1997

# Lake Winona 1997 lake survey report

Cal R. Fremling
*Winona State University*

02/20/98

# *Minnesota Department of Natural Resources*
# *Section of Fisheries*

## *Lake Survey Report*

| | | | |
|---|---|---|---|
| Division of Waters inventory number: | 85-0011-00 | Starting date of survey: | 07/21/97 |
| Lake name: | WINONA | Alternate name: | N/A |
| Lake class number: | 38 | Alternate classes: | NA |
| Area-code: | 510 | Map ID: | B0424 |
| Survey-type: | Population assessment | | |

## *Lake Location Information*

| | | | | | |
|---|---|---|---|---|---|
| Counties: | Winona | | | Nearest town: | WINONA |
| Legal description: | Township - 107N; | Range - | 7W; | Sections - | 26, 27, 28, 35 |

## *Public Access*

| ID# | Ownership | Type | Location Description / Comments |
|---|---|---|---|
| AC- 1 | City | Concrete | Three boat ramps are maintained by the Winona Park Dept.;two on the NE shore of the SE basin, one on the N shore of the NW basin. |

## *Previous Surveys and Investigations*

| | |
|---|---|
| Initial Survey: | 1953; |
| Resurveys: | 1960; |
| Population assessments: | 1993;1991;1989;1988;1987;1986;1985;1984;1983;1982;1981;1980; |
| Creel surveys: | |
| Other kinds of survey: | 1996; |

## *Lake and Watershed Characteristics*

| | | | |
|---|---|---|---|
| Lake area (acres): | 319 | Shoreline length (mi): | 5.3 |
| Area in MN (acres): | 319 | Maximum fetch (mi): | 2.0 |
| DOW area (acres): | 318 | Fetch orientation: | N/A |
| Littoral acres: | 278 | Watershed size (acres): | N/A |
| Maximum depth (feet): | 38 | Major watershed number: | 40 |

Mean depth (feet): N/A Minor watershed number: N/A
Primary USGS Quad map code: B0424

## Current Water Level

| Date | Level | Station Code | Reading |
|---|---|---|---|

## The History of Water Levels

Data on water level history were not found

## Inlets

No current data found

## Outlets

No current data found

## Surrounding Watershed Characteristics

No current data found

## Shoreline Characteristics

No current data found

## Resorts / Campgrounds

| ID# | Name | Cabins | Campsites | Comments |
|---|---|---|---|---|

No current data found

## Aquatic Vegetation and Shoalwater Substrates

No data found

## Additional Species Found (outside Transects)

| Common Name | Comments |
|---|---|
| No data found | |

## Shoalwater Substrates

| Common Name | Frequency of Occurence (%) | Abundance Rating | Mean Abundance |
|---|---|---|---|
| No data found | | | |

## Fish Spawning Conditions

| Species Name | Spawning Habitat Rating | Comments |
|---|---|---|
| No data found | | |

## Erosion and Pollution

| Site Code | Source | Type | Extent |
|---|---|---|---|
| No data found | | | |

## Erosion and Pollution Description

| Site Code | Description / Location |
|---|---|
| No description of pollution found | |

## *Field Notes*

Dissolved oxygen conditions were precarious for the duration of the survey, particularly in the lower basin (SE). Because of this, historical placement sites for gillnets 3 and 4 could not be duplicated (see map). The upper (NW) basin seemed to have better overall oxygen content. This was reflected in the gillnets which captured good numbers of fish; particularly, several large northern pike.

Several oxygen profiles were taken during this survey and can be found with the raw field notes. Only three are reported (one in the upper and two in the lower basin) in the water quality section of this document.

## *Physical and Chemical Characteristics of Lake Water*

| Station ID | Sampling Date | Bottom Depth (ft) | Depth (ft) | Water Temperature (F) | Dissolved Oxygen (ppm) |
|---|---|---|---|---|---|
| WQ-1 | 7/21/1997 | 17.0 | 0.0 | 76.8 | 6.8 |
| | | | 5.0 | 75.2 | 4.9 |
| | | | 6.0 | 75.2 | 4.8 |
| | | | 7.0 | 75.2 | 4.7 |
| | | | 8.0 | 75.0 | 4.9 |
| | | | 9.0 | 75.0 | 4.9 |
| | | | 10.0 | 75.0 | 4.8 |
| | | | 11.0 | 75.0 | 4.7 |
| | | | 12.0 | 74.8 | 4.5 |
| | | | 13.0 | 74.8 | 4.6 |
| | | | 14.0 | 74.8 | 4.8 |
| | | | 15.0 | 74.3 | 4.1 |
| | | | 16.0 | 74.1 | 3.2 |
| | | | 17.0 | 74.1 | 0.2 |
| WQ-2 | 7/22/1997 | 35.0 | 0.0 | 76.6 | 2.1 |
| | | | 7.0 | 76.6 | 1.9 |
| | | | 10.0 | 76.6 | 2.1 |
| | | | 12.0 | 76.5 | 2.1 |
| | | | 15.0 | 76.5 | 2.1 |
| | | | 17.0 | 76.3 | 2.0 |
| | | | 18.0 | 76.3 | 1.9 |
| | | | 19.0 | 76.3 | 1.6 |
| | | | 20.0 | 76.1 | 1.3 |
| | | | 21.0 | 76.1 | 0.9 |
| | | | 22.0 | 75.2 | 0.7 |
| | | | 23.0 | 75.2 | 0.2 |
| | | | 24.0 | 71.4 | 0.1 |
| | | | 34.5 | 52.7 | 0.1 |

## Physical and Chemical Characteristics of Lake Water (continued)

| Station ID | Sampling Date | Bottom Depth (ft) | Depth (ft) | Water Temperature (F) | Dissolved Oxygen (ppm) |
|---|---|---|---|---|---|
| WQ-3 | 7/22/1997 | 35.0 | 0.0 | 77.0 | 7.1 |
| | | | 5.0 | 77.0 | 6.7 |
| | | | 6.0 | 77.0 | 6.7 |
| | | | 7.0 | 77.0 | 6.6 |
| | | | 8.0 | 77.0 | 6.5 |
| | | | 9.0 | 77.0 | 0.8 |

## Water Quality

| Station ID | Sample Date | Sample Depth | Secchi (ft) | pH | Alkalinity | Water Color | Color Cause |
|---|---|---|---|---|---|---|---|
| WQ-1 | 7/21/1997 | N/A | 3.8 | N/A | N/A | Green | |
| WQ-2 | 7/21/1997 | N/A | 3.8 | N/A | N/A | Green | |
| WQ-3 | 7/22/1997 | N/A | N/A | N/A | N/A | Green | |

## Fish Diseases and Parasites

| Species | Disease/ Parasites | # of Fish | Number Examined |
|---|---|---|---|
| | No data found | | |

## Sampling of Natural Reproduction - Boat Electrofishing

No data reported in ELECTROF.DBF

## Sampling of Natural Reproduction - 1/4 Inch Trapnets

No data reported in TESTNET.DBF

## Sampling of Natural Reproduction - Seining

Number of sein hauls: 5
First haul on: 09/04/97
Last haul on: 09/04/97
Sampling method: Standard sampling.

