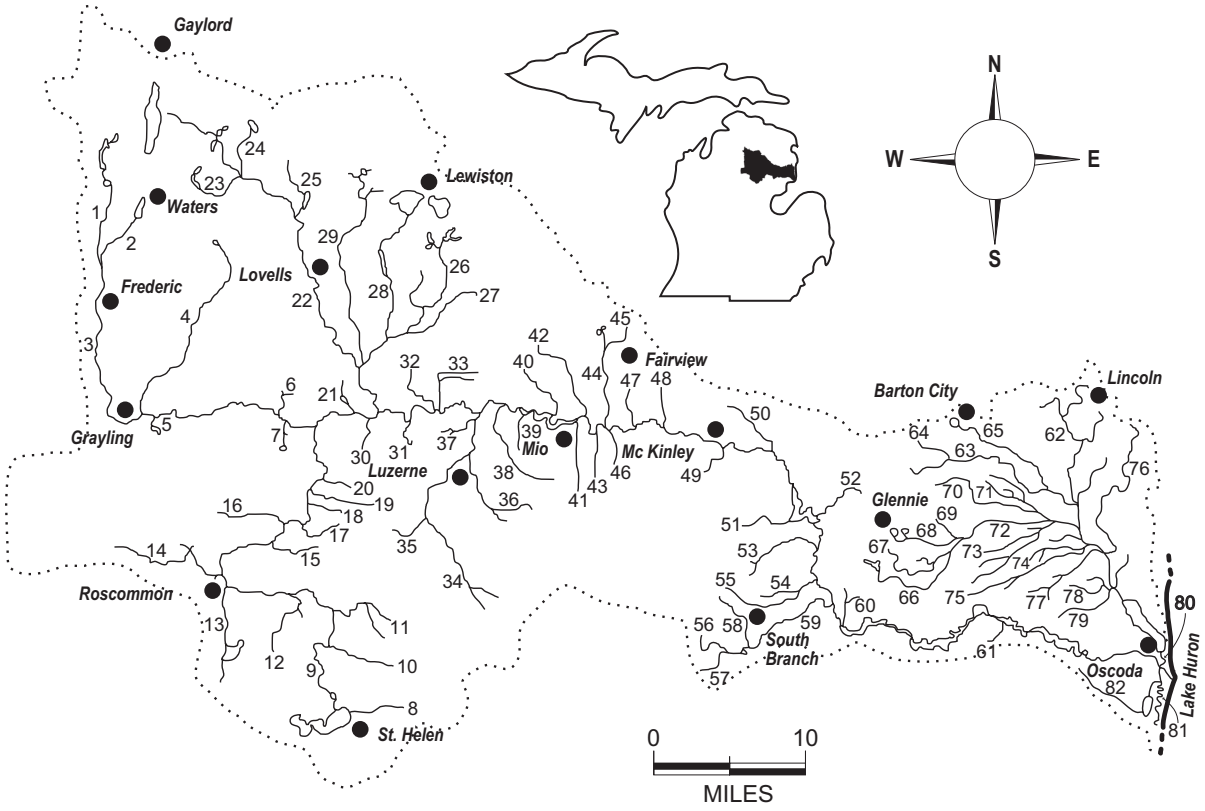
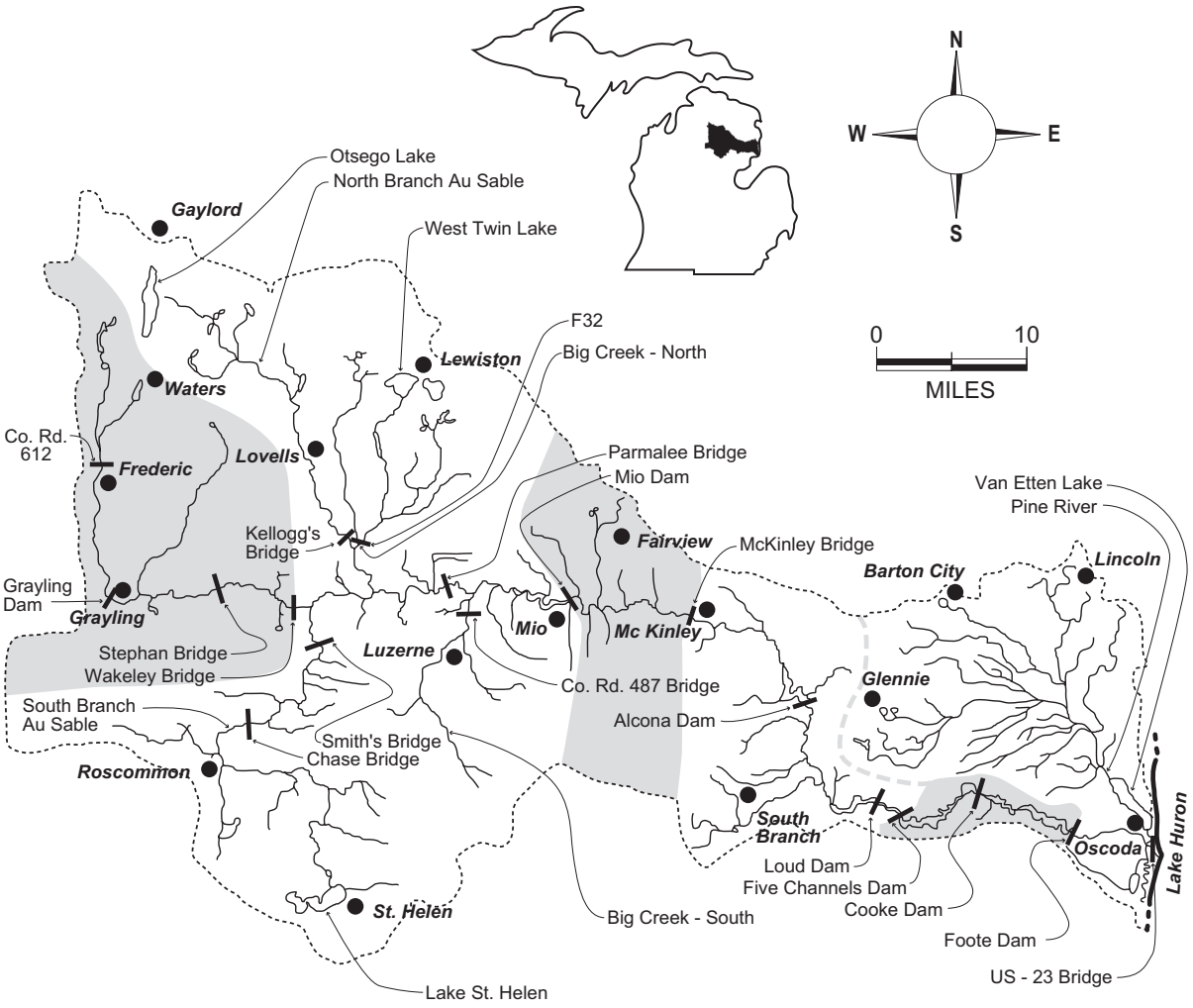


Figure 1.–Major tributaries of the Au Sable River.

1. Kolke Creek
2. Bradford Creek
3. Au Sable River
4. East Branch Au Sable River
5. Shellenbarger Creek
6. Barker Creek
7. Wakeley Creek
8. Marsh Creek
9. South Branch Au Sable River
10. South Creek
11. East Creek
12. Hudson Creek
13. Robinson Creek
14. Beaver Creek
15. Hickey Creek
16. Thayer Creek
17. Douglas Creek
18. Sauger Creek
19. White Creek
20. Grace Creek
21. Conner's Creek
22. North Branch Au Sable River
23. Chub Creek
24. Turtle Creek
25. Crapo Creek
26. East Branch Big Creek - North
27. Wright Creek
28. Middle Branch Big Creek - North
29. West Branch Big Creek - North
30. Gammy Creek
31. Whitewater Creek
32. Sohn Creek
33. Beaver Creek
34. West Branch Big Creek - South
35. Hunt Creek
36. East Branch Big Creek - South
37. Red Creek
38. Lost Creek
39. Antler Creek
40. Honeywell Creek
41. Wolf Creek
42. Cherry Creek
43. Loud Creek
44. Perry Creek
45. Gusler Creek
46. Cauchy Creek
47. Comins Creek
48. Glennie Creek
49. Nine Mile Creek
50. Blockhouse Creek
51. Wilbur Creek
52. Bamfield Creek
53. Smith Creek
54. Hoppy Creek
55. Stewart Creek
56. Mink Creek
57. Harper Creek
58. Au Sable Creek
59. South Branch River
60. Stuart Creek
61. Wildcat Creek
62. East Branch Pine River
63. West Branch Pine River
64. Loud Creek
65. Backus Creek
66. Bryant Creek
67. Wallace Creek
68. Kurtz Creek
69. Samyn Creek
70. McGillis Creek
71. Gimlet Creek
72. South Branch Pine River
73. McDonald Creek
74. Roy Creek
75. Grey Creek
76. Van Etten Creek
77. Duval Creek
78. Hill Creek
79. Coppler Creek
80. Pine River (Van Etten Creek)
81. Old Au Sable River
82. State Ditch



Au Sable River Valley Segments

Headwaters to Wakeley Bridge
Wakeley Bridge to Mio Pond
Mio Pond to McKinley Bridge
McKinley Bridge to Five Channels Dam
Five Channels Dam to Foote Dam
Foote Dam to Lake Huron

Figure 2.–General sites and river valley segments within the Au Sable River watershed. The dams shown here form ponds having the same name. Roads for differently named bridges are: Kellogg's Bridge = F32; Smith's Bridge = M-72; Parmalee Bridge = County Road 485.

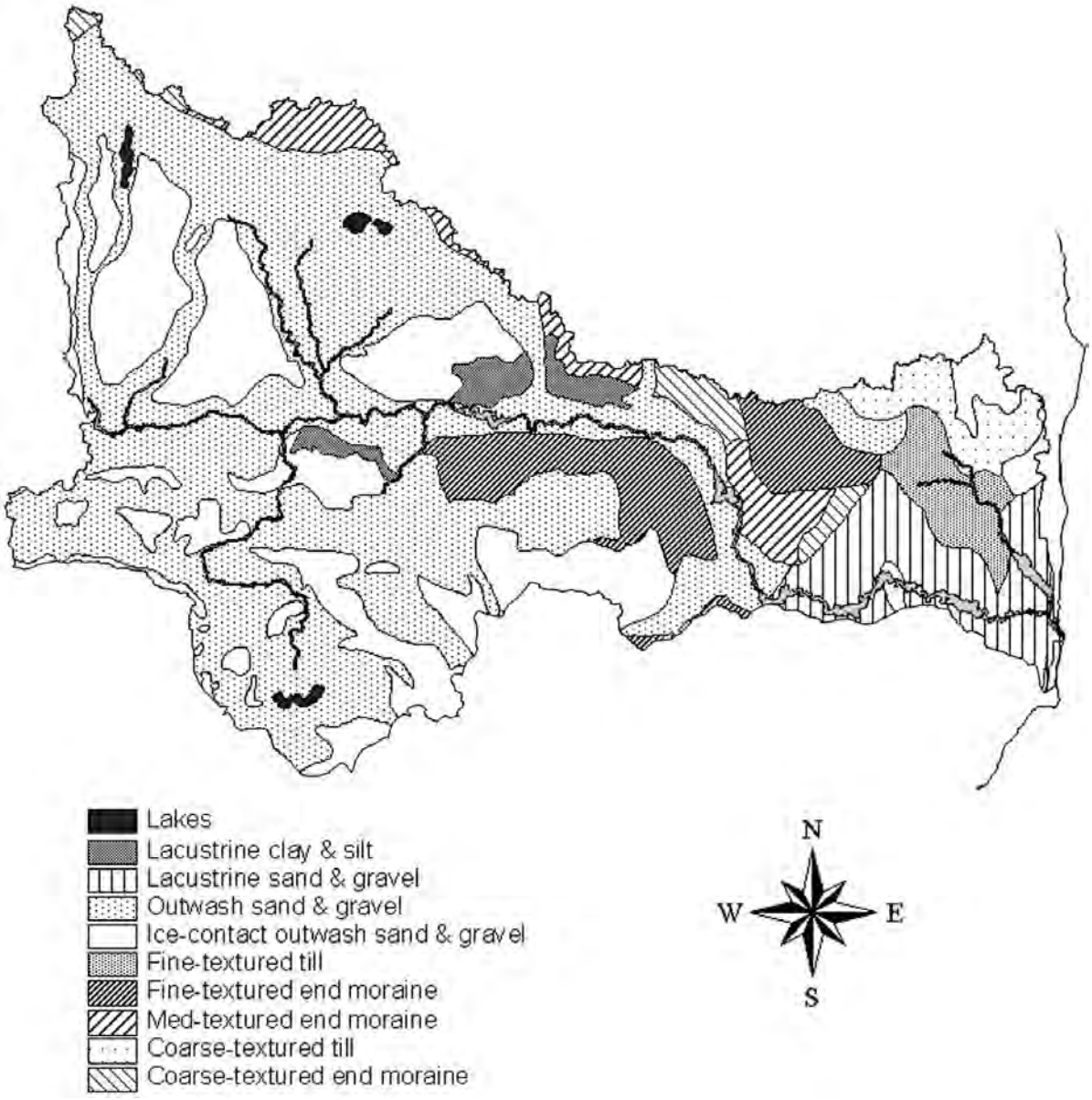


Figure 3.–Surface geology of the Au Sable River watershed. Data from Farrand and Bell (1982).

