Elk Lake, Antrim and Grand Traverse counties
T. 28, 29 N., R. 8, 9 W., Sec. many

## Lake surveys

### Physical and chemical data surveyed August 1931

| | |
|---|---|
| Temperature (°F) | |
| Surface | 74 |
| Bottom | 45 |
| Thermocline | began at 40 feet |

| | |
|---|---|
| Secchi disk (feet) | 9.6 |
| pH | 8.0 |

### Surveyed August 1956

| | |
|---|---|
| Area (acres) | 7,930 |
| Depth (feet) | |
| Maximum | 192 |
| Mean | 54.3 |
| Percent shoal <15 feet deep | 15 |
| Secchi disk (feet) | 10-14 |
| Vegetation | sparse |

| | |
|---|---|
| Temperature (°F) | |
| Surface | 68-71 |
| Bottom | 44-45 |
| Thermocline | began at 39 feet |
| Surface Alkalinity (ppm) | 128-137 |
| Oxygen (ppm) | |
| Surface | 8.5-8.8 |
| Bottom | 8.8-9.4 |
| Bottom type | |
| Shoal | sand, gravel, rubble |
| Depths | marl, organic |

### Tributaries, dams and watershed drainage

Main inlets: Round Lake, Battle and Williamsburg creeks.

Main outlets: Elk River into Grand Traverse Bay.

Dams: On Elk River constructed in 1891; another constructed in 1915 about 2 miles from lake; controls lake level.

Watershed drainage (acres): 254,470

## Fish collections

Survey in July 1891: reported presence of trout sp.(?), burbot, herring, rock bass, northern pike, yellow perch, whitefish and white sucker.

Survey in 1923: reported presence of lake trout, yellow perch, rock bass, and smallmouth bass.

| Species | Number of fish collected | | |
|---|---|---|---|
| | July, August 1931[a] | August 1956[b] | Sept., Oct. 1971[c] |
| Yellow perch | 57 | 148 | 24 |
| Rock bass | 234 | 53 | 30 |
| Pumpkinseed | ... | 2 | ... |
| Bluegill | ... | 3 | ... |
| Longear sunfish | ... | 46 | ... |
| Smallmouth bass | ... | 9 | ... |
| Largemouth bass | 1 | ... | ... |
| Northern pike | 11 | 8 | ... |
| Muskellunge | 1 | 3 | ... |
| Burbot | ... | 1 | 7 |
| Catfish | 1 | ... | ... |
| Total | 305 | 273 | 61 |
| Lake trout | ... | ... | 3 |
| Rainbow trout | ... | 17 | ... |
| Brown trout | ... | ... | 1 |
| Splake | ... | ... | 70 |
| Whitefish | 31 | ... | 60 |
| Cisco | 28 | 28 | 66 |
| Total | 59 | 45 | 200 |
| White sucker | 303 | 76 | 23 |
| Bullhead | 63 | 7 | ... |
| Longnose gar | ... | 1 | ... |
| Total | 366 | 84 | 23 |

(continued, next page)

Fish collections, continued

| Species | Number of fish collected | | |
|---|---|---|---|
| | July, August 1931[a] | August 1956[b] | Sept., Oct. 1971[c] |
| Sand shiner | 651 | 345 | ... |
| Common shiner | 109 | 36 | ... |
| Blacknose shiner | 1 | 3 | ... |
| Rosyface shiner | 4 | 2 | ... |
| Bluntnose minnow | 629 | 238 | ... |
| Creek chub | ... | 1 | ... |
| Longnose dace | 33 | ... | ... |
| Redbelly dace | ... | 2 | ... |
| Johnny darter | 28 | 16 | ... |
| Iowa darter | 13 | 3 | ... |
| Logperch | 14 | 36 | ... |
| Mudminnow | 1 | 1 | ... |
| Sculpin | ... | 2 | ... |
| Total | 1,483 | 685 | 0 |
| Grand total | 2,213 | 1,087 | 284 |

[a] Collected with gill net, trap net and seine.

[b] Collected with gill net, seine and hook and line.

[c] Collected with gill net.

Catch per unit effort

| Species | Catch per 1000 feet of gill net | | |
|---|---|---|---|
| | August 1931[a] | August 1956[b] | Sept., Oct. 1971[c] |
| Yellow perch | 39.4 | 10.7 | 3.0 |
| Rock bass | .... | 3.4 | 3.8 |
| Smallmouth bass | 0.7 | 0.5 | ... |
| Northern pike | 0.7 | 0.6 | ... |
| Muskellunge | .... | 0.2 | ... |
| Burbot | .... | <0.1 | 0.9 |
| White sucker | 23.9 | ... | 7.5 |
| Cisco | 24.6 | 2.1 | 8.2 |
| Rainbow trout | .... | <0.1 | ... |
| Brown trout | .... | ... | 0.1 |
| Lake trout | .... | 0.2 | 0.4 |
| Splake | .... | ... | 8.8 |
| White sucker | 4.9 | 2.5 | 2.9 |

[a] Total of 1,420 feet of experimental gill net set.

[b] Total of 13,250 feet of experimental gill net set.

[c] Total of 8,000 feet of gill net set.