## Seining Catch

| Species | Total Number YOY | Number Age >1 | Number YOY Measured | YOY Mean Length (in) | YOY Length Range (in) Minimum | Maximum |
|---|---|---|---|---|---|---|
| Bluegill | 2418 | 183 | 50 | 1.19 | 0.79 | 1.54 |
| Hybrid Sunfish | 0 | 8 | 0 | | | |
| Largemouth Bass | 5 | 1 | 5 | 3.33 | 2.36 | 3.82 |
| Pumpkinseed Sunfish | 0 | 4 | 0 | | | |

## Gillnetting Catch Summary

Number of sets: 6
First net set on: 07/21/97
Last net lifted on: 07/25/97
Sampling method: Standard sampling

## Summary by Numbers

| Species | Total Fish | Number per Set | Quartiles for Lake Class 25% | 50% | 75% |
|---|---|---|---|---|---|
| Black Bullhead | 23 | 3.8 | 7.7 | 56.2 | 104.7 |
| Black Crappie | 21 | 3.5 | 1.7 | 9.6 | 17.5 |
| Bluegill | 88 | 14.7 | N/A | N/A | N/A |
| Bowfin (Dogfish) | 1 | 0.2 | 0.3 | 0.8 | 1.3 |
| Brown Bullhead | 2 | 0.3 | 0.8 | 3.9 | 7.0 |
| Common Carp | 1 | 0.2 | 0.8 | 2.5 | 4.3 |
| Gizzard Shad | 10 | 1.7 | N/A | N/A | N/A |
| Golden Shiner | 1 | 0.2 | 0.6 | 1.7 | 2.8 |
| Hybrid Sunfish | 1 | 0.2 | N/A | N/A | N/A |
| Largemouth Bass | 2 | 0.3 | 0.3 | 0.4 | 0.6 |
| Northern Pike | 33 | 5.5 | 2.0 | 6.4 | 10.8 |
| Pumpkinseed Sunfish | 9 | 1.5 | N/A | N/A | N/A |
| Walleye | 9 | 1.5 | 0.8 | 2.3 | 3.8 |
| Warmouth | 7 | 1.2 | N/A | N/A | N/A |
| White Crappie | 1 | 0.2 | 0.5 | 6.8 | 13.0 |
| Yellow Bullhead | 3 | 0.5 | 0.5 | 2.8 | 5.0 |
| Yellow Perch | 59 | 9.8 | 2.0 | 12.1 | 22.3 |
| Total fish/set: | | 45.2 | | | |

## Summary by Weight (lbs)

| Species | Total Fish | Lbs per Set | Mean Weight | Quartiles for Lake Class 25% | 50% | 75% |
|---|---|---|---|---|---|---|
| Black Bullhead | 23 | 2.3 | 0.6 | 0.2 | 0.3 | 0.5 |
| Black Crappie | 21 | 1.4 | 0.4 | 0.1 | 0.2 | 0.3 |
| Bluegill | 88 | 1.9 | 0.1 | N/A | N/A | N/A |
| Bowfin (Dogfish) | 1 | 1.3 | 7.6 | 2.0 | 3.2 | 4.4 |
| Brown Bullhead | 2 | 0.4 | 1.1 | 0.3 | 0.5 | 0.8 |
| Common Carp | 1 | 0.7 | 4.5 | 1.0 | 2.5 | 4.0 |
| Gizzard Shad | 10 | 2.1 | 1.3 | N/A | N/A | N/A |
| Golden Shiner | 1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.2 |
| Hybrid Sunfish | 1 | 0.0 | 0.1 | N/A | N/A | N/A |
| Largemouth Bass | 2 | 0.0 | 0.1 | 0.5 | 1.0 | 1.5 |
| Northern Pike | 33 | 24.9 | 4.5 | 1.7 | 2.4 | 3.1 |
| Pumpkinseed Sunfish | 9 | 0.2 | 0.1 | N/A | N/A | N/A |
| Walleye | 9 | 5.3 | 3.6 | 1.4 | 2.2 | 3.0 |
| Warmouth | 7 | 0.1 | 0.1 | N/A | N/A | N/A |
| White Crappie | 1 | 0.1 | 0.8 | 0.1 | 0.2 | 0.3 |
| Yellow Bullhead | 3 | 0.3 | 0.5 | 0.4 | 0.6 | 0.8 |
| Yellow Perch | 59 | 1.4 | 0.1 | 0.1 | 0.1 | 0.2 |
| | Total lbs/set: | 42.4 | | | | |

## Historical Gillnetting Catch Summary

| Survey Date | Number of Nets | Species | Fish Caught | Number per Set | Lbs. per Set | Mean Weight (lbs) |
|---|---|---|---|---|---|---|
| 7/15/1991 | 5 | Yellow Perch | 10 | 2.0 | 0.4 | 0.2 |
| | 5 | White Sucker | 4 | 0.8 | 1.6 | 2.0 |
| | 5 | White Crappie | 1 | 0.2 | 0.3 | 1.6 |
| | 5 | White Bass | 1 | 0.2 | 0.5 | 2.6 |
| | 5 | Warmouth | 8 | 1.6 | 0.1 | 0.1 |
| | 5 | Walleye | 4 | 0.8 | 0.9 | 1.1 |
| | 5 | Pumpkinseed Sunfish | 13 | 2.6 | 0.5 | 0.2 |
| | 5 | Northern Pike | 9 | 1.8 | 6.4 | 3.5 |
| | 5 | Hybrid Sunfish | 2 | 0.4 | 0.1 | 0.2 |
| | 5 | Golden Shiner | 1 | 0.2 | 0.1 | 0.3 |
| | 5 | Brown Bullhead | 1 | 0.2 | 0.2 | 0.8 |
| | 5 | Bowfin (Dogfish) | 3 | 0.6 | 3.8 | 6.3 |
| | 5 | Bluegill | 111 | 22.2 | 2.4 | 0.1 |
| | 5 | Black Crappie | 35 | 7.0 | 1.5 | 0.2 |
| | 5 | Black Bullhead | 49 | 9.8 | 5.6 | 0.6 |