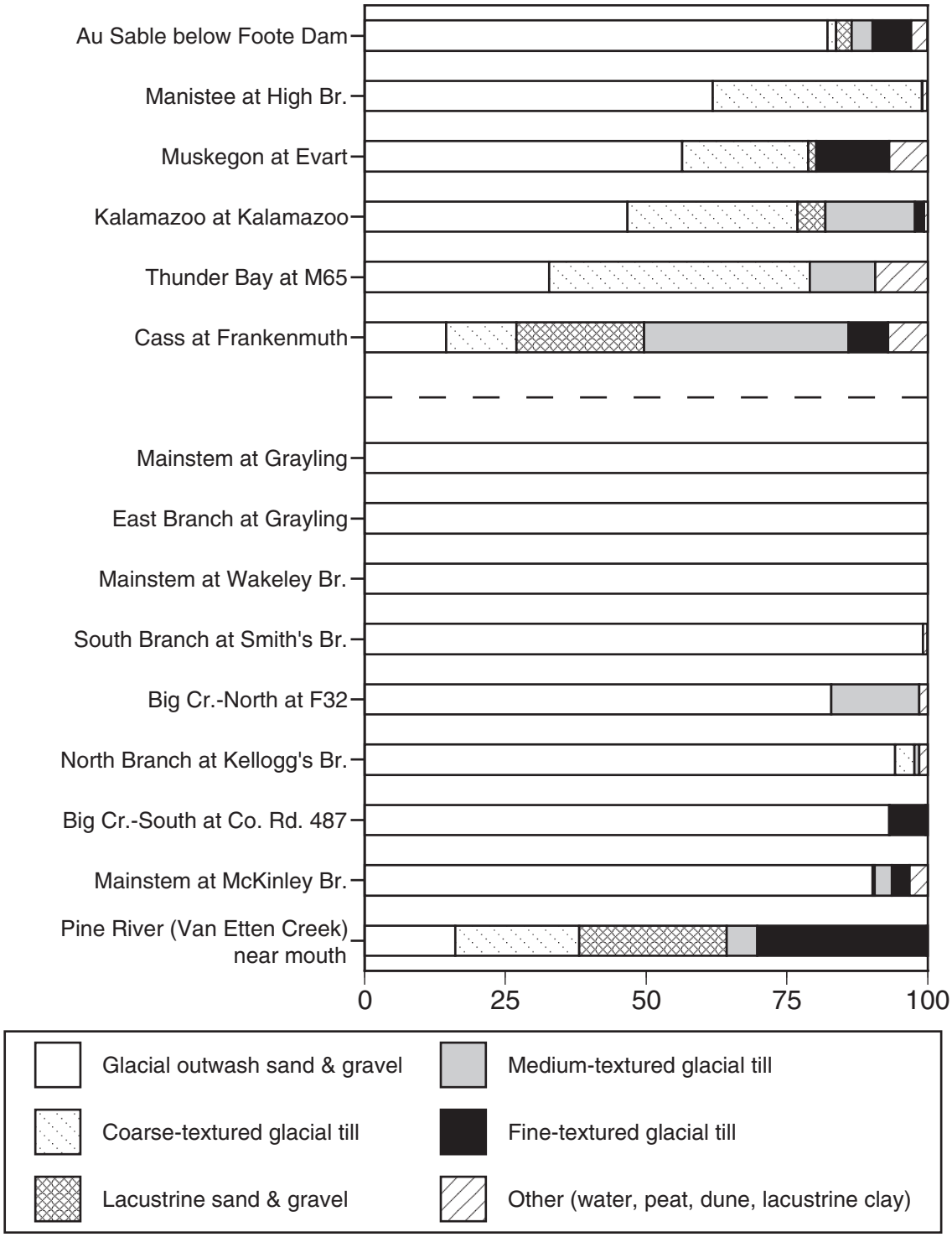


Figure 4.–Percent composition of the surficial geology for Michigan catchments similar in size to the Au Sable River below Foote Dam, and for catchments of segments and tributaries throughout the Au Sable River watershed. Data from Michigan Department of Natural Resources, Fisheries Division records.

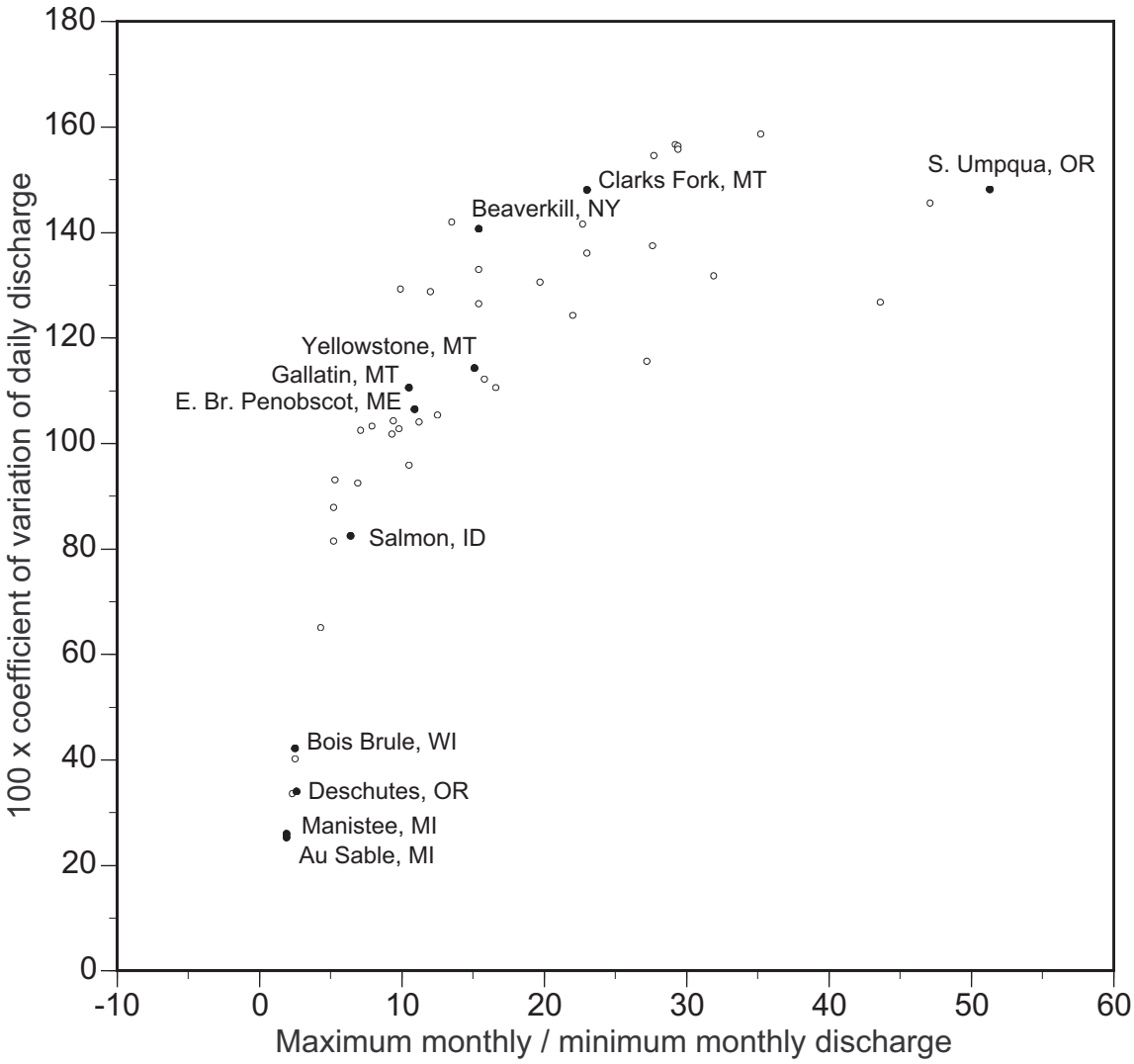


Figure 5.–Flow stability of United States trout streams as shown by two measures: 1) ratio of the monthly average flows for the months having the highest and lowest monthly average flows; 2) coefficient of variation for daily flow values over the water year (calculated as the standard deviation of daily flows divided by the mean daily flow times 100). Lower values on either axis indicate greater hydrologic stability. Both the Au Sable and Manistee rivers are in the lowest, left-most corner of the graph. Data from United States Geological Survey and Michigan Department of Natural Resources, Fisheries Division records.

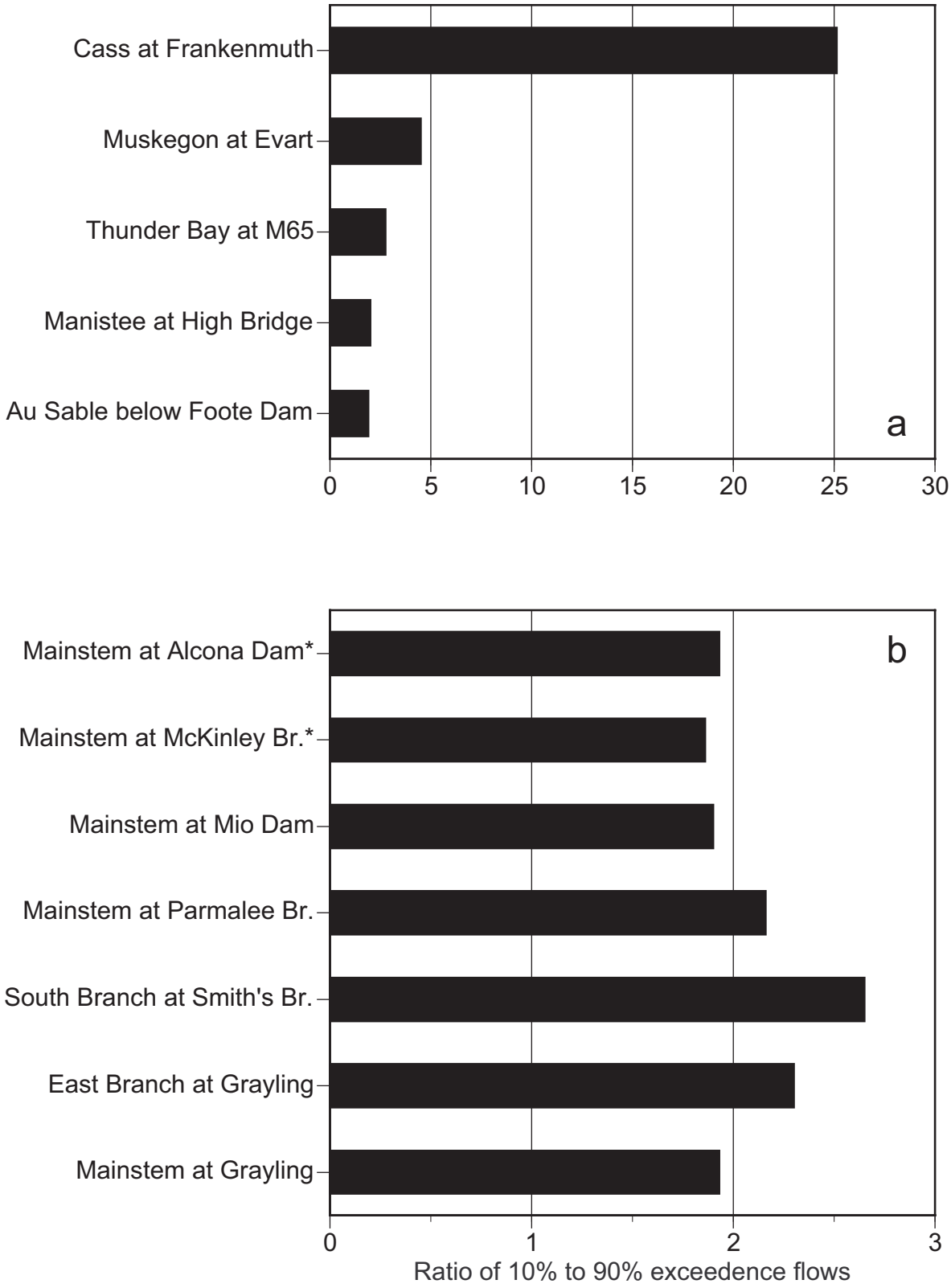


Figure 6.–Flow stability (expressed as the ratio of 10% and 90% exceedence flows) of: a) Michigan streams having catchments comparable in size to the Au Sable River below Foote Dam; and b) gauged Au Sable River catchments upstream of Mio. Data from United States Geological Survey. * indicates data for 1997 only.

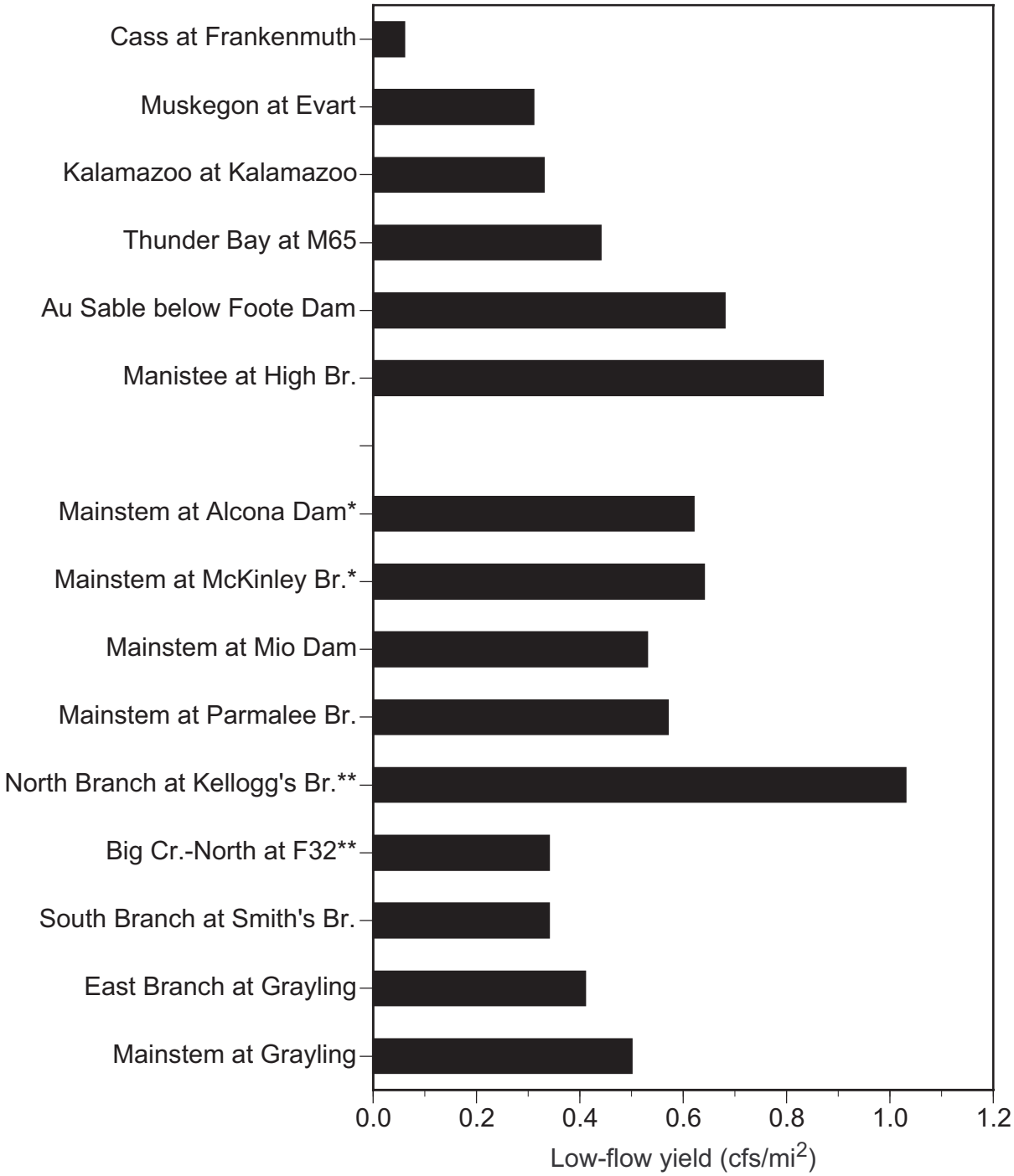


Figure 7.–Low-flow yield (90% exceedence flow divided by catchment area) of Michigan streams having catchments comparable in size to the Au Sable River below Foote Dam, and for Au Sable River catchments having USGS streamflow data. Data from United States Geological Survey and Michigan Department of Natural Resources, Fisheries Division records. * indicates data for 1997 only. ** indicates USGS miscellaneous low-flow discharge measurement.