## Catch per unit effort

| Species | Catch per trap net | Catch per acre seine | Catch per 100 feet of shore line with seine |
|---|---|---|---|
| | August 1931[a] | August 1931[b] | August 1956[c] |
| Yellow perch | <0.1 | .... | 1.4 |
| Rock bass | 6.4 | 9.1 | 1.9 |
| Bluegill | .... | .... | 0.7 |
| Longear sunfish | .... | .... | 9.4 |
| Pumpkinseed | .... | .... | 0.5 |
| Smallmouth bass | 6.2 | 7.8 | 0.7 |
| Largemouth bass | .... | 0.4 | .... |
| Northern pike | 0.2 | .... | .... |
| Muskellunge | .... | 0.4 | .... |
| White sucker | 1.4 | 81.6 | 10.1 |
| Bullhead | 0.2 | .... | 1.6 |
| Longnose gar | .... | .... | 0.2 |
| Sand shiner | .... | 268 | 81.2 |
| Common shiner | .... | 54.8 | 8.5 |
| Rosyface shiner | .... | 20.2 | 0.5 |
| Blacknose shiner | .... | 0.4 | 0.7 |
| Bluntnose minnow | .... | 259 | 56.0 |
| Longnose dace | .... | 7.8 | .... |
| Creek chub | .... | .... | 0.2 |
| Redbelly dace | .... | .... | 0.5 |
| Johnny darter | .... | 11.1 | 3.8 |
| Iowa darter | .... | 4.9 | 0.7 |
| Logperch | .... | 5.8 | 8.2 |
| Mudminnow | .... | 0.4 | 0.2 |
| Sculpin | .... | .... | 0.5 |

[a] Total of 12 trap net days.

[b] Total of 2.43 acres seined.

[c] Total of 425 feet of shoreline seined.

## Age and growth

| Species | Mean growth rate index[1] for collections on different dates; number of scale samples in parentheses; age groups represented given in Roman numerals | |
|---|---|---|
| | August 1956 | Sept, Oct 1971 |
| Yellow perch | -0.6<br>(136)<br>IV-VII, IX | -0.5<br>(13)<br>III |
| Rock bass | -0.4<br>(42)<br>III-VI | 0.0<br>(13)<br>III, VII |
| Smallmouth bass | 0.0<br>(5)<br>II | |
| Northern pike | +1.3<br>(5)<br>III | |
| Cisco | -0.8<br>(22)<br>I, III | +1.1<br>(58)<br>V-IX |

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[1] Deviation in inches from statewide growth rate averages; only age groups with at least five samples are included.

## Age and growth of whitefish and splake

| Date | Species | Number of fish | Age group | Mean length (inches) |
|---|---|---|---|---|
| Sept, Oct 1971 | Splake | 17 | I | 9.3 |
| | | 26 | II | 13.6 |
| | | 22 | III | 16.8 |
| | | 3 | IV | 19.8 |
| | Whitefish | 17 | II | 13.1 |
| | | 16 | III | 15.5 |
| | | 5 | IV | 17.0 |
| | | 16 | V | 18.7 |
| | | 4 | VI | 19.6 |
| | | 1 | VII | 21.3 |

## Census of angling

### General creel census

| Date | Number of anglers | Total hours fished | Number of fish caught | Catch per hour |
|---|---|---|---|---|
| 1928-39[a] | ... | 411 | 328 | 0.80 |
| 1940-45 | ... | 563 | 214 | 0.38 |
| 1946-51[b] | 124 | 397 | 102 | 0.26 |
| 1952-57[c] | 185 | 561 | 200 | 0.36 |
| 1958-64 | 461 | 1,314 | 235 | 0.18 |

[a] Years of 1930, 1932, 1933, 1935, and 1936 not included.

[b] Year of 1949 not included.

[c] Years of 1953 and 1954 not included.

### Species composition of catch from general creel census

| Species | Percent of total catch | | | | |
|---|---|---|---|---|---|
| | 1928-39 | 1940-45 | 1946-51 | 1952-57 | 1958-64 |
| Yellow perch | 49.7 | 29.0 | 41.2 | 67.5 | 31.9 |
| Rock bass | 28.0 | 38.8 | 15.7 | 8.5 | 21.3 |
| Pumpkinseed | 1.2 | 0.5 | .... | 0.5 | .... |
| Bluegill | .... | .... | 4.9 | .... | .... |
| Smallmouth bass | 15.5 | 18.2 | .... | 4.5 | 3.4 |
| Muskellunge | 0.3 | 0.5 | 6.9 | .... | 0.4 |
| Northern pike | 1.2 | 1.4 | 2.0 | 1.5 | 0.4 |
| Lake trout | 2.1 | 10.3 | 27.5 | 16.0 | 26.8 |
| Rainbow trout | .... | .... | 1.0 | .... | 8.1 |
| Whitefish | .... | 0.5 | .... | .... | 6.8 |
| Others | 2.0[a] | 0.8[b] | 0.8[c] | 1.5[d] | 0.9[e] |

[a] Includes largemouth bass, cisco and bullhead.

[b] Largemouth bass.

[c] Brook trout.

[d] White sucker.

[e] Includes brown trout and carp.

Estimated angler effort,
from mail survey
(includes Skegemog Lake)

| Year | Number of angler days |
|---|---|
| 1970 | 8,120 |
| 1973 | 22,770 |

Estimated angler catch,
from mail survey in 1970
(includes Skegemog Lake)

| Species | Estimated catch | Catch per angler day |
|---|---|---|
| Yellow perch | 11,470 | 1.41 |
| Bass | 420 | 0.05 |
| Northern pike | 750 | 0.09 |
| Suckers | 1,400 | 0.17 |

Shanty counts by airplane

| Date | Number |
|---|---|
| 2/15/57 | 46 |
| 2/19/58 | 131 |
| 2/11/59 | 71 |
| 2/18/60 | 103 |
| 2/20/61 | 97 |

Muskellunge harvest

Harvest by spearing from questionnaire survey

1953: Estimated 16 muskellunge
1954: Estimated 24 muskellunge
1954: Estimated 163 hours required to spear one muskellunge