*Historical Gillnetting Catch Summary (continued)*

| Survey Date | Number of Nets | Species | Fish Caught | Number per Set | Lbs. per Set | Mean Weight (lbs) |
|---|---|---|---|---|---|---|
| 8/25/1989 | 5 | Yellow Perch | 29 | 5.8 | 0.5 | 0.1 |
| | 5 | Warmouth | 5 | 1.0 | 0.1 | 0.1 |
| | 5 | Walleye | 6 | 1.2 | 2.0 | 1.7 |
| | 5 | Sauger | 1 | 0.2 | 0.1 | 0.4 |
| | 5 | Pumpkinseed Sunfish | 12 | 2.4 | 0.2 | 0.1 |
| | 5 | Northern Pike | 21 | 4.2 | 8.7 | 2.1 |
| | 5 | Golden Shiner | 2 | 0.4 | 0.1 | 0.3 |
| | 5 | Bowfin (Dogfish) | 5 | 1.0 | 4.7 | 4.7 |
| | 5 | Bluegill | 206 | 41.2 | 3.0 | 0.1 |
| | 5 | Black Crappie | 242 | 48.4 | 6.2 | 0.1 |
| | 5 | Black Bullhead | 33 | 6.6 | 2.2 | 0.3 |
| 10/13/1988 | 5 | Yellow Perch | 11 | 2.2 | 0.2 | 0.1 |
| | 5 | Walleye | 6 | 1.2 | 0.5 | 0.4 |
| | 5 | Pumpkinseed Sunfish | 3 | 0.6 | 0.1 | 0.1 |
| | 5 | Northern Pike | 20 | 4.0 | 7.5 | 1.9 |
| | 5 | Largemouth Bass | 1 | 0.2 | 0.7 | 3.7 |
| | 5 | Common Carp | 1 | 0.2 | 3.1 | 15.4 |
| | 5 | Bowfin (Dogfish) | 5 | 1.0 | 4.1 | 4.1 |
| | 5 | Bluegill | 81 | 16.2 | 1.9 | 0.1 |
| | 5 | Black Crappie | 78 | 15.6 | 2.4 | 0.2 |
| | 5 | Black Bullhead | 19 | 3.8 | 1.2 | 0.3 |
| 7/28/1987 | 5 | White Sucker | 1 | 0.2 | 0.6 | 2.8 |
| | 5 | Northern Pike | 13 | 2.6 | 8.5 | 3.3 |
| | 5 | Bowfin (Dogfish) | 10 | 2.0 | 11.2 | 5.6 |
| 7/29/1986 | 5 | Yellow Perch | 20 | 4.0 | 0.5 | 0.1 |
| | 5 | White Sucker | 2 | 0.4 | 0.8 | 2.1 |
| | 5 | Warmouth | 1 | 0.2 | 0.0 | 0.2 |
| | 5 | Northern Pike | 23 | 4.6 | 10.6 | 2.3 |
| | 5 | Hybrid Sunfish | 1 | 0.2 | 0.0 | 0.1 |
| | 5 | Bowfin (Dogfish) | 12 | 2.4 | 10.6 | 4.4 |
| | 5 | Bluegill | 82 | 16.4 | 1.9 | 0.1 |
| | 5 | Black Crappie | 106 | 21.2 | 3.4 | 0.2 |
| | 5 | Black Bullhead | 34 | 6.8 | 5.8 | 0.8 |
| 7/30/1985 | 5 | Yellow Perch | 13 | 2.6 | 0.3 | 0.1 |
| | 5 | White Sucker | 1 | 0.2 | 0.4 | 2.2 |
| | 5 | Warmouth | 1 | 0.2 | 0.0 | 0.0 |
| | 5 | Walleye | 2 | 0.4 | 1.3 | 3.4 |
| | 5 | Northern Pike | 13 | 2.6 | 5.9 | 2.3 |
| | 5 | Bowfin (Dogfish) | 15 | 3.0 | 14.0 | 4.7 |
| | 5 | Bluegill | 206 | 41.2 | 4.5 | 0.1 |
| | 5 | Black Crappie | 230 | 46.0 | 7.4 | 0.2 |
| | 5 | Black Bullhead | 40 | 8.0 | 4.1 | 0.5 |
| 7/25/1984 | 5 | Yellow Perch | 142 | 28.4 | 2.9 | 0.1 |

*Historical Gillnetting Catch Summary (continued)*

| Survey Date | Number of Nets | Species | Fish Caught | Number per Set | Lbs. per Set | Mean Weight (lbs) |
|---|---|---|---|---|---|---|
| | 5 | White Sucker | 6 | 1.2 | 2.5 | 2.1 |
| | 5 | Walleye | 4 | 0.8 | 3.2 | 4.0 |
| | 5 | Shorthead Redhorse | 3 | 0.6 | 0.1 | 0.2 |
| | 5 | Northern Pike | 15 | 3.0 | 7.6 | 2.5 |
| | 5 | Golden Shiner | 1 | 0.2 | 0.0 | 0.2 |
| | 5 | Bowfin (Dogfish) | 4 | 0.8 | 2.6 | 3.3 |
| | 5 | Bluegill | 137 | 27.4 | 2.6 | 0.1 |
| | 5 | Black Crappie | 52 | 10.4 | 1.2 | 0.1 |
| | 5 | Black Bullhead | 42 | 8.4 | 3.8 | 0.5 |
| 7/19/1983 | 7 | Yellow Perch | 34 | 4.9 | 0.5 | 0.1 |
| | 7 | Walleye | 5 | 0.7 | 2.1 | 2.9 |
| | 7 | Pumpkinseed Sunfish | 1 | 0.1 | 0.0 | 0.1 |
| | 7 | Northern Pike | 21 | 3.0 | 7.5 | 2.5 |
| | 7 | Bluegill | 88 | 12.6 | 1.1 | 0.1 |
| | 7 | Black Crappie | 134 | 19.1 | 2.2 | 0.1 |
| | 7 | Black Bullhead | 52 | 7.4 | 4.0 | 0.5 |
| 7/20/1982 | 7 | Yellow Perch | 31 | 4.4 | 0.4 | 0.1 |
| | 7 | White Sucker | 1 | 0.1 | 0.1 | 0.5 |
| | 7 | White Crappie | 2 | 0.3 | 0.1 | 0.3 |
| | 7 | Walleye | 4 | 0.6 | 1.5 | 2.6 |
| | 7 | Northern Pike | 69 | 9.9 | 21.0 | 2.1 |
| | 7 | Largemouth Bass | 2 | 0.3 | 0.3 | 1.1 |
| | 7 | Channel Catfish | 2 | 0.3 | 1.9 | 6.5 |
| | 7 | Common Carp | 1 | 0.1 | 1.6 | 11.0 |
| | 7 | Bluegill | 72 | 10.3 | 1.1 | 0.1 |
| | 7 | Black Crappie | 69 | 9.9 | 1.2 | 0.1 |
| | 7 | Black Bullhead | 48 | 6.9 | 2.8 | 0.4 |
| 11/30/1981 | 7 | Yellow Perch | 53 | 7.6 | 0.9 | 0.1 |
| | 7 | Walleye | 13 | 1.9 | 4.8 | 2.6 |
| | 7 | Northern Pike | 45 | 6.4 | 15.0 | 2.3 |
| | 7 | Largemouth Bass | 4 | 0.6 | 0.7 | 1.3 |
| | 7 | Common Carp | 1 | 0.1 | 1.0 | 7.0 |
| | 7 | Bluegill | 74 | 10.6 | 1.6 | 0.2 |
| | 7 | Black Crappie | 25 | 3.6 | 0.4 | 0.1 |
| | 7 | Black Bullhead | 40 | 5.7 | 2.0 | 0.4 |
| 7/23/1980 | 7 | Yellow Perch | 49 | 7.0 | 0.7 | 0.1 |
| | 7 | Walleye | 7 | 1.0 | 2.4 | 2.4 |
| | 7 | Northern Pike | 28 | 4.0 | 15.5 | 3.9 |
| | 7 | Bluegill | 75 | 10.7 | 2.1 | 0.2 |
| | 7 | Black Crappie | 64 | 9.1 | 1.3 | 0.1 |
| | 7 | Black Bullhead | 44 | 6.3 | 2.8 | 0.4 |
| 9/19/1960 | 6 | Yellow Perch | 177 | 29.5 | 4.3 | 0.1 |
| | 6 | Walleye | 4 | 0.7 | 2.6 | 3.9 |