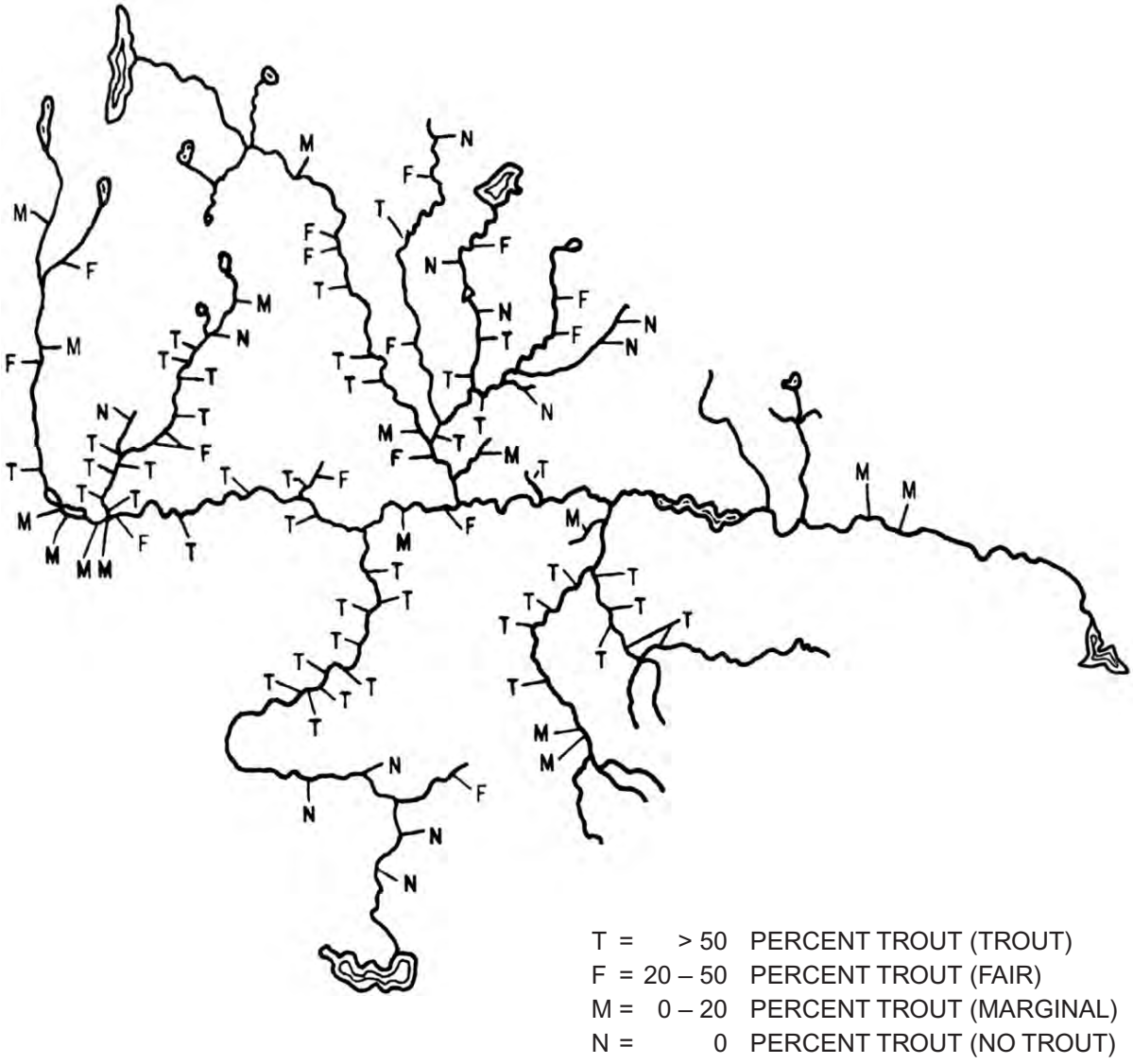


Figure 8.–Classification of sites in the Au Sable River upstream of Alcona Pond according to the percent of the electrofishing catch made up by trout. Figure from Coopes et al. (1974).

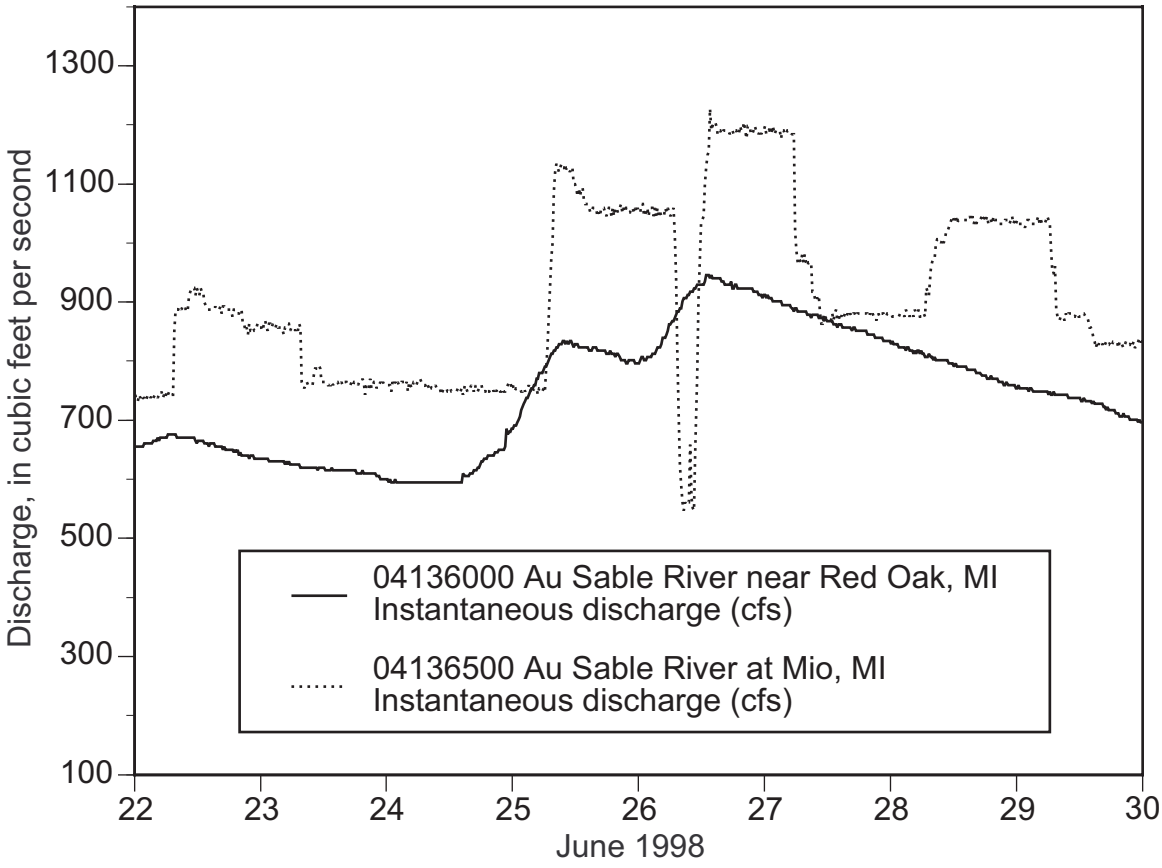


Figure 9.–Instantaneous streamflow measurements for June 22-30, 1998 for the Au Sable River in riverine reaches above (near Red Oak) and below (at Mio) Mio Pond. Water levels of Mio Pond were lowered for inspections of Mio Dam on June 25th. Data from United States Geological Survey.

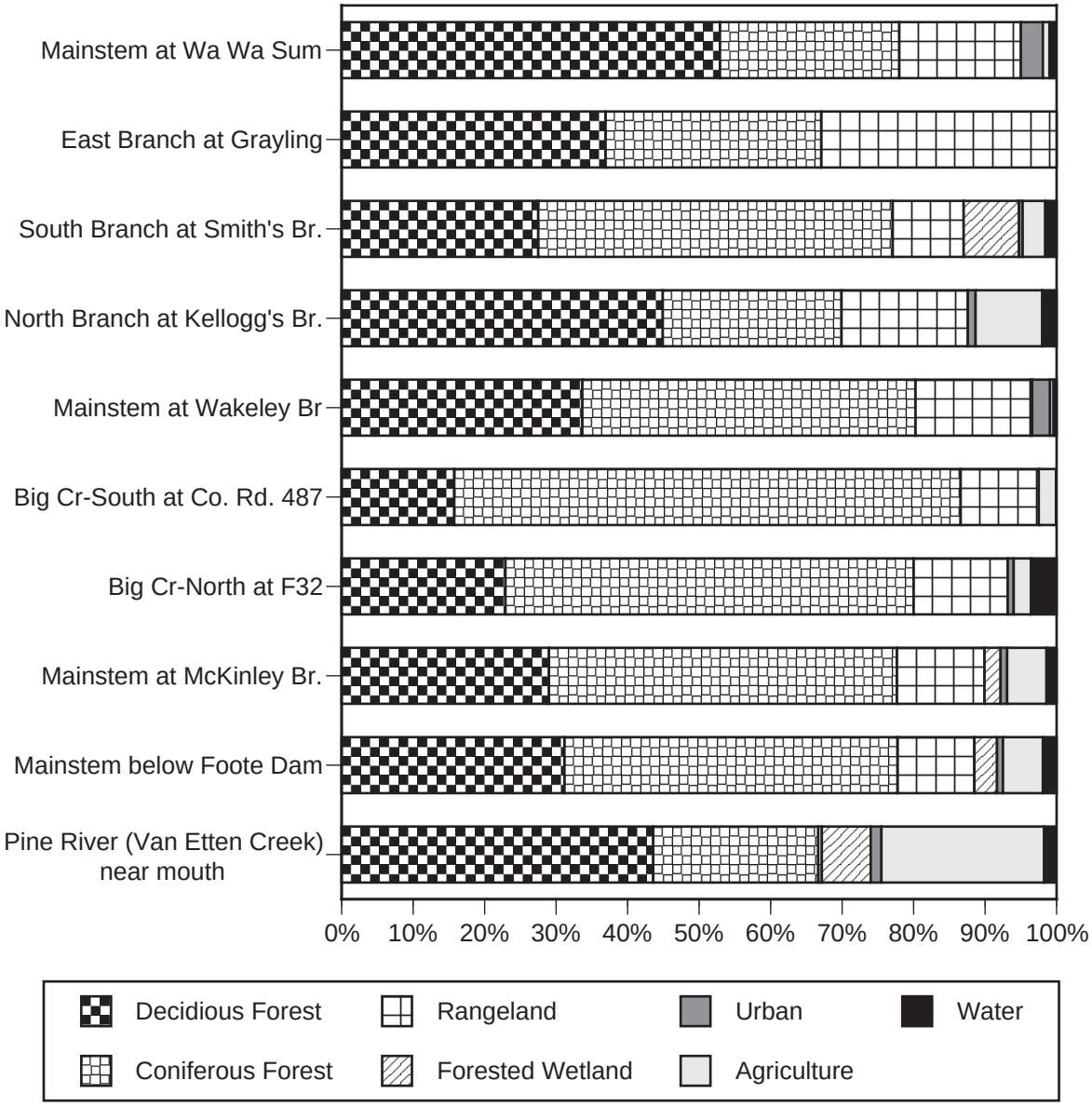


Figure 10.–Percent of different land use types for catchments of segments and tributaries of the Au Sable River. Data from Michigan Department of Natural Resources, Fisheries Division records.

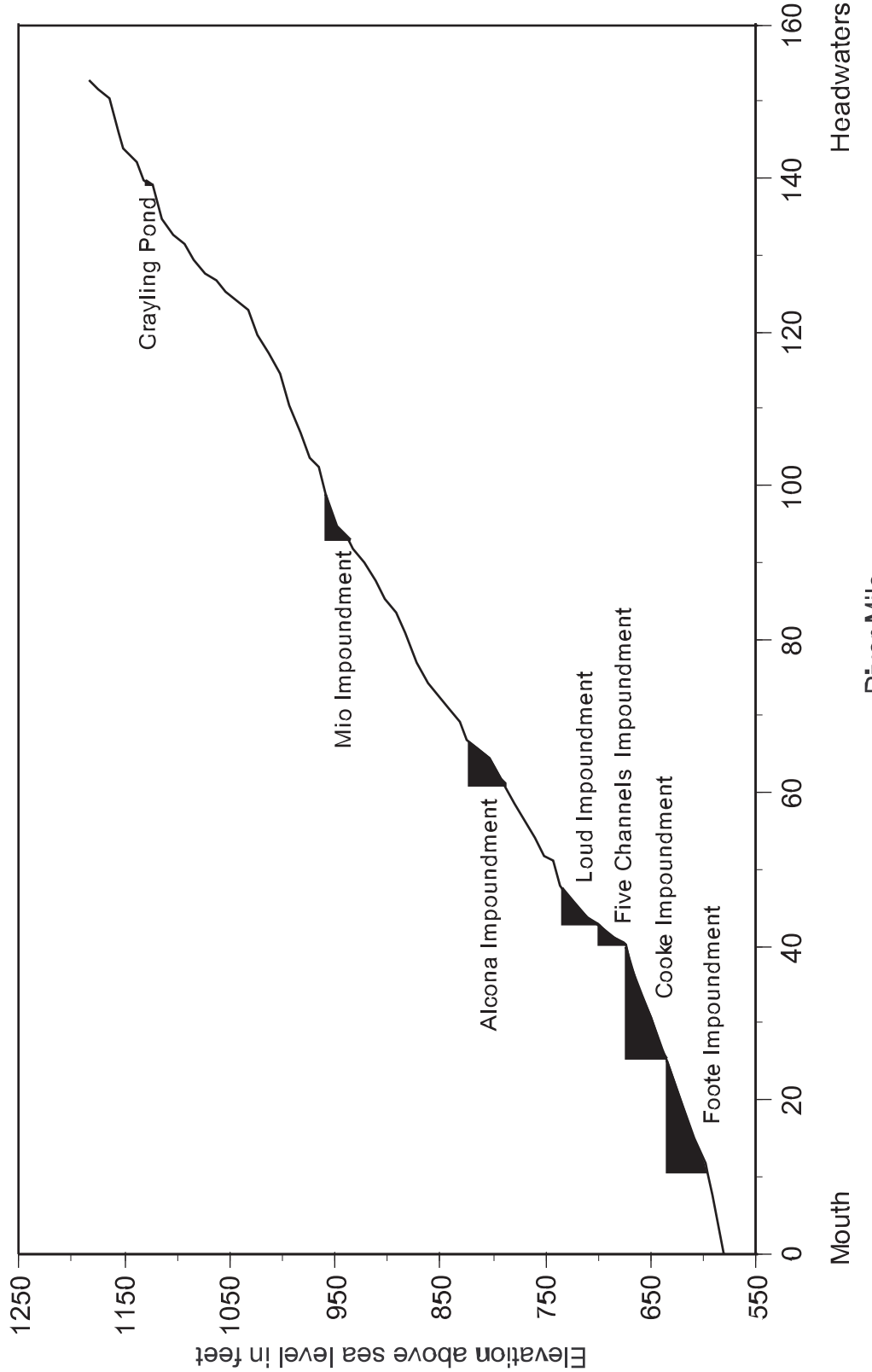


Figure 11.–Elevation changes by river mile along the mainstem Au Sable River from its headwaters at the confluence of Kolke and Bradford creeks to its mouth. Impoundments created by major mainstem dams are shown. Data from Michigan Department of Natural Resources, Fisheries Division records.

