean	21.6	9.0	4.0	0.8	15.8	3.2	0.0	0.0
	2003				2004			
Hessel	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Muskellunge	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0
Government	1.0	16.0	70.0	1.0	0.0	0.0	0.0	0.0
Cedarville	0.0	5.0	11.0	1.0	0.0	0.0	1.0	3.0
Moscoe	1.0	97.0	11.0	1.0	0.0	1.0	15.0	1.0
Mackinac	—	—	—	—	—	—	—	—
Mean	0.4	23.6	18.4	0.6	0.0	0.2	4.6	1.0

Table 9.—Comparison of mean catch per unit effort of yellow perch in gillnets in the Les Cheneaux Islands for 2001, 2002, and 2003. Comparisons are within year between fall (F) sets made in October and summer (S) sets made in August, comparisons by specific sampling location and locations combined. Tests were Independent-samples T-test. Significance was determined at $P < 0.05$.

Location	Difference	P	Means
2001			
Muskellunge Bay	Not significant	0.22	F=115.5, S=154.5
Hessel Bay	Not significant	0.62	F=1.0, S=3.0
Government Bay	Not significant	0.28	F=21.0, S=0.0
Locations combined	Not significant	0.87	F=45.8, S=52.5
2002			
Muskellunge Bay	Not significant	0.76	F=68.0, S=84.5
Hessel Bay	Not significant	0.50	F=1.5, S=0.0
Government Bay	Significant	0.04	F=16.0, S=0.0
Locations combined	Not significant	0.99	F=28.5, S=28.2
2003			
Muskellunge Bay	Not significant	0.40	F=0.0, S=13.0
Hessel Bay	Not significant	0.45	F=26.0, S=93.5
Government Bay	Not significant	0.53	F=30.0, S=16.5
Locations combined	Not significant	0.19	F=14.2, S=45.5

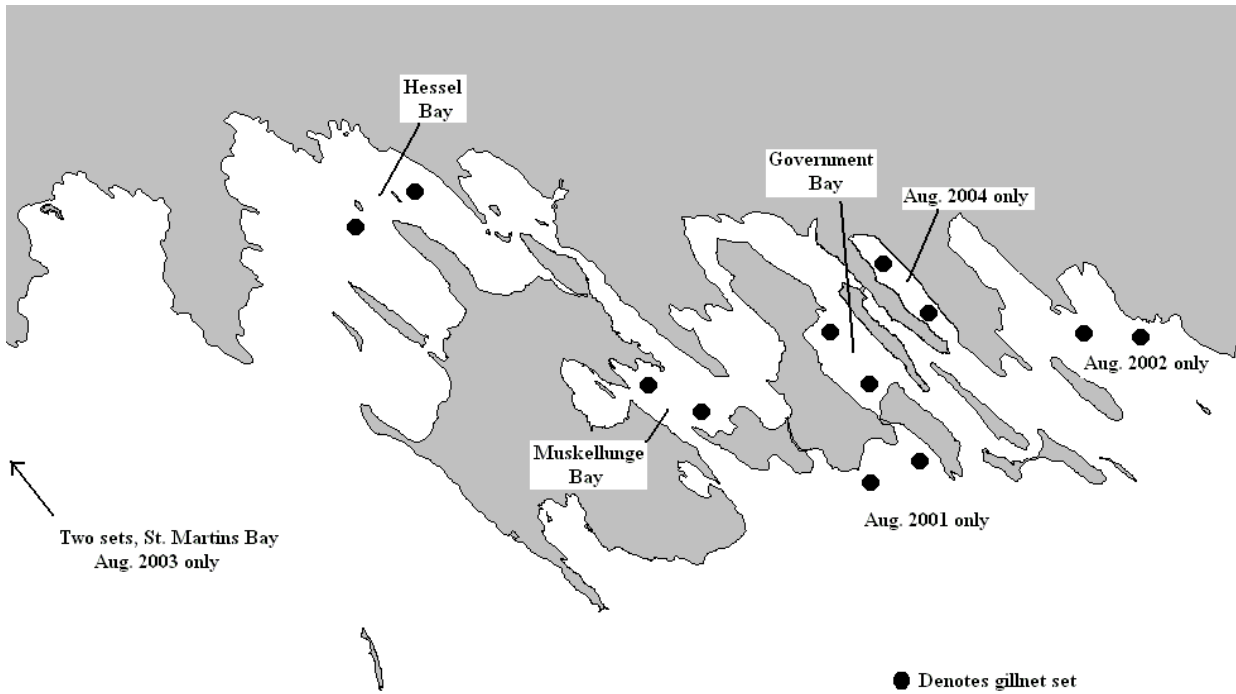


Figure 1.—Gillnet locations in the Les Cheneaux Islands region, set in 2001 through 2004.