*Historical Gillnetting Catch Summary (continued)*

| Survey Date | Number of Nets | Species | Fish Caught | Number per Set | Lbs. per Set | Mean Weight (lbs) |
|---|---|---|---|---|---|---|
| | 6 | Shortnose Gar | 2 | 0.3 | 0.6 | 1.9 |
| | 6 | Northern Pike | 1 | 0.2 | 0.7 | 4.0 |
| | 6 | Gizzard Shad | 168 | 28.0 | 6.4 | 0.2 |
| | 6 | Brown Bullhead | 4 | 0.7 | 0.5 | 0.7 |
| | 6 | Bowfin (Dogfish) | 1 | 0.2 | 0.7 | 4.4 |
| | 6 | Black Crappie | 154 | 25.7 | 4.1 | 0.2 |
| 7/20/1953 | 6 | Yellow Bass | 1 | 0.2 | 0.2 | 1.1 |
| | 6 | Yellow Perch | 18 | 3.0 | 0.6 | 0.2 |
| | 6 | Walleye | 1 | 0.2 | 0.3 | 1.7 |
| | 6 | Shortnose Gar | 1 | 0.2 | 0.4 | 2.3 |
| | 6 | Shorthead Redhorse | 1 | 0.2 | 0.3 | 1.5 |
| | 6 | Northern Pike | 15 | 2.5 | 2.3 | 0.9 |
| | 6 | Goldeye | 4 | 0.7 | 0.1 | 0.1 |
| | 6 | Gizzard Shad | 3 | 0.5 | 0.2 | 0.4 |
| | 6 | Common Carp | 1 | 0.2 | 0.1 | 0.8 |
| | 6 | Bowfin (Dogfish) | 2 | 0.3 | 1.0 | 3.0 |
| | 6 | Black Crappie | 131 | 21.8 | 1.4 | 0.1 |
| | 6 | Black Bullhead | 3 | 0.5 | 0.2 | 0.4 |

## Length Frequency Distribution for Gillnetting

for Field Work between 7/21/1997 and 7/25/1997

| Length Category | BLB | BLC | BLG | BOF | BRB | CAP | GIS | GOS | HSF | LMB | NOP | PMK | WAE | WAM | WHC | YEB | YEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <3.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [ 3.00 , 3.50) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| [ 3.50 , 4.00) | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 |
| [ 4.00 , 4.50) | 0 | 0 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [ 4.50 , 5.00) | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [ 5.00 , 5.50) | 0 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 1 |
| [ 5.50 , 6.00) | 0 | 1 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 10 |
| [ 6.00 , 6.50) | 0 | 0 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 19 |
| [ 6.50 , 7.00) | 0 | 2 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 13 |
| [ 7.00 , 7.50) | 0 | 8 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| [ 7.50 , 8.00) | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| [ 8.00 , 8.50) | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 |
| [ 8.50 , 9.00) | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [ 9.00 , 9.50) | 5 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| [ 9.50 , 10.00) | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [10.00 , 10.50) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [10.50 , 11.00) | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [11.00 , 11.50) | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| [11.50 , 12.00) | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| [12.00 , 13.00) | 3 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [13.00 , 14.00) | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [14.00 , 15.00) | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [15.00 , 16.00) | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [16.00 , 17.00) | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| [17.00 , 18.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [18.00 , 19.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 |
| [19.00 , 20.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| [20.00 , 21.00) | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [21.00 , 22.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 |
| [22.00 , 23.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 4 | 0 | 0 | 0 | 0 |
| [23.00 , 24.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 |
| [24.00 , 25.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| [25.00 , 26.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| [26.00 , 27.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| [27.00 , 28.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| [28.00 , 29.00) | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| [29.00 , 30.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| [30.00 , 31.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| [31.00 , 32.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| [32.00 , 33.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| [33.00 , 34.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [34.00 , 35.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [35.00 , 36.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| >36.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 23 | 21 | 88 | 1 | 2 | 1 | 8 | 1 | 1 | 2 | 33 | 9 | 9 | 7 | 1 | 3 | 59 |
| Min. Length (inch) | 9.1 | 5.8 | 3.6 | 28.7 | 12.4 | 20.9 | 13.9 | 7.4 | 4.9 | 5.4 | 16.5 | 3.5 | 18.2 | 3.7 | 11.8 | 8.3 | 5.4 |
| Max. Length (inch) | 13.4 | 14.6 | 7.2 | 28.7 | 12.8 | 20.9 | 16.2 | 7.4 | 4.9 | 7.2 | 32.9 | 5.9 | 23.1 | 6.6 | 11.8 | 11.4 | 9.1 |
| Mean Length (inch) | 10.7 | 8.5 | 5.6 | 28.7 | 12.6 | 20.9 | 15.2 | 7.4 | 4.9 | 6.3 | 26.1 | 5.3 | 21.1 | 5.3 | 11.8 | 9.4 | 6.6 |
| % Measured | 100 | 100 | 100 | 100 | 100 | 100 | 80 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

## Trapnetting Catch Summary

Number of sets: 15
First net set on: 07/21/97
Last net lifted on: 07/25/97
Sampling method: Standard sampling