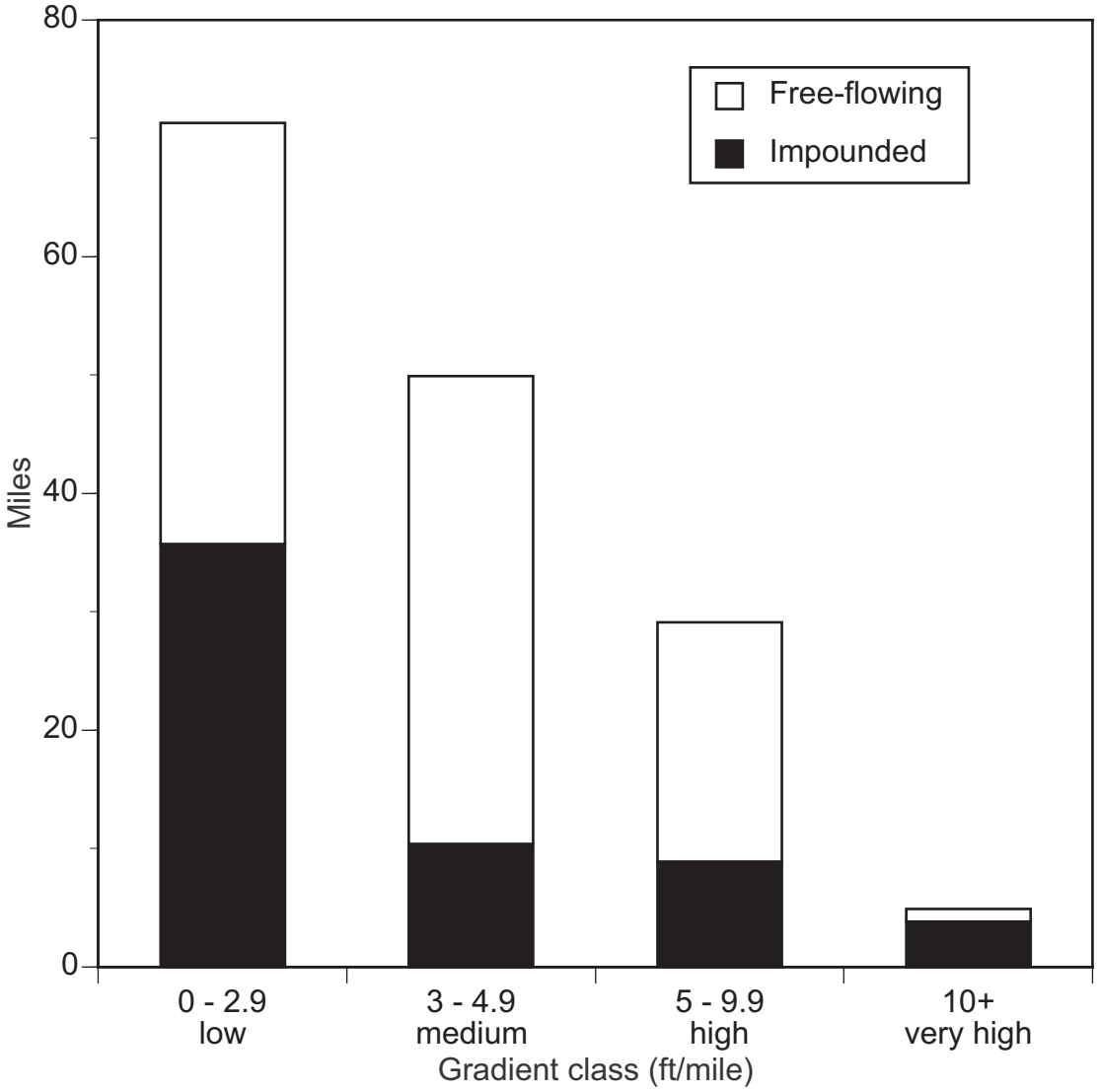


Figure 12.–Stream gradient distribution for the mainstem Au Sable River. Data from Michigan Department of Natural Resources, Fisheries Division records.

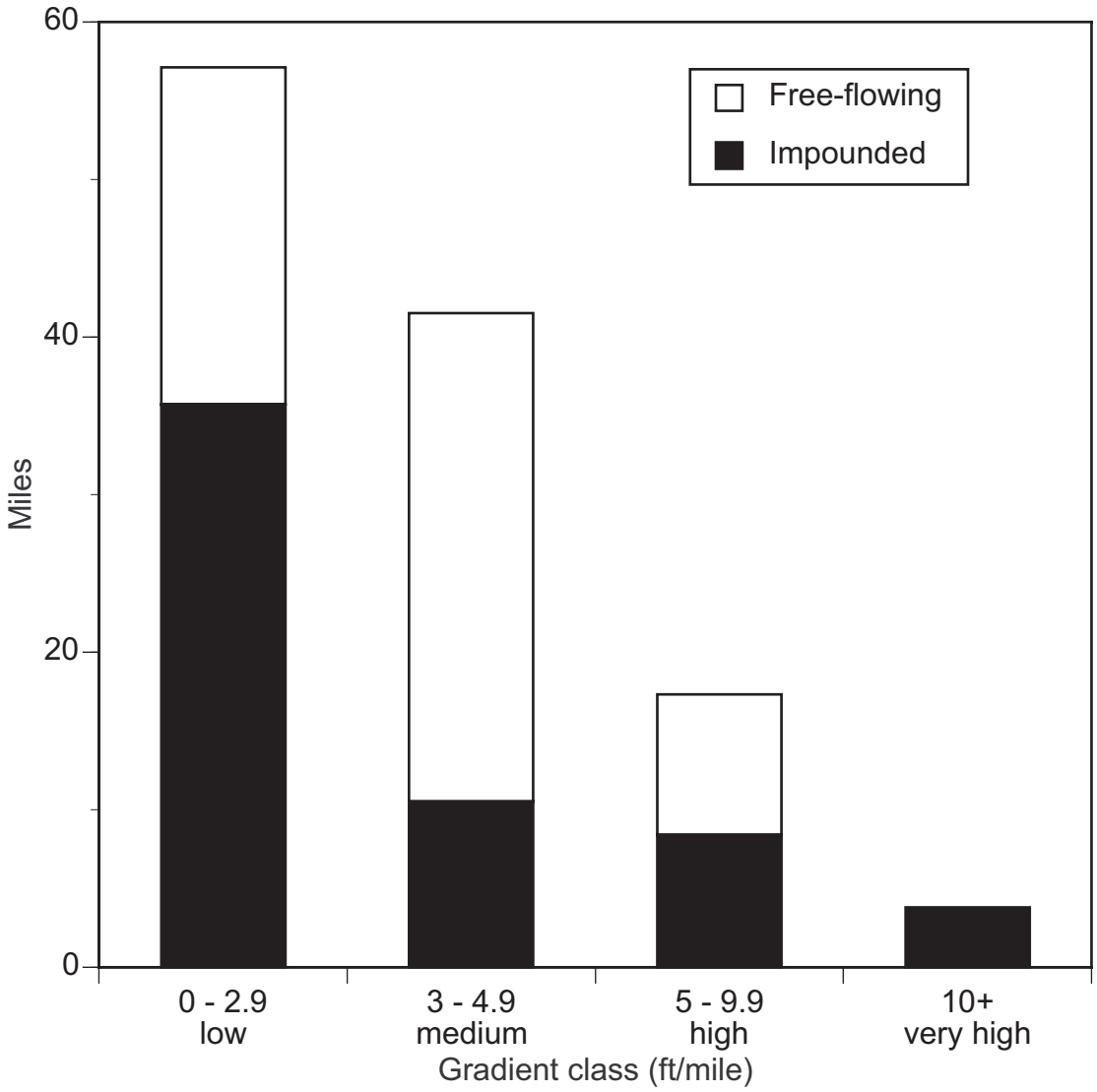


Figure 13.–Stream gradient distribution for the mainstem Au Sable River from the confluence of the South Branch Au Sable River to Lake Huron. Data from Michigan Department of Natural Resources, Fisheries Division records.

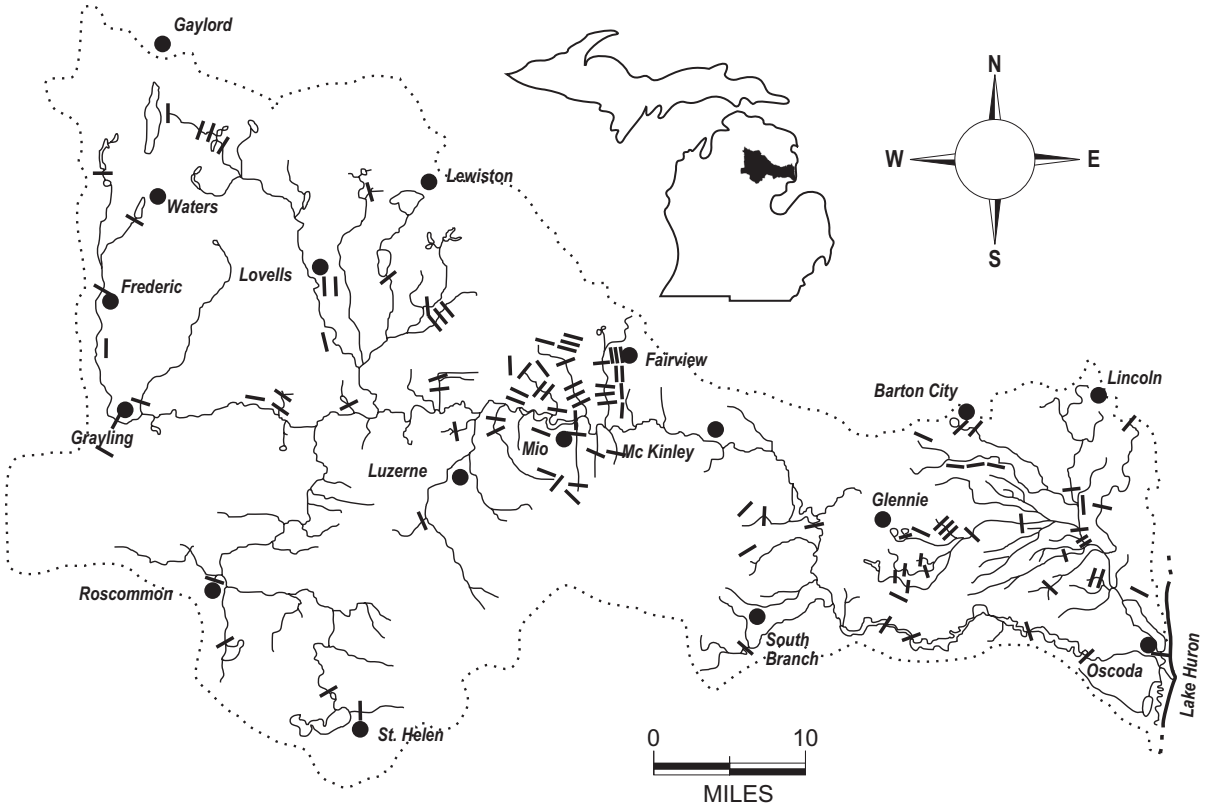


Figure 14.–Dams in the Au Sable River watershed. Data from Michigan Department of Environmental Quality, Land and Water Management Division.

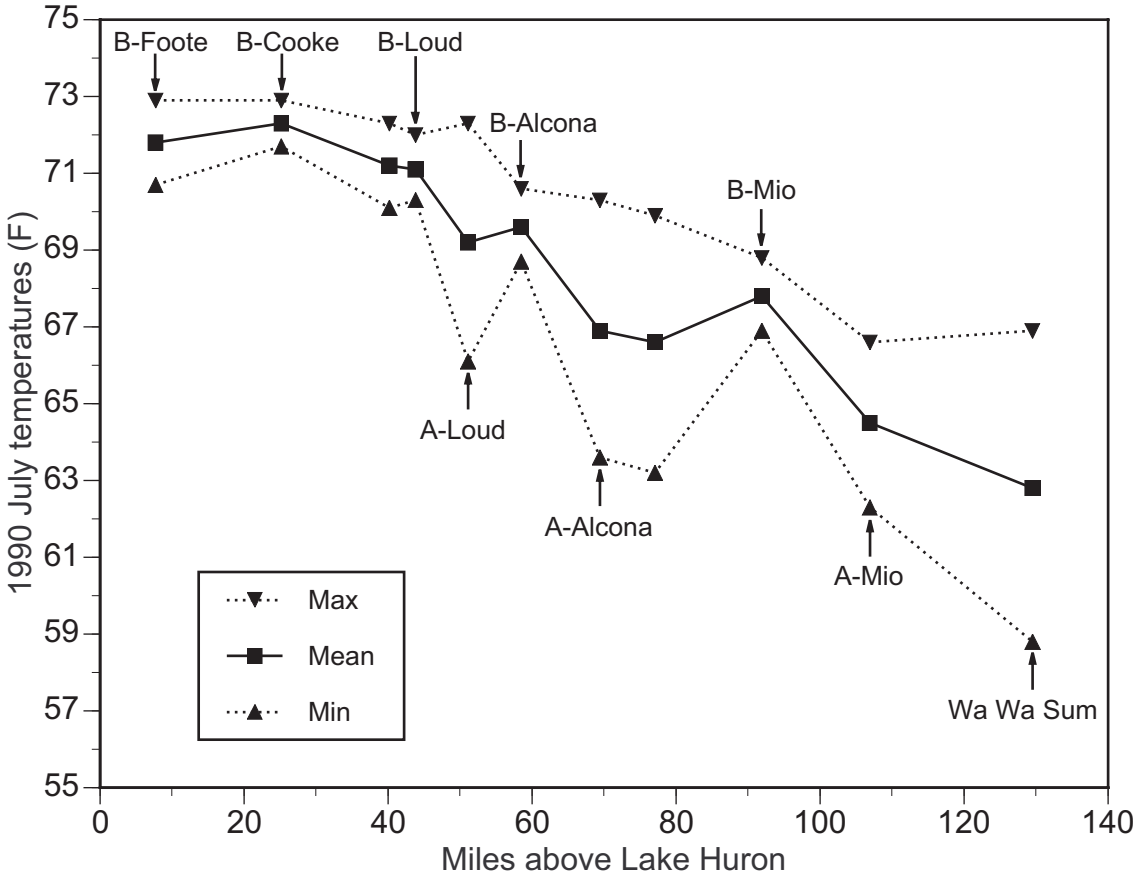


Figure 15.–Average weekly maximum, minimum, and mean stream temperatures in July 1990 for riverine (or tailwater) reaches of the Au Sable River above (A-) and below (B-) Consumers Energy ponds. Data show that ponds unnaturally elevate summer temperatures and reduce natural temperature variations. Data were not collected above Five Channels, Cooke, and Foote ponds due to absence of free-flowing river reaches directly upstream of each pond. Data from Michigan Department of Natural Resources, Fisheries Division records.