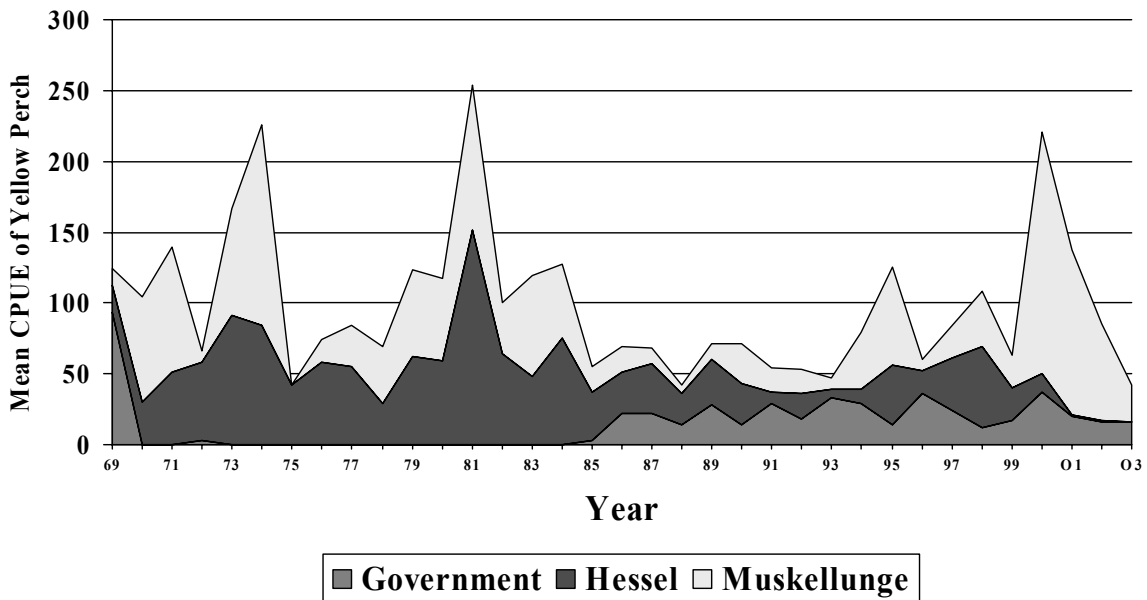


Figure 2.—Mean catch per unit of effort (CPUE) in gillnets of yellow perch in the Les Cheneaux Islands by sampling station 1969–2003 (October data only). Government Bay was not sampled 1970–1984. Muskellunge Bay was not sampled in 1975.

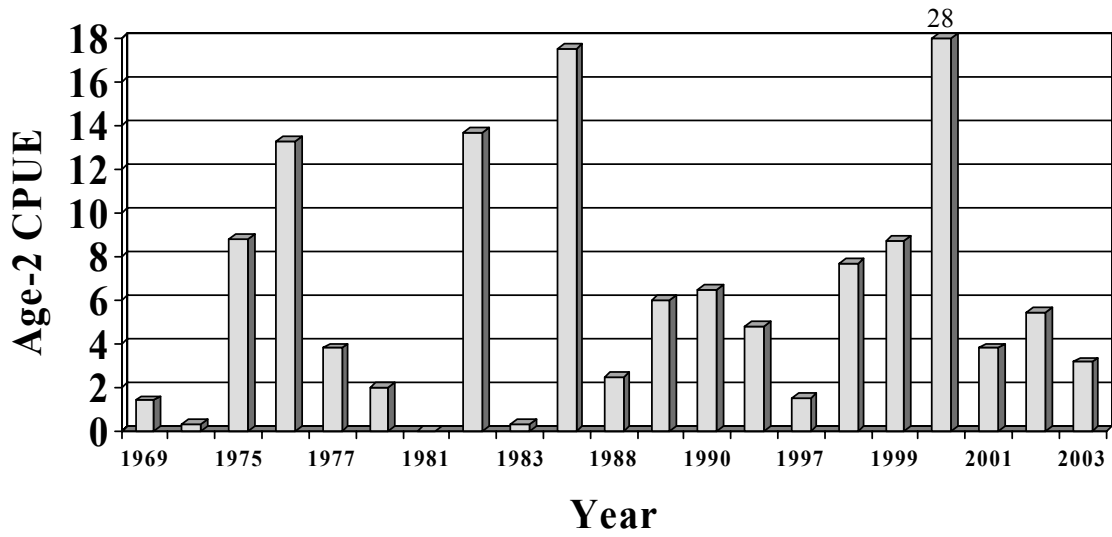


Figure 3.—Catch per unit effort (CPUE) of age-2 yellow perch in gillnets as an indicator of recruitment in the Les Cheneaux Islands, 1969 through 2003. All data are from October.