### Summary by Numbers

| Species | Total Fish | Number per Set | Quartiles for Lake Class 25% | 50% | 75% |
|---|---|---|---|---|---|
| Black Bullhead | 7 | 0.5 | 1.5 | 29.8 | 58.0 |
| Black Crappie | 99 | 6.6 | 2.1 | 13.1 | 24.1 |
| Bluegill | 561 | 37.4 | 3.5 | 30.3 | 57.1 |
| Bowfin (Dogfish) | 5 | 0.3 | 0.3 | 0.8 | 1.3 |
| Brown Bullhead | 3 | 0.2 | 0.4 | 2.7 | 5.1 |
| Common Carp | 2 | 0.1 | 0.4 | 1.4 | 2.4 |
| Golden Shiner | 1 | 0.1 | 0.3 | 0.9 | 1.6 |
| Hybrid Sunfish | 54 | 3.6 | N/A | N/A | N/A |
| Northern Pike | 5 | 0.3 | N/A | N/A | N/A |
| Pumpkinseed Sunfish | 48 | 3.2 | 0.7 | 3.6 | 6.5 |
| Walleye | 2 | 0.1 | 0.3 | 0.5 | 0.8 |
| Warmouth | 5 | 0.3 | N/A | N/A | N/A |
| White Crappie | 1 | 0.1 | 0.4 | 7.4 | 14.4 |
| Yellow Bullhead | 1 | 0.1 | 1.0 | 4.1 | 7.1 |
| Yellow Perch | 2 | 0.1 | 0.4 | 1.6 | 2.8 |
| | Total fish/set: | 53.1 | | | |

### Summary by Weight (lbs)

| Species | Total Fish | Lbs per Set | Mean Weight | Quartiles for Lake Class 25% | 50% | 75% |
|---|---|---|---|---|---|---|
| Black Bullhead | 7 | 0.2 | 0.5 | 0.2 | 0.4 | 0.5 |
| Black Crappie | 99 | 1.6 | 0.2 | 0.2 | 0.3 | 0.4 |
| Bluegill | 561 | 4.8 | 0.1 | 0.1 | 0.2 | 0.3 |
| Bowfin (Dogfish) | 5 | 1.8 | 5.4 | 2.5 | 3.3 | 4.2 |
| Brown Bullhead | 3 | 0.2 | 1.2 | 0.4 | 0.6 | 0.9 |
| Common Carp | 2 | 0.6 | 4.7 | 1.8 | 3.4 | 5.1 |
| Golden Shiner | 1 | 0.0 | 0.1 | 0.1 | 0.1 | 0.1 |
| Hybrid Sunfish | 54 | 0.6 | 0.2 | N/A | N/A | N/A |
| Northern Pike | 5 | 1.2 | 3.5 | N/A | N/A | N/A |
| Pumpkinseed Sunfish | 48 | 0.5 | 0.1 | 0.1 | 0.1 | 0.2 |

*Summary by Weight (lbs) (continued)*

| Species | Total Fish | Lbs per Set | Mean Weight | Quartiles for Lake Class 25% | 50% | 75% |
|---|---|---|---|---|---|---|
| Walleye | 2 | 0.6 | 4.2 | 0.9 | 2.2 | 3.5 |
| Warmouth | 5 | 0.0 | 0.1 | N/A | N/A | N/A |
| White Crappie | 1 | 0.0 | 0.4 | 0.2 | 0.3 | 0.4 |
| Yellow Bullhead | 1 | 0.1 | 1.0 | 0.4 | 0.6 | 0.8 |
| Yellow Perch | 2 | 0.0 | 0.2 | 0.1 | 0.2 | 0.2 |
| | Total lbs/set: | 12.2 | | | | |

*Historical Trapnetting Catch Summary*

| Survey Date | Number of Nets | Species | Fish Caught | Number per Set | Lbs. per Set | Mean Weight (lbs) |
|---|---|---|---|---|---|---|
| 7/15/1991 | 15 | Yellow Perch | 2 | 0.1 | 0.0 | 0.2 |
| | 15 | Warmouth | 9 | 0.6 | 0.1 | 0.1 |
| | 15 | Walleye | 2 | 0.1 | 0.0 | 0.3 |
| | 15 | Pumpkinseed Sunfish | 56 | 3.7 | 0.7 | 0.2 |
| | 15 | Northern Pike | 3 | 0.2 | 1.0 | 5.1 |
| | 15 | Hybrid Sunfish | 38 | 2.5 | 0.2 | 0.1 |
| | 15 | Green Sunfish | 27 | 1.8 | 0.2 | 0.1 |
| | 15 | Flathead Catfish | 1 | 0.1 | 0.3 | 5.2 |
| | 15 | Common Carp | 2 | 0.1 | 2.0 | 15.4 |
| | 15 | Bowfin (Dogfish) | 6 | 0.4 | 2.1 | 5.2 |
| | 15 | Bluegill | 1627 | 108.5 | 13.7 | 0.1 |
| | 15 | Black Crappie | 131 | 8.7 | 1.5 | 0.2 |
| | 15 | Black Bullhead | 27 | 1.8 | 1.1 | 0.6 |
| 8/25/1989 | 15 | Yellow Perch | 16 | 1.1 | 0.1 | 0.1 |
| | 15 | Warmouth | 5 | 0.3 | 0.1 | 0.2 |
| | 15 | Walleye | 3 | 0.2 | 0.2 | 0.8 |
| | 15 | Sauger | 1 | 0.1 | 0.0 | 0.4 |
| | 15 | Pumpkinseed Sunfish | 77 | 5.1 | 0.5 | 0.1 |
| | 15 | Northern Pike | 8 | 0.5 | 1.2 | 2.2 |
| | 15 | Brown Bullhead | 1 | 0.1 | 0.0 | 0.7 |
| | 15 | Bowfin (Dogfish) | 7 | 0.5 | 2.4 | 5.2 |
| | 15 | Bluegill | 1841 | 122.7 | 10.9 | 0.1 |
| | 15 | Black Crappie | 237 | 15.8 | 2.7 | 0.2 |
| | 15 | Black Bullhead | 62 | 4.1 | 1.6 | 0.4 |
| 10/13/1988 | 15 | Yellow Perch | 12 | 0.8 | 0.1 | 0.2 |
| | 15 | Warmouth | 3 | 0.2 | 0.0 | 0.2 |
| | 15 | Walleye | 1 | 0.1 | 0.0 | 0.3 |