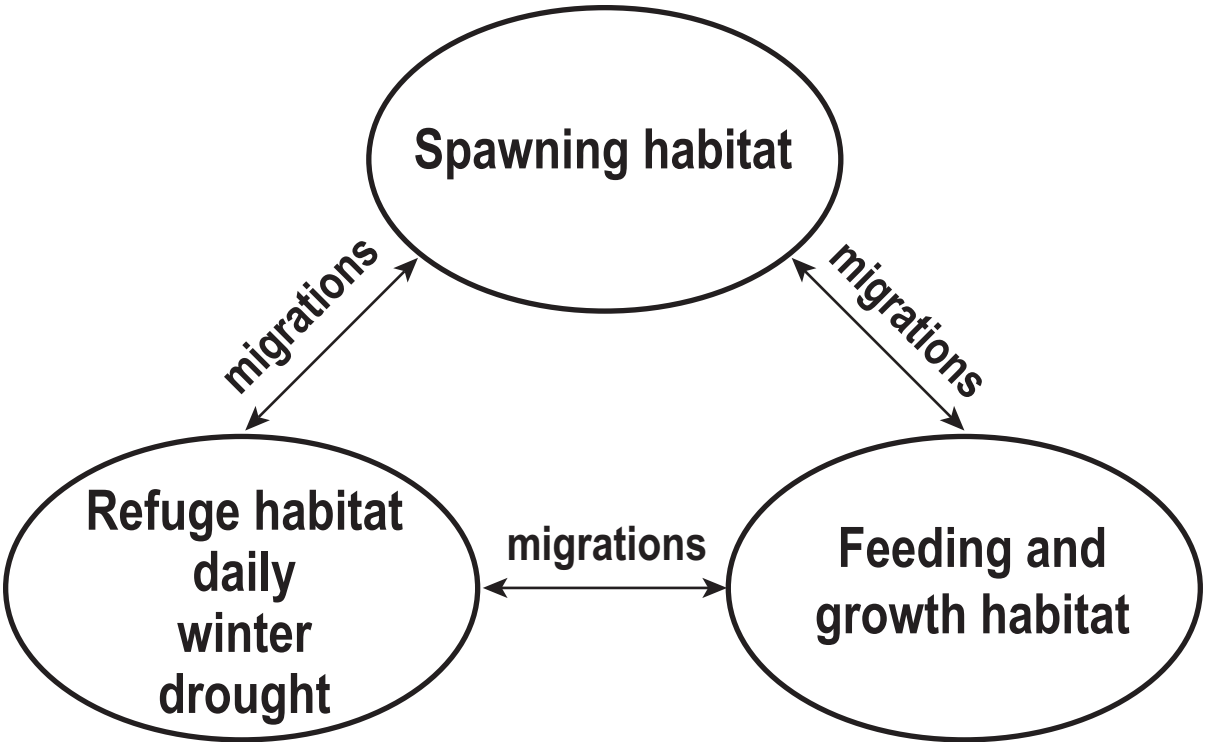


Figure 16.–The basic life cycle of stream fishes in regard to habitat use (modified from Schlosser 1991).

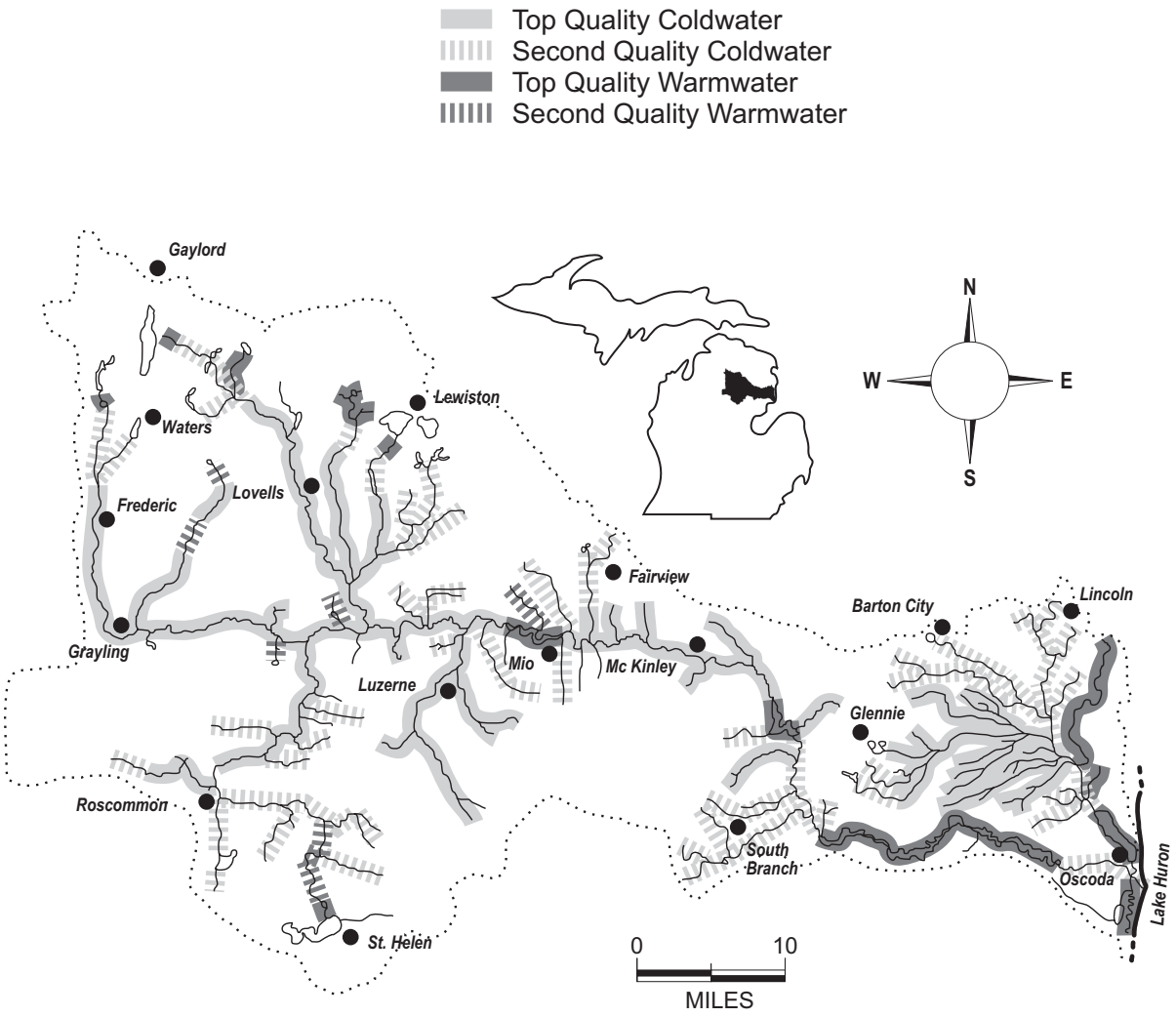


Figure 17.–Michigan Department of Natural Resources, Fisheries Division classification of the Au Sable River drainage in 1967. Top- and second-quality coldwater streams are designated trout streams. Data from Michigan Department of Natural Resources, Fisheries Division records.

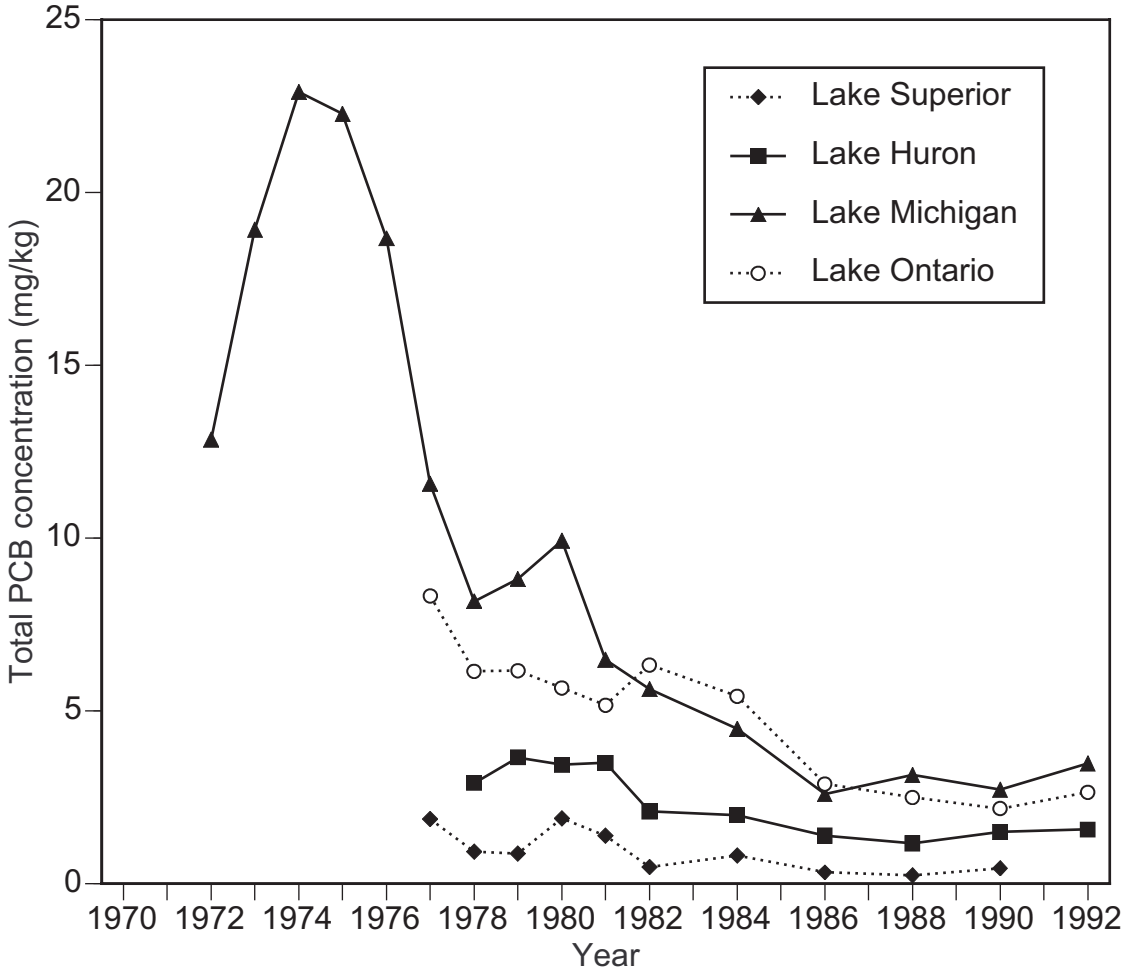


Figure 18.–Mean total PCB concentrations in whole lake trout from the Great Lakes, 1972-92. Data from De Vault et al. (1996).

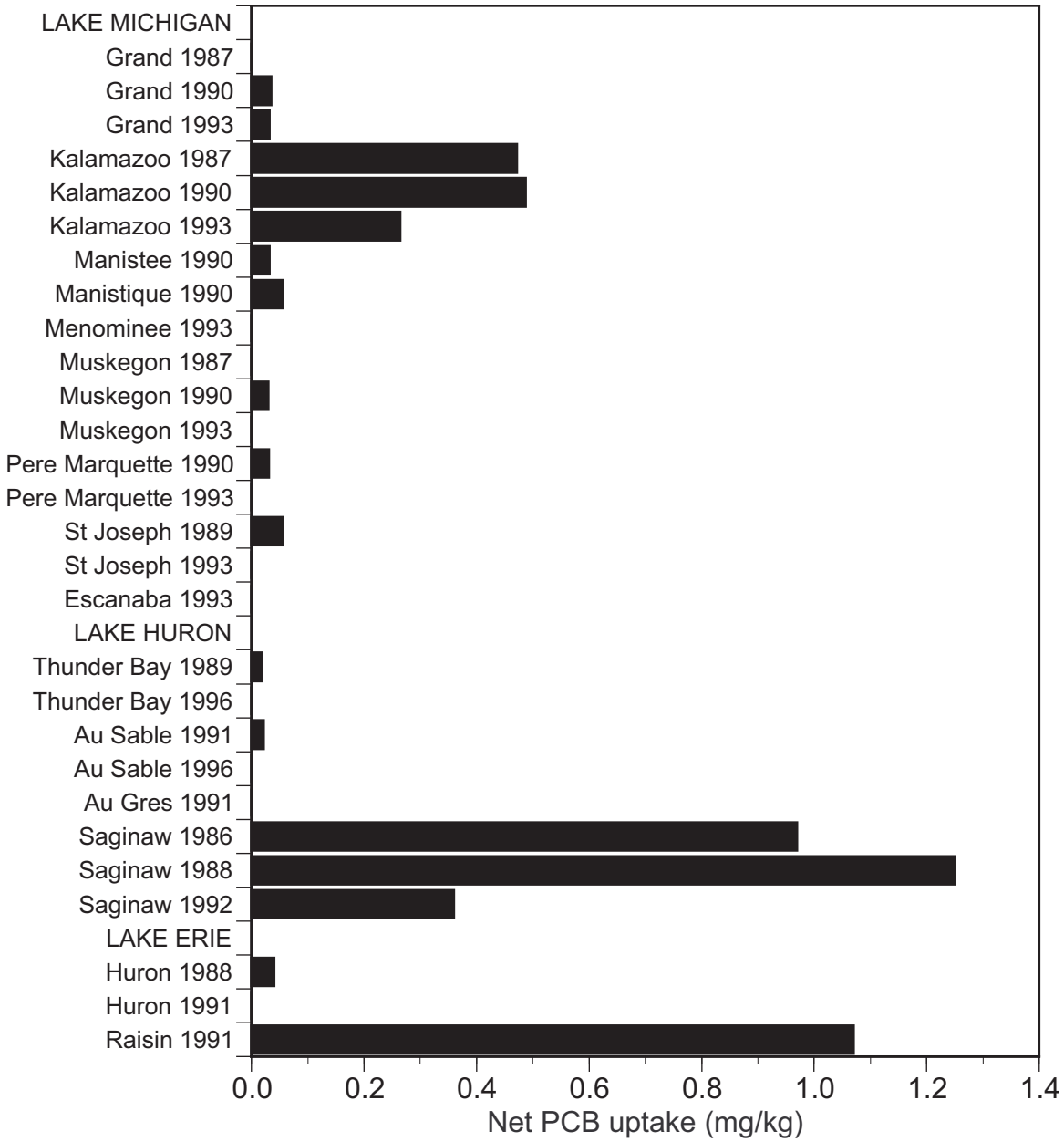


Figure 19.–Net uptake of PCBs in channel catfish caged for 27 to 29 days at the mouths of select Michigan rivers. Zero values indicate no detectable uptake. Data from Michigan Department of Environmental Quality, Surface Water Quality Division records.