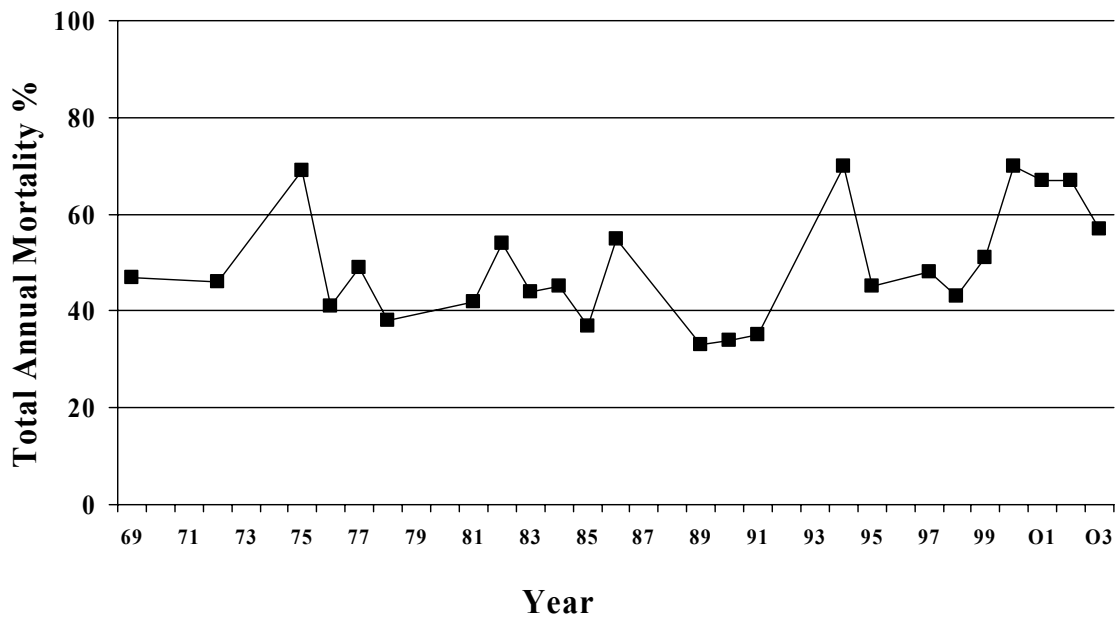


Figure 4.—Total annual mortality of yellow perch in the Les Cheneaux Islands from 1969 through 2003 gillnet catches. Calculated with Robson-Chapman Method.

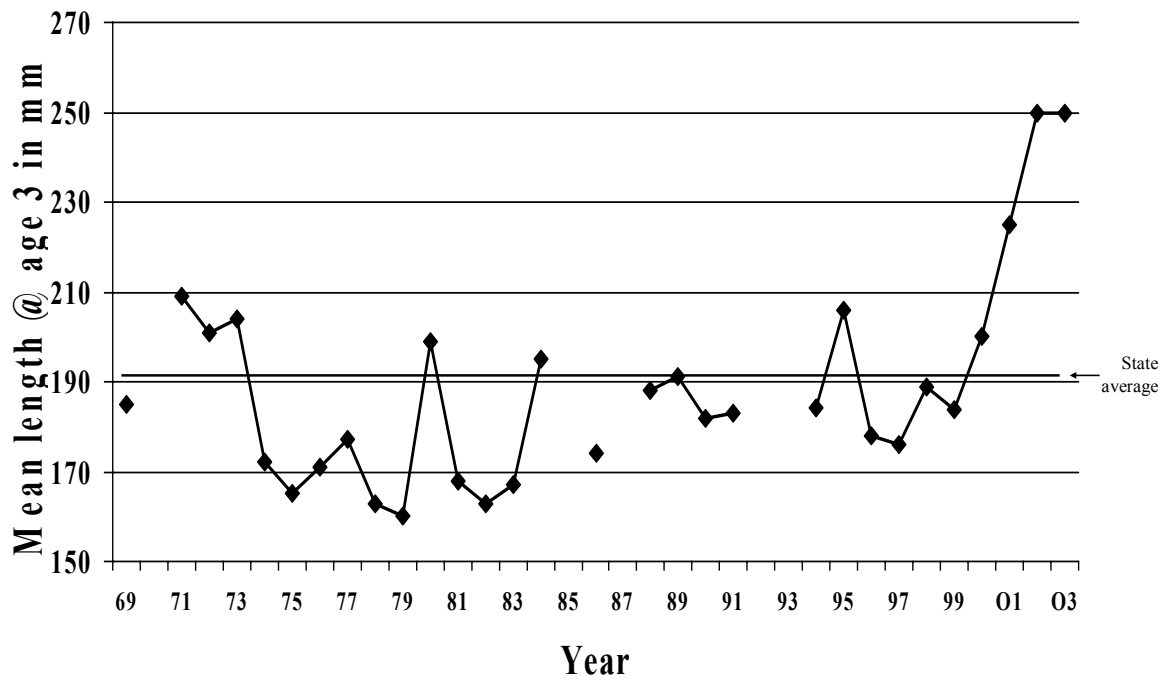


Figure 5.—Mean length at age-3 for yellow perch (sexes combined) for 1969 – 2003 from the Les Cheneaux Islands October gillnet catch. Michigan state average length at age-3 indicated for reference.