*Historical Trapnetting Catch Summary (continued)*

| Survey Date | Number of Nets | Species | Fish Caught | Number per Set | Lbs. per Set | Mean Weight (lbs) |
|---|---|---|---|---|---|---|
| | 15 | Pumpkinseed Sunfish | 13 | 0.9 | 0.1 | 0.1 |
| | 15 | Northern Pike | 4 | 0.3 | 0.5 | 2.0 |
| | 15 | Common Carp | 1 | 0.1 | 0.2 | 2.6 |
| | 15 | Bowfin (Dogfish) | 14 | 0.9 | 4.1 | 4.4 |
| | 15 | Bluegill | 1545 | 103.0 | 13.0 | 0.1 |
| | 15 | Black Crappie | 420 | 28.0 | 5.2 | 0.2 |
| | 15 | Black Bullhead | 8 | 0.5 | 0.4 | 0.8 |
| 7/28/1987 | 15 | Yellow Perch | 4 | 0.3 | 0.0 | 0.1 |
| | 15 | Walleye | 6 | 0.4 | 0.5 | 1.2 |
| | 15 | Pumpkinseed Sunfish | 14 | 0.9 | 0.1 | 0.1 |
| | 15 | Northern Pike | 11 | 0.7 | 2.3 | 3.2 |
| | 15 | Brown Bullhead | 1 | 0.1 | 0.1 | 1.4 |
| | 15 | Bowfin (Dogfish) | 11 | 0.7 | 3.1 | 4.3 |
| | 15 | Bluegill | 1383 | 92.2 | 9.7 | 0.1 |
| | 15 | Black Crappie | 582 | 38.8 | 7.1 | 0.2 |
| | 15 | Black Bullhead | 5 | 0.3 | 0.3 | 0.9 |
| 7/29/1986 | 15 | Yellow Perch | 9 | 0.6 | 0.0 | 0.1 |
| | 15 | White Sucker | 1 | 0.1 | 0.2 | 2.6 |
| | 15 | White Crappie | 2 | 0.1 | 0.1 | 0.5 |
| | 15 | Warmouth | 3 | 0.2 | 0.0 | 0.1 |
| | 15 | Pumpkinseed Sunfish | 10 | 0.7 | 0.1 | 0.2 |
| | 15 | Northern Pike | 6 | 0.4 | 1.2 | 3.0 |
| | 15 | Largemouth Bass | 1 | 0.1 | 0.2 | 2.6 |
| | 15 | Hybrid Sunfish | 5 | 0.3 | 0.0 | 0.1 |
| | 15 | Brown Bullhead | 1 | 0.1 | 0.1 | 1.1 |
| | 15 | Bowfin (Dogfish) | 17 | 1.1 | 4.3 | 3.8 |
| | 15 | Bluegill | 1031 | 68.7 | 7.0 | 0.1 |
| | 15 | Black Crappie | 479 | 31.9 | 5.8 | 0.2 |
| | 15 | Black Bullhead | 2 | 0.1 | 0.0 | 0.1 |
| 7/30/1985 | 15 | Walleye | 1 | 0.1 | 0.3 | 3.8 |
| | 15 | Pumpkinseed Sunfish | 1 | 0.1 | 0.0 | 0.1 |
| | 15 | Northern Pike | 7 | 0.5 | 1.2 | 2.6 |
| | 15 | Hybrid Sunfish | 1 | 0.1 | 0.0 | 0.0 |
| | 15 | Bowfin (Dogfish) | 7 | 0.5 | 1.5 | 3.3 |
| | 15 | Bluegill | 469 | 31.3 | 3.4 | 0.1 |
| | 15 | Black Crappie | 226 | 15.1 | 2.9 | 0.2 |
| | 15 | Black Bullhead | 12 | 0.8 | 0.6 | 0.7 |
| 7/25/1984 | 15 | Yellow Perch | 6 | 0.4 | 0.1 | 0.2 |
| | 15 | White Crappie | 2 | 0.1 | 0.2 | 1.4 |
| | 15 | Pumpkinseed Sunfish | 3 | 0.2 | 0.0 | 0.1 |
| | 15 | Northern Pike | 2 | 0.1 | 0.3 | 1.9 |
| | 15 | Green Sunfish | 3 | 0.2 | 0.0 | 0.0 |
| | 15 | Bowfin (Dogfish) | 15 | 1.0 | 3.7 | 3.7 |

*Historical Trapnetting Catch Summary (continued)*

| Survey Date | Number of Nets | Species | Fish Caught | Number per Set | Lbs. per Set | Mean Weight (lbs) |
|---|---|---|---|---|---|---|
| | 15 | Bluegill | 538 | 35.9 | 3.6 | 0.1 |
| | 15 | Black Crappie | 158 | 10.5 | 1.5 | 0.1 |
| | 15 | Black Bullhead | 23 | 1.5 | 0.9 | 0.6 |
| 7/19/1983 | 15 | Yellow Perch | 10 | 0.7 | 0.1 | 0.1 |
| | 15 | White Crappie | 1 | 0.1 | 0.1 | 1.3 |
| | 15 | Warmouth | 1 | 0.1 | 0.0 | 0.1 |
| | 15 | Walleye | 1 | 0.1 | 0.4 | 6.5 |
| | 15 | Pumpkinseed Sunfish | 18 | 1.2 | 0.1 | 0.1 |
| | 15 | Northern Pike | 10 | 0.7 | 1.3 | 1.9 |
| | 15 | Green Sunfish | 6 | 0.4 | 0.0 | 0.1 |
| | 15 | Common Carp | 1 | 0.1 | 0.4 | 5.8 |
| | 15 | Brown Bullhead | 1 | 0.1 | 0.1 | 1.8 |
| | 15 | Bluegill | 1425 | 95.0 | 10.1 | 0.1 |
| | 15 | Black Crappie | 329 | 21.9 | 3.3 | 0.1 |
| | 15 | Black Bullhead | 52 | 3.5 | 2.0 | 0.6 |
| 7/20/1982 | 15 | Yellow Perch | 52 | 3.5 | 0.3 | 0.1 |
| | 15 | White Crappie | 1 | 0.1 | 0.0 | 0.4 |
| | 15 | Walleye | 6 | 0.4 | 1.4 | 3.6 |
| | 15 | Pumpkinseed Sunfish | 1 | 0.1 | 0.0 | 0.1 |
| | 15 | Northern Pike | 31 | 2.1 | 4.7 | 2.3 |
| | 15 | Green Sunfish | 1 | 0.1 | 0.0 | 0.1 |
| | 15 | Common Carp | 3 | 0.2 | 0.7 | 3.4 |
| | 15 | Bluegill | 1050 | 70.0 | 7.6 | 0.1 |
| | 15 | Black Crappie | 554 | 36.9 | 5.3 | 0.1 |
| | 15 | Black Bullhead | 112 | 7.5 | 4.0 | 0.5 |
| 11/30/1981 | 11 | Yellow Perch | 9 | 0.8 | 0.1 | 0.1 |
| | 11 | Walleye | 1 | 0.1 | 0.4 | 4.7 |
| | 11 | Northern Pike | 4 | 0.4 | 0.5 | 1.4 |
| | 11 | Channel Catfish | 1 | 0.1 | 0.9 | 10.0 |
| | 11 | Common Carp | 2 | 0.2 | 1.1 | 6.3 |
| | 11 | Bluegill | 557 | 50.6 | 9.5 | 0.2 |
| | 11 | Black Crappie | 78 | 7.1 | 1.3 | 0.2 |
| | 11 | Black Bullhead | 24 | 2.2 | 2.4 | 1.1 |
| 7/23/1980 | 15 | Walleye | 4 | 0.3 | 0.7 | 2.7 |
| | 15 | Northern Pike | 3 | 0.2 | 0.2 | 0.8 |
| | 15 | Freshwater Drum | 1 | 0.1 | 0.1 | 1.8 |
| | 15 | Bluegill | 464 | 30.9 | 6.2 | 0.2 |
| | 15 | Black Crappie | 43 | 2.9 | 0.5 | 0.2 |
| | 15 | Black Bullhead | 56 | 3.7 | 3.2 | 0.9 |
| 9/19/1960 | 12 | Yellow Perch | 7 | 0.6 | 0.2 | 0.3 |
| | 12 | White Sucker | 1 | 0.1 | 0.2 | 2.7 |
| | 12 | White Bass | 6 | 0.5 | 0.7 | 1.5 |
| | 12 | Walleye | 1 | 0.1 | 0.6 | 7.0 |