Figure 20.–Mean total chlordane concentration in whole lake trout from the Great Lakes, 1986-92. Data from De Vault et al. (1996).

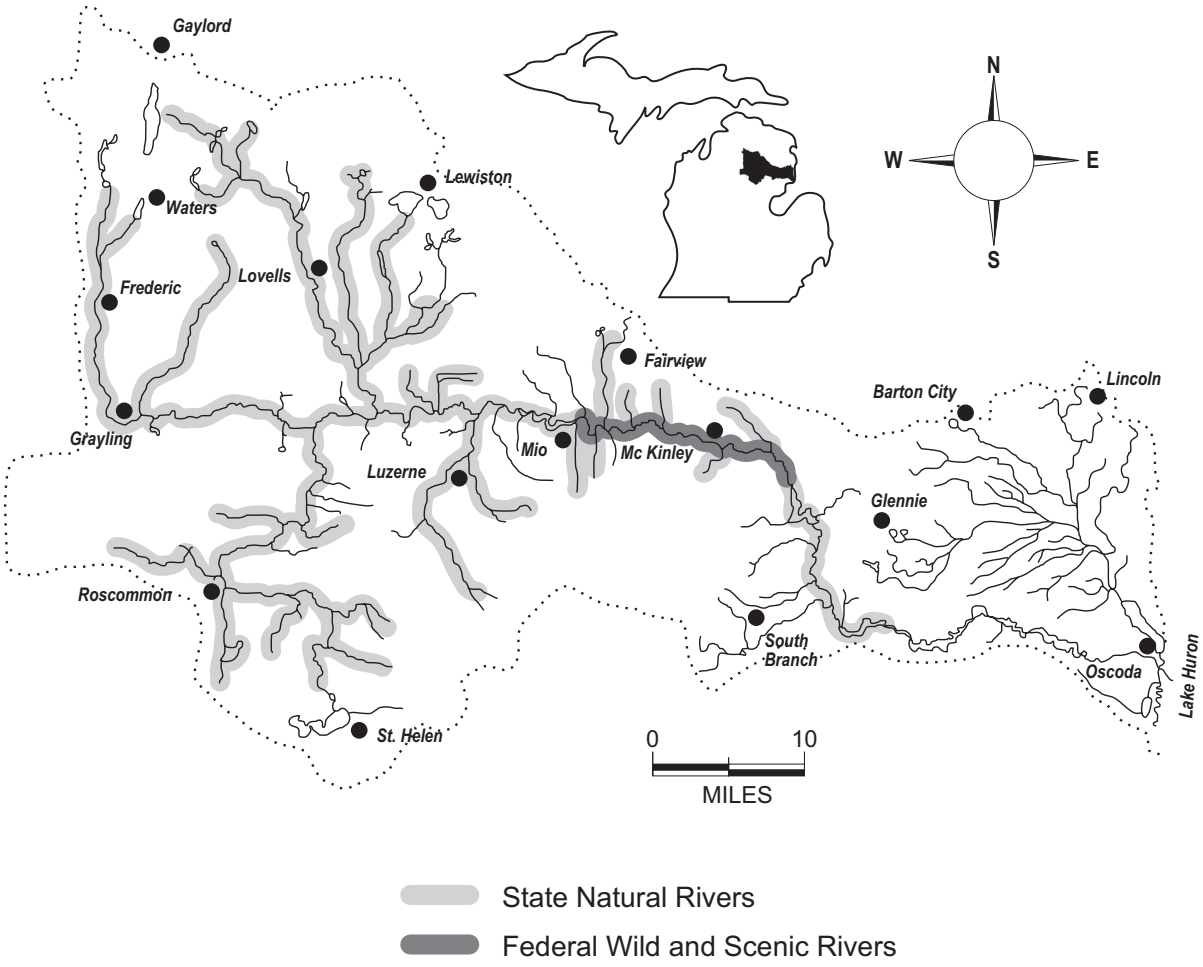


Figure 21.–State Natural Rivers and Federal Wild and Scenic Rivers in the Au Sable River watershed. The Federally designated portion is also designated as a State Natural River. Data from Anonymous (1987).

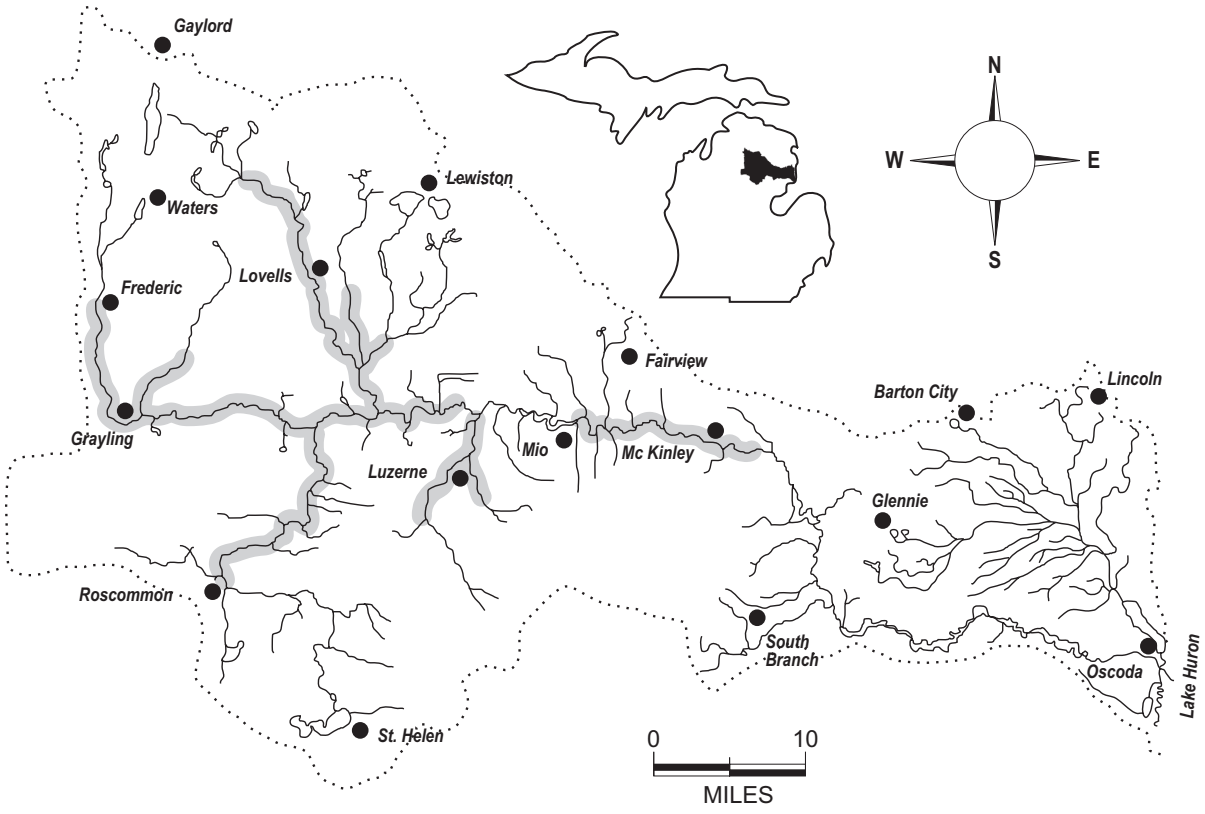


Figure 22.–Blue Ribbon trout streams in the Au Sable River watershed. Data from Michigan Department of Natural Resources, Fisheries Division records.

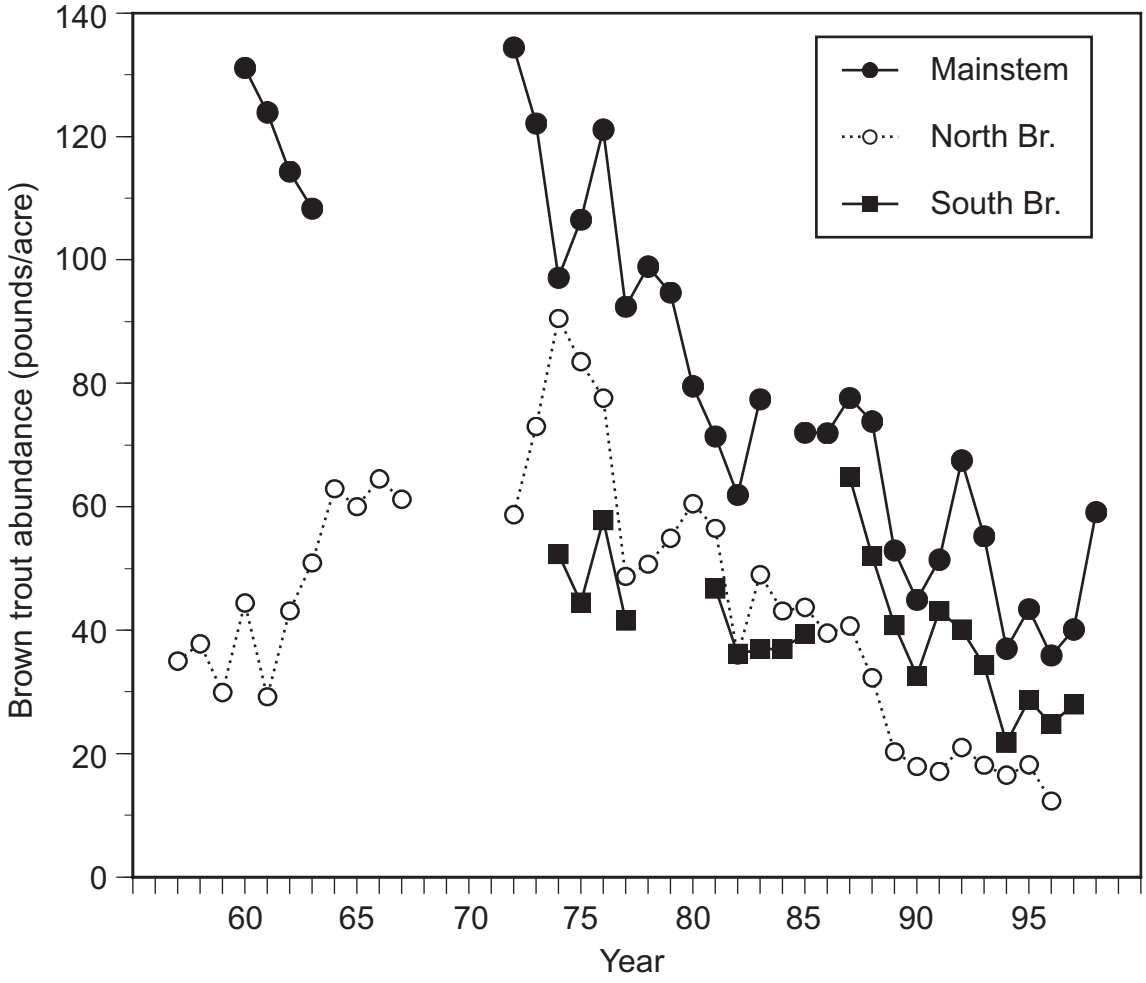


Figure 23.–Brown trout abundance for the mainstem, North and South branches of the Au Sable River, 1957-98. Data are averages for the following combinations of electrofishing sites: Mainstem-WaWaSum and Stephan's Bridge; North Branch- Twin Bridges and Dam Four; South Branch- Chase Bridge and Smith Bridge.