## Length Frequency Distribution for Trapnetting

for Field Work between 7/21/1997 and 7/25/1997

| Length Category | BLB | BLC | BLG | BOF | BRB | CAP | GOS | HSF | NOP | PMK | WAE | WAM | WHC | YEB | YEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <3.0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [ 3.00 , 3.50) | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| [ 3.50 , 4.00) | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [ 4.00 , 4.50) | 0 | 0 | 48 | 0 | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 1 | 0 | 0 | 0 |
| [ 4.50 , 5.00) | 0 | 0 | 50 | 0 | 0 | 0 | 0 | 3 | 0 | 4 | 0 | 2 | 0 | 0 | 0 |
| [ 5.00 , 5.50) | 0 | 0 | 60 | 0 | 0 | 0 | 0 | 10 | 0 | 17 | 0 | 0 | 0 | 0 | 0 |
| [ 5.50 , 6.00) | 0 | 1 | 63 | 0 | 0 | 0 | 0 | 4 | 0 | 11 | 0 | 0 | 0 | 0 | 0 |
| [ 6.00 , 6.50) | 0 | 12 | 65 | 0 | 0 | 0 | 0 | 6 | 0 | 11 | 0 | 1 | 0 | 0 | 0 |
| [ 6.50 , 7.00) | 0 | 9 | 52 | 0 | 0 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| [ 7.00 , 7.50) | 0 | 25 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 |
| [ 7.50 , 8.00) | 0 | 19 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| [ 8.00 , 8.50) | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [ 8.50 , 9.00) | 2 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [ 9.00 , 9.50) | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [ 9.50 , 10.00) | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| [10.00 , 10.50) | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [10.50 , 11.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [11.00 , 11.50) | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [11.50 , 12.00) | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [12.00 , 13.00) | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| [13.00 , 14.00) | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [14.00 , 15.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [15.00 , 16.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [16.00 , 17.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [17.00 , 18.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [18.00 , 19.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [19.00 , 20.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| [20.00 , 21.00) | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| [21.00 , 22.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [22.00 , 23.00) | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [23.00 , 24.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [24.00 , 25.00) | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [25.00 , 26.00) | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 0 | 0 |
| [26.00 , 27.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| [27.00 , 28.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [28.00 , 29.00) | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [29.00 , 30.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [30.00 , 31.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [31.00 , 32.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [32.00 , 33.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [33.00 , 34.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [34.00 , 35.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [35.00 , 36.00) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| >36.0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 7 | 99 | 359 | 5 | 3 | 2 | 1 | 32 | 5 | 48 | 2 | 5 | 1 | 1 | 2 |
| Min. Length (inch) | 8.5 | 6.0 | 2.4 | 24.0 | 11.4 | 20.5 | 7.2 | 3.9 | 20.1 | 3.0 | 19.5 | 4.5 | 9.7 | 12.0 | 7.0 |
| Max. Length (inch) | 12.8 | 10.1 | 7.6 | 28.3 | 13.5 | 22.0 | 7.2 | 7.0 | 26.9 | 7.2 | 25.7 | 7.3 | 9.7 | 12.0 | 7.9 |
| Mean Length (inch) | 10.2 | 7.6 | 5.5 | 25.5 | 12.7 | 21.3 | 7.2 | 5.5 | 24.9 | 5.5 | 22.6 | 5.5 | 9.7 | 12.0 | 7.4 |
| % Measured | 100 | 100 | 64 | 100 | 100 | 100 | 100 | 59 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

## Boat Electrofishing Catch Summary

Total run-time for all stations: 02:06:00
Total on-time for all stations: 02:06:00
Sampling date: 05/29/97
Target (netted) species: Largemouth Bass;
Sampling method: Standard sampling.

### Summary by Numbers

| Species | Total Number | Number per hr Run-time | Number per hr On-time |
|---|---|---|---|
| Largemouth Bass | 86 | 41.0 | 41.0 |

### Summary by Weight (lbs)

| Species | Total Weight | Lbs per hr Run-time | Lbs per hr On-time | Mean Weight |
|---|---|---|---|---|
| Largemouth Bass | 109.7 | 52.2 | 52.2 | 1.3 |

### Historical Electrofishing Catch Summary

There are no pre-93 electrofishing data.

## Length Frequency Distribution for Electrofishing

for Field Work between 5/29/1997 and 5/29/1997

| Length Category | LMB |
|---|---|
| <3.0 | 0 |
| [ 3.00 , 3.50) | 0 |
| [ 3.50 , 4.00) | 0 |
| [ 4.00 , 4.50) | 0 |
| [ 4.50 , 5.00) | 0 |
| [ 5.00 , 5.50) | 0 |
| [ 5.50 , 6.00) | 0 |
| [ 6.00 , 6.50) | 1 |
| [ 6.50 , 7.00) | 0 |
| [ 7.00 , 7.50) | 5 |
| [ 7.50 , 8.00) | 9 |
| [ 8.00 , 8.50) | 3 |
| [ 8.50 , 9.00) | 5 |
| [ 9.00 , 9.50) | 3 |
| [ 9.50 , 10.00) | 2 |
| [10.00 , 10.50) | 2 |
| [10.50 , 11.00) | 1 |
| [11.00 , 11.50) | 2 |
| [11.50 , 12.00) | 4 |
| [12.00 , 13.00) | 4 |
| [13.00 , 14.00) | 12 |
| [14.00 , 15.00) | 13 |
| [15.00 , 16.00) | 11 |
| [16.00 , 17.00) | 6 |
| [17.00 , 18.00) | 1 |
| [18.00 , 19.00) | 1 |
| [19.00 , 20.00) | 1 |
| [20.00 , 21.00) | 0 |
| [21.00 , 22.00) | 0 |
| [22.00 , 23.00) | 0 |
| [23.00 , 24.00) | 0 |
| [24.00 , 25.00) | 0 |
| [25.00 , 26.00) | 0 |
| [26.00 , 27.00) | 0 |
| [27.00 , 28.00) | 0 |
| [28.00 , 29.00) | 0 |
| [29.00 , 30.00) | 0 |
| [30.00 , 31.00) | 0 |
| [31.00 , 32.00) | 0 |
| [32.00 , 33.00) | 0 |
| [33.00 , 34.00) | 0 |
| [34.00 , 35.00) | 0 |
| [35.00 , 36.00) | 0 |
| >36.0 | 0 |
| Total | 86 |
| Min. Length (inch) | 6.5 |
| Max. Length (inch) | 19.6 |
| Mean Length (inch) | 12.3 |
| % Measured | 100 |

## Discussion

GILLNETTING catch rates indicate average numbers of northern pike, walleye, and yellow perch when compared to other class 38 lakes. Northern pike abundance has fluctuated over the past ten years, declining steadily from 4.0/net in 1988 to 1.3/net in 1993, and increasing up to 5.5/net in 1997. Northern pike size structure is very good with PSD and RSD-28 at 89 and 32, respectively. Mean individual weight was 4.5 pounds (N=33) which is above average for lake class 38. Ages I - VI were represented in the sample. Walleye relative abundance was 1.5/net which is just above the lower quartile for lake class 38. A 1992 walleye fingerling stocking comprised the bulk of the walleye sample (67%, N=9), and mean individual length was 21 inches. Similar to northern pike, yellow perch relative abundance (9.8/net) has fluctuated over the past decade. Abundance correlations between the two species is not evident.

TRAPNETTING catch rates for bluegill and black crappie (37.4 and 6.6/net) was within the expected range for lake class 38. Mean bluegill length was 5.5 inches (N=359), with almost 70% percent of the population consisting of three and four-year-old fish. Rate of growth is average to slightly above average for the lake class (Tomcko 1997). Black crappie relative abundance declined steadily from 38.8/net in 1987 to 1.6 and 1.9/net in 1991 and 1993, respectively. Abundance increased slightly in 1997, and average individual size was 7.6 inches (N=99). The 1991 black crappie year class was not sampled with trapnets or any other gear type.

ELECTROFISHING catch rate for largemouth bass was 41/h, with individual lengths ranging from 6 to 19.6 inches. Mean length was 12.3 inches (N=86) and PSD and RSD-15 were 69 and 28, respectively (N=71). Age class distribution is represented well by fish ranging from II through IX.

SEINING to determine forage and gamefish YOY abundance collected a total of 2418 YOY bluegill (484/haul or about 8000/acre). Mean length of YOY bluegill and largemouth bass was 1.2 and 3.3 inches, respectively. Other species collected included hybrid sunfish and pumpkinseed. No other species were captured.

Based on data collected during this survey, largemouth bass and northern pike have the greatest potential at providing quality angling opportunities. The largemouth bass population continues to maintain a stable condition. Relative weight determinations for northern pike indicate very good individual condition for all sizes sampled. Past interpretations of slow bluegill growth rates in Lake Winona have been based on a statewide average developed as a reference standard in the old lake survey manual. Recent work by C. Tomcko verifies assertions that the standard was too high. Even when compared to all Minnesota lake classes combined, bluegill growth rates in Lake Winona are about average. Dissolved oxygen concentrations during July were precarious throughout much of the lake, particularly in the southeast basin.

## Status of the Fishery

Lake Winona comprises two basins totaling 318 acres. Located in the City of Winona, the lake is a popular fishing spot. Sunfish abundance, consisting of mostly bluegill, is about average when compared to other Minnesota lakes similar in character. Bluegill individual size only averages about 5.5 inches. Nevertheless, good fishing (especially for kids) can be had from any one of three fishing piers. Despite thick vegetation which covers most of the lake during early summer, the lake has always produced good largemouth bass fishing. Spring electrofishing sampled a wide size range of largemouth bass, some up to 19 inches. The lake also contains some very nice northern pike, averaging 4.5 pounds each during a 1997 survey. To provide an additional challenge to anglers, walleye fingerlings have been stocked annually since 1989. Presently, walleye abundance (1.5/net) is about what we'd expect to see in a lake similar to Winona. Some nice size walleyes up to 24 inches were sampled in 1997. Other gamefish species present that can provide occasional action are black crappie and yellow perch.

Referenced literature

Tomcko, C.M. 1997. Bluegill growth rates in Minnesota. Minnesota DNR Section of Fisheries Investigation Report Number 458.

Tim Schlagenhaft 4/28/98

Area Fisheries Supervisor Date

Mark Hyatt 5/9/98

Regional Fisheries Manager Date

**AGE CLASS DISTRIBUTION (number and mean length at age)**

| Species | Sample size | Subsample size (scales) | | I 96 | II 95 | III 94 | IV 93 | V 92 | VI 91 | VII 90 | VIII 89 | IX 88 | X 87 | XI 86 | XII 85 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Northern pike | 38 | 38 | Number | 2 | 4 | 6 | 15 | 7 | 5 | | | | | | |
| | | | $\bar{x}$ length | 9.8 | 15.4 | 19.8 | 22.8 | 24.9 | 25.2 | | | | | | |
| Bluegill | 447 | 109 | | 4 | 16 | 142 | 167 | 80 | 22 | 5 | 10 | 1 | | | |
| | | | | 1.9 | 3.2 | 4.2 | 5.2 | 5.8 | 6.2 | 6.4 | 6.8 | 7.5 | | | |
| Black crappie | 120 | 65 | | | 37 | 49 | 22 | 8 | | 3 | | | | | |
| | | | | 3.8 | 5.8 | 7.2 | 8.4 | 9.6 | 10.0 | 10.0 | | | | | |
| Largemouth bass | 85 | 85 | | | 22 | 12 | 8 | 13 | 18 | 6 | 3 | 3 | | | |
| | | | | 3.7 | 5.8 | 8.0 | 10.1 | 12.0 | 13.5 | 14.8 | 15.4 | - | | | |
| Walleye | 11 | 9 | | | | | 1 | 6 | 2 | | | | | | |
| | | | | 6.0 | 10.2 | 14.3 | 17.5 | 20.1 | 21.8 | | | | | | |