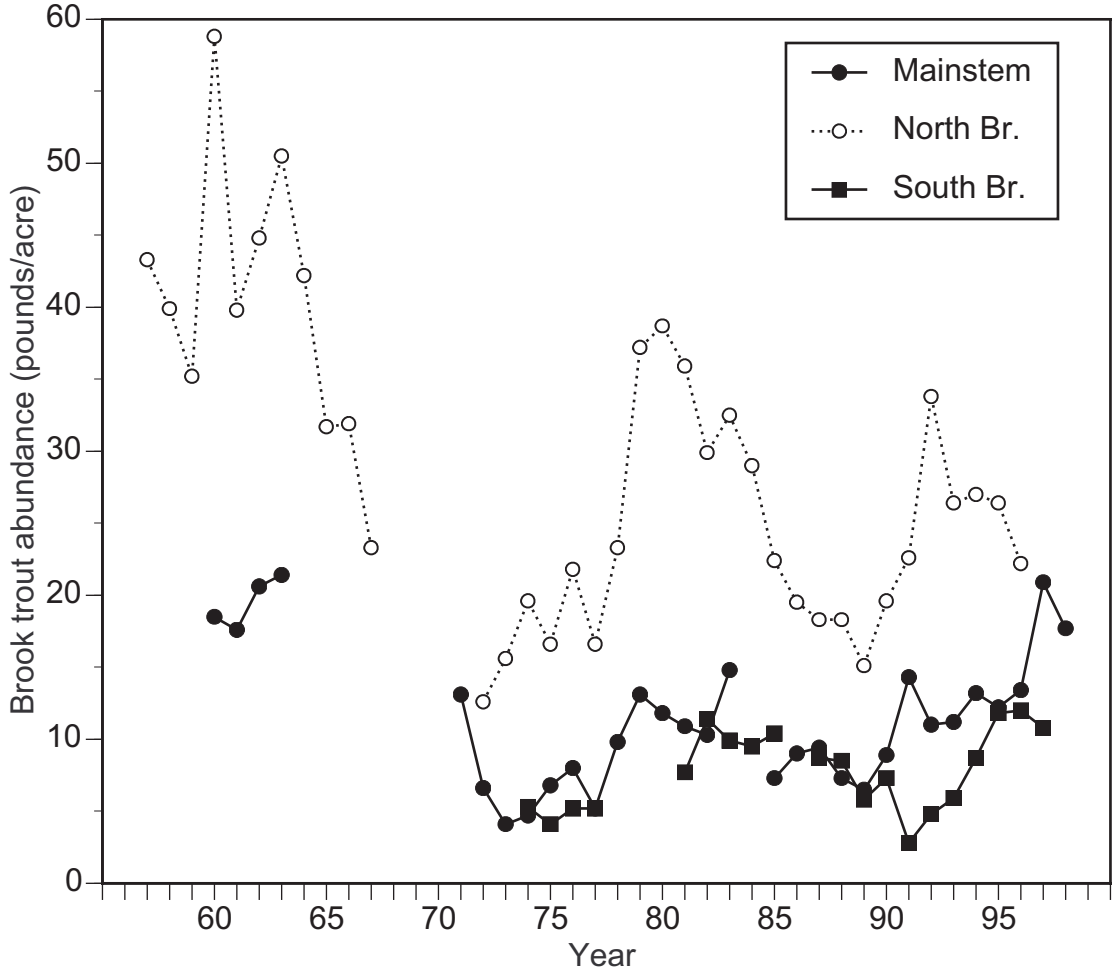


Figure 24.–Brook trout abundance for the mainstem, North and South branches of the Au Sable River, 1957-98. Data are averages for the following combinations of electrofishing sites: Mainstem- WaWaSum and Stephan's Bridge; North Branch- Twin Bridges and Dam Four; South Branch- Chase Bridge and Smith Bridge.

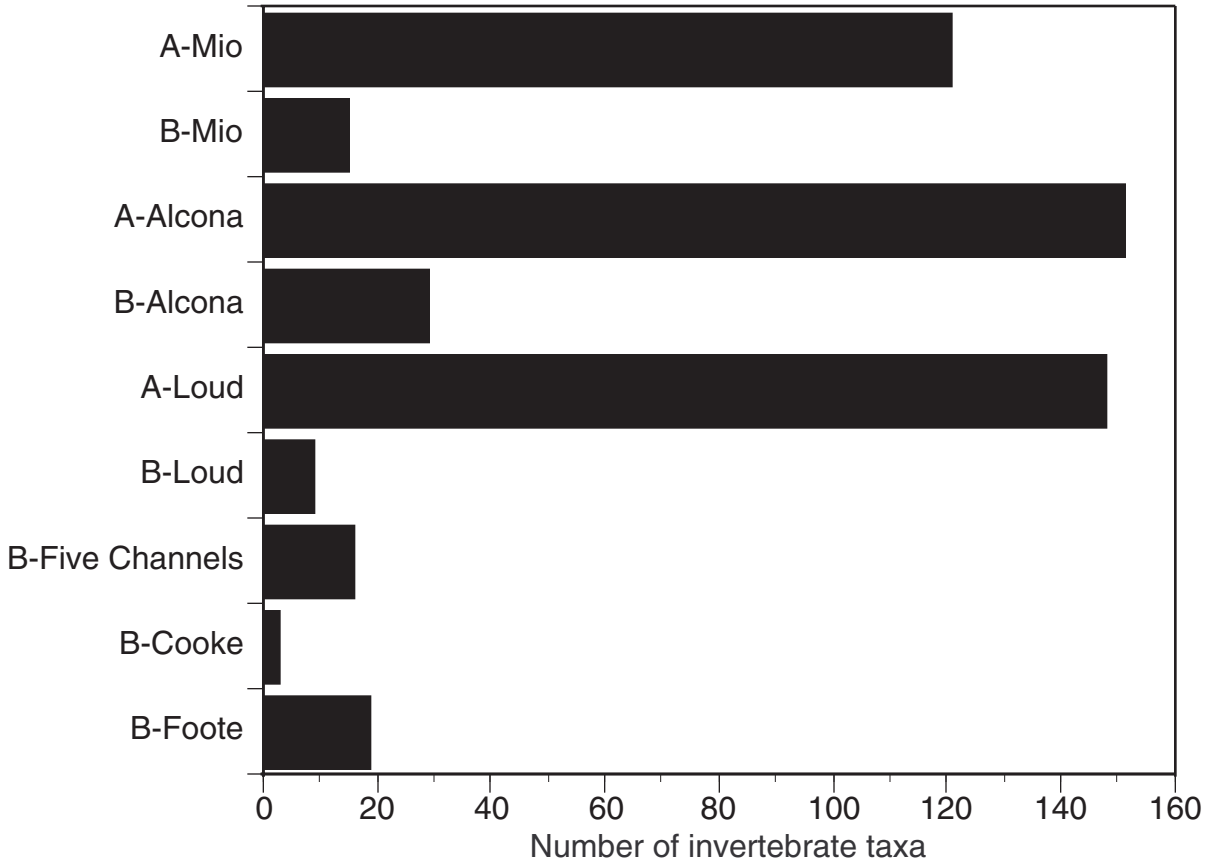


Figure 25.–Number of invertebrate taxa collected in riverine reaches of the Au Sable River above (A-) and below (B-) Consumers Energy ponds. "Taxa" were usually identified to the species level, but in some cases, only to the genus level; the level of identification (genus vs. species) was consistent across collections. Data were not collected above Five Channels, Cooke, and Foote ponds due to absence of free-flowing river reaches directly upstream of each pond. Data from Lawler, Matusky, and Skelly Engineers (1991 a, b, c, d, e, f).

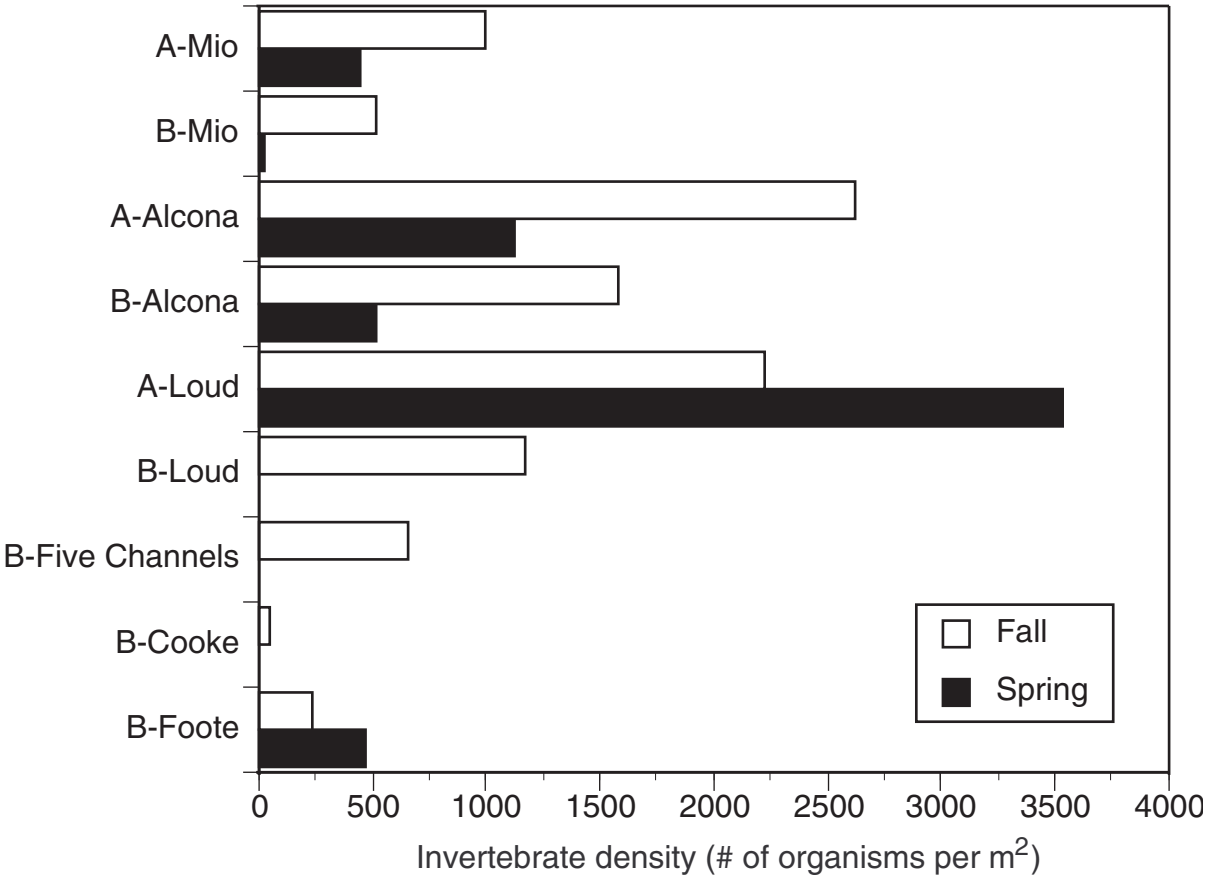


Figure 26.–Spring and fall densities of aquatic invertebrates on cobble and boulder substrates in riverine reaches of the Au Sable River above (A-) and below (B-) Consumers Energy ponds. No spring data were available below Loud, Five Channels, and Cooke Ponds. Data were not collected above Five Channels, Cooke, and Foote ponds due to absence of free-flowing river reaches directly upstream of each pond. Data from Lawler, Matusky, and Skelly Engineers (1991 a, b, c, d, e, f).

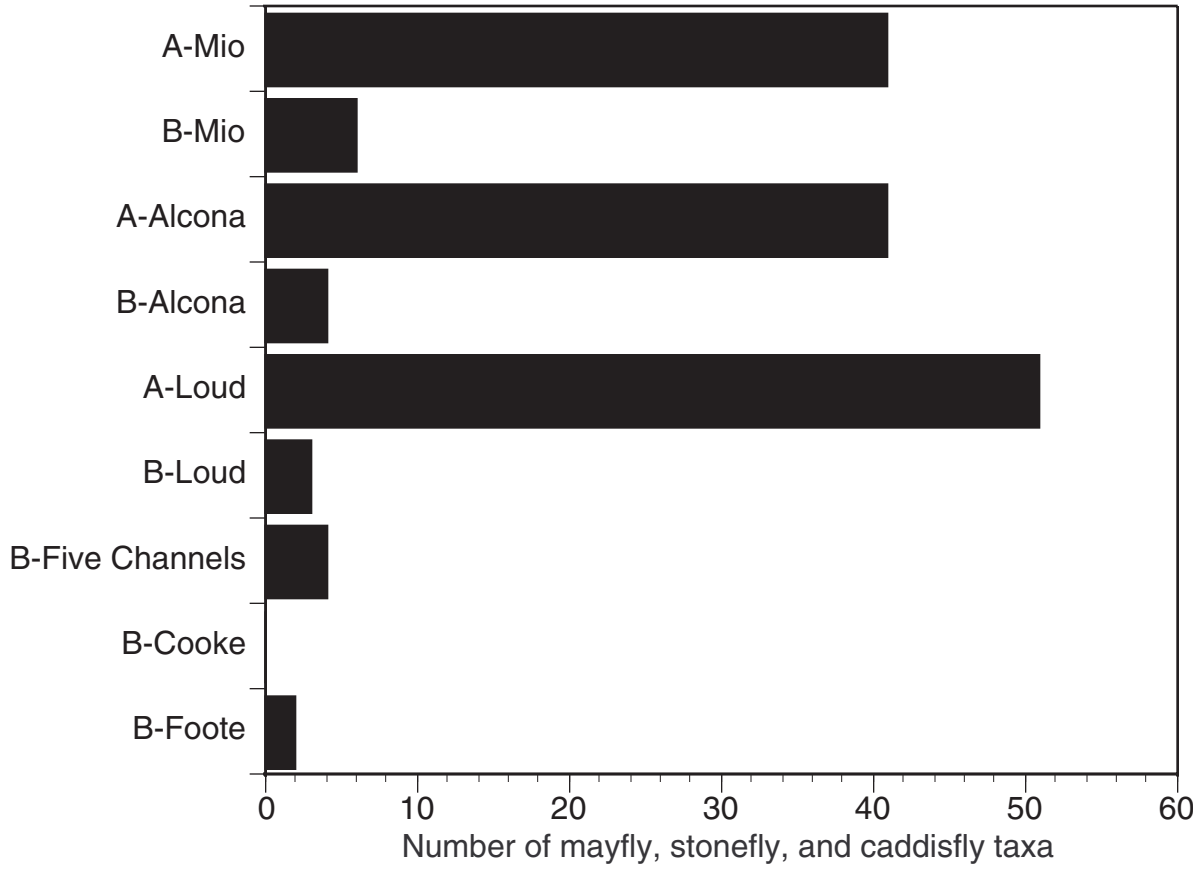


Figure 27.–Number of mayfly, stonefly, and caddisfly taxa collected in riverine reaches of the Au Sable River above (A-) and below (B-) Consumers Energy ponds. "Taxa" were usually identified to the species level, but in some cases, only to the genus level; the level of identification (genus vs. species) was consistent across collections. Data were not collected above Five Channels, Cooke, and Foote ponds due to absence of free-flowing river reaches directly upstream of each pond. Data from Lawler, Matusky, and Skelly Engineers (1991 a, b, c, d, e, f).

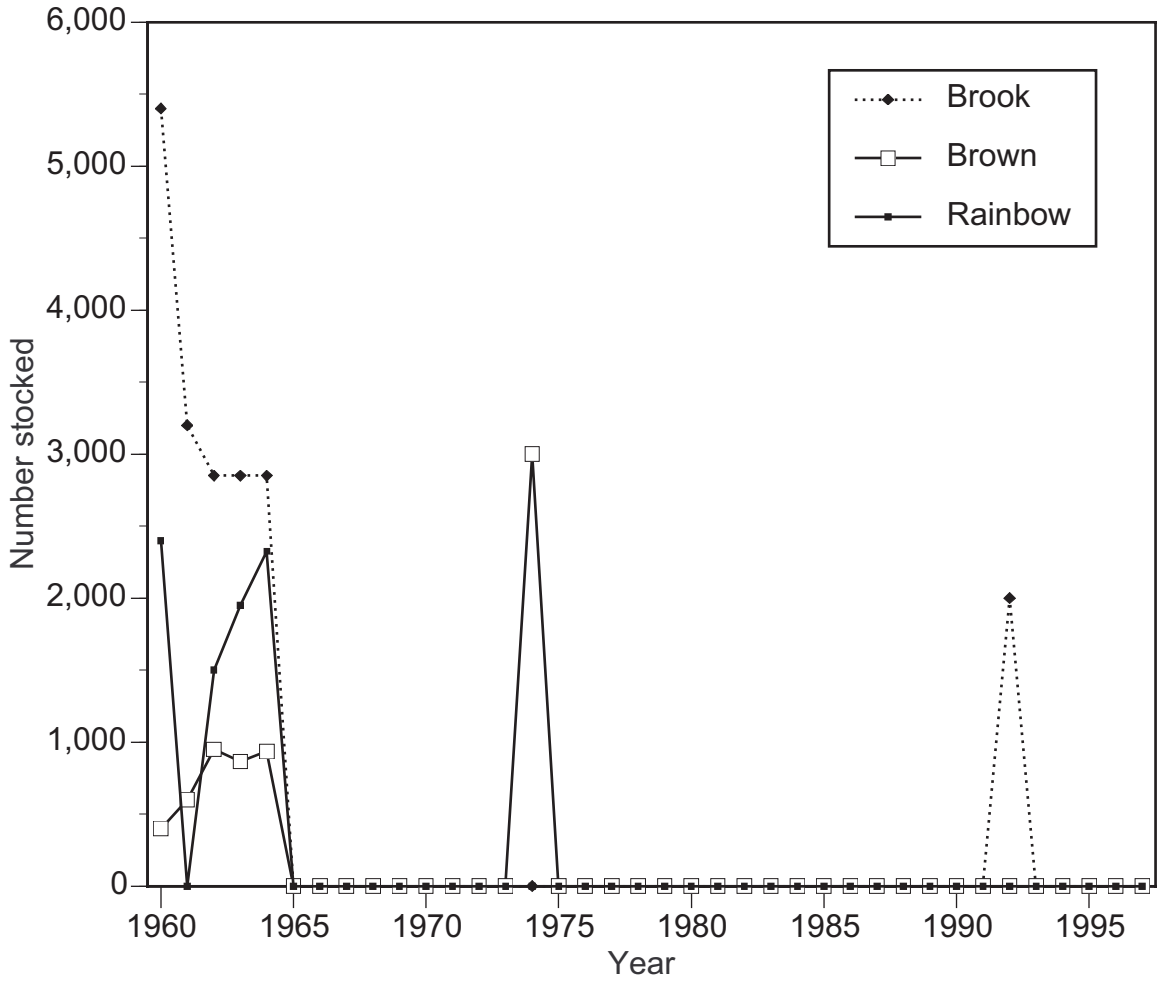


Figure 28.–Brook, brown, and rainbow trout stockings in the Headwaters to Wakeley Bridge segment of the Au Sable River, 1960-97. Data from Michigan Department of Natural Resources, Fisheries Division records.

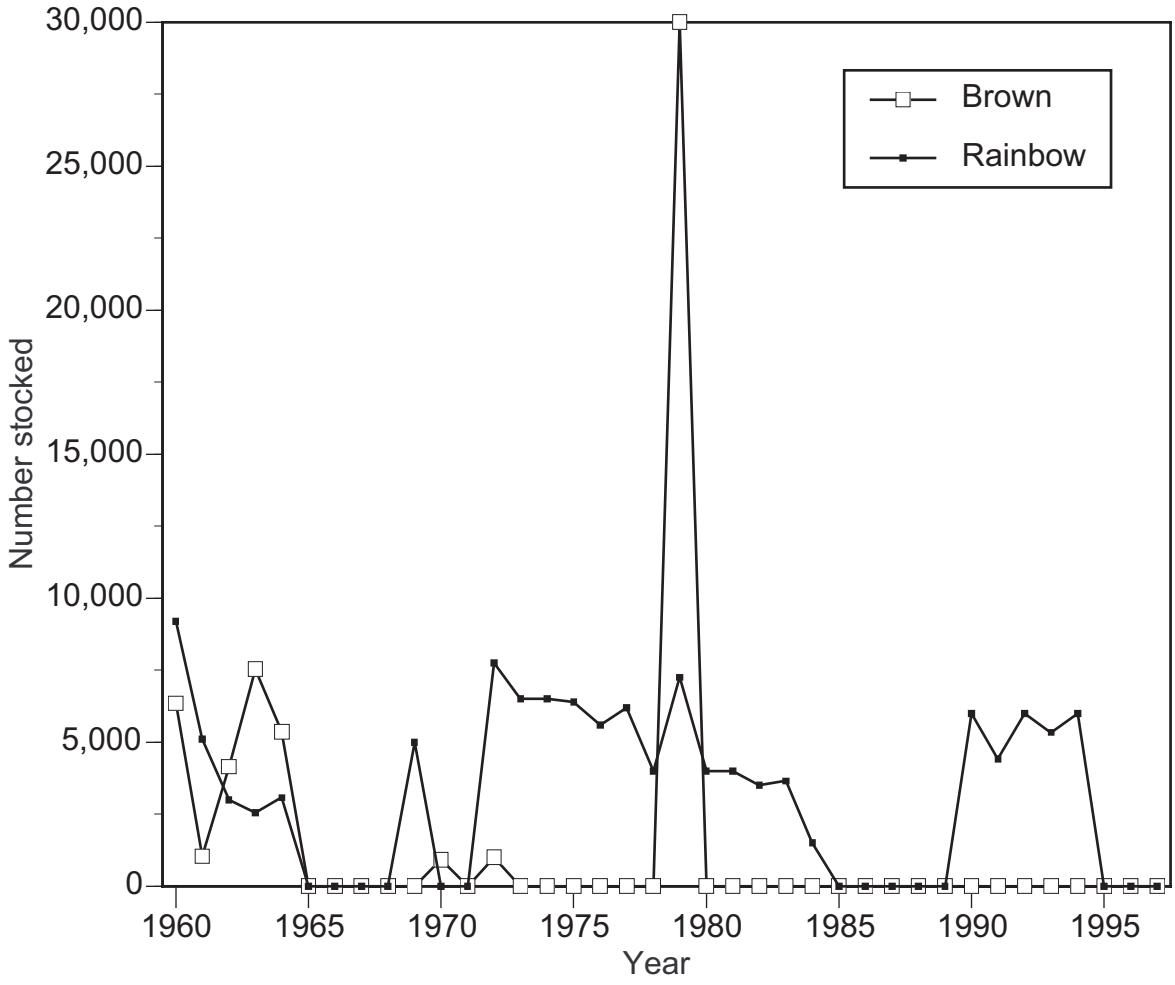


Figure 29.–Brown and rainbow trout stockings in the Wakeley Bridge to Mio Pond segment of the Au Sable River, 1960-97. Data from Michigan Department of Natural Resources, Fisheries Division records.

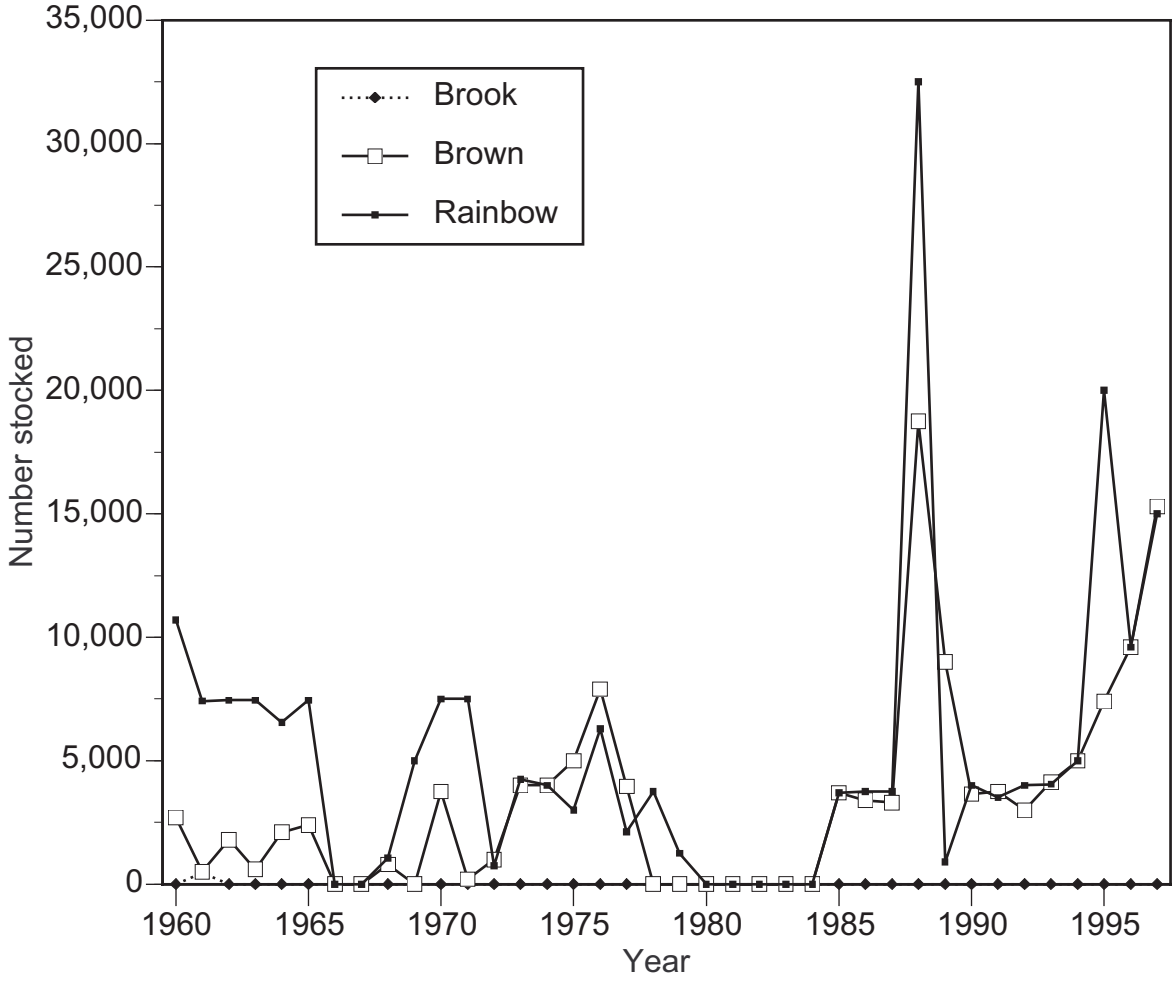


Figure 30.–Brook, brown, and rainbow trout stockings in the Mio Pond to McKinley Bridge segment of the Au Sable River, 1960-97. Data from Michigan Department of Natural Resources, Fisheries Division records.

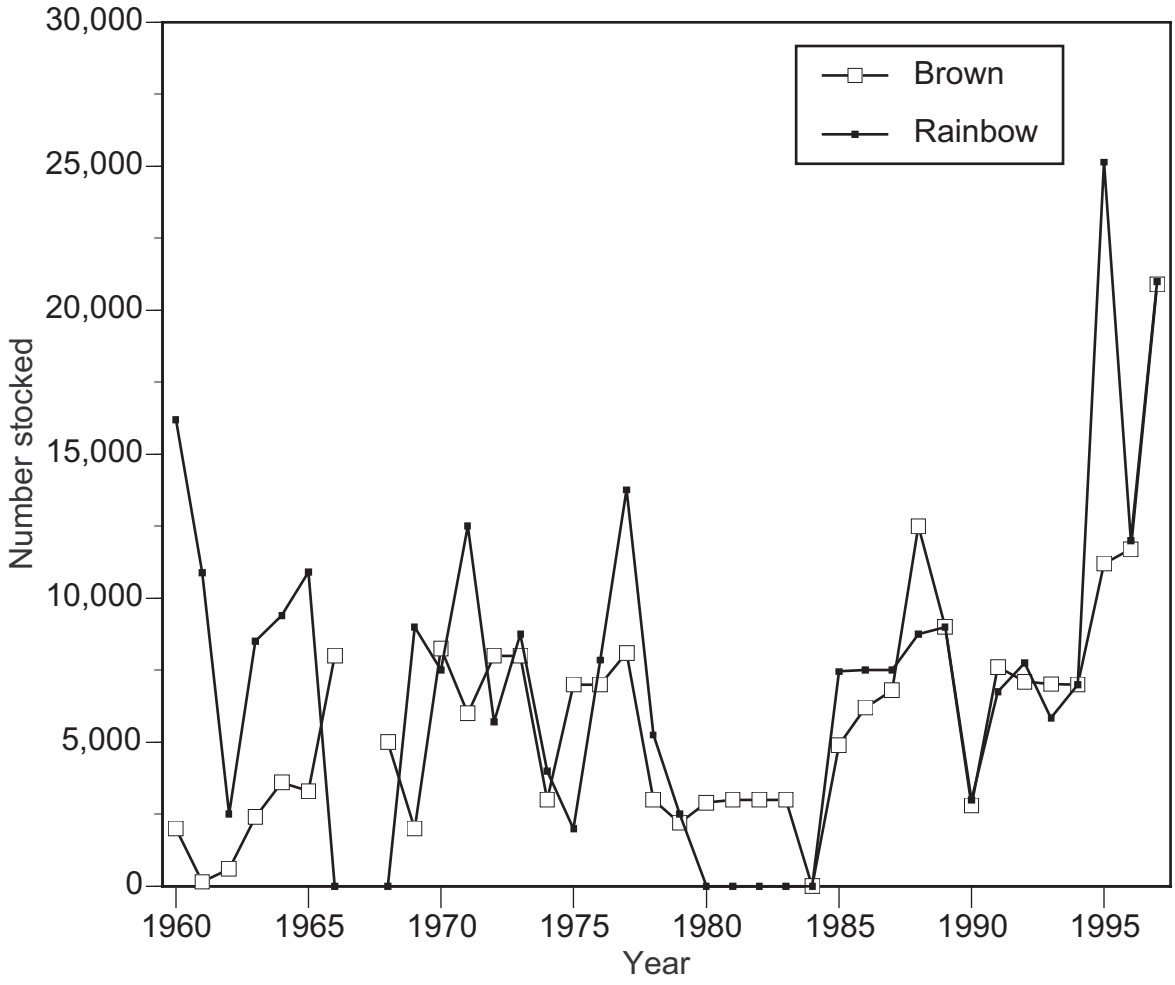


Figure 31.–Brown and rainbow trout stockings in the McKinley Bridge to Five Channels Dam segment of the Au Sable River, 1960-97. Data from Michigan Department of Natural Resources, Fisheries Division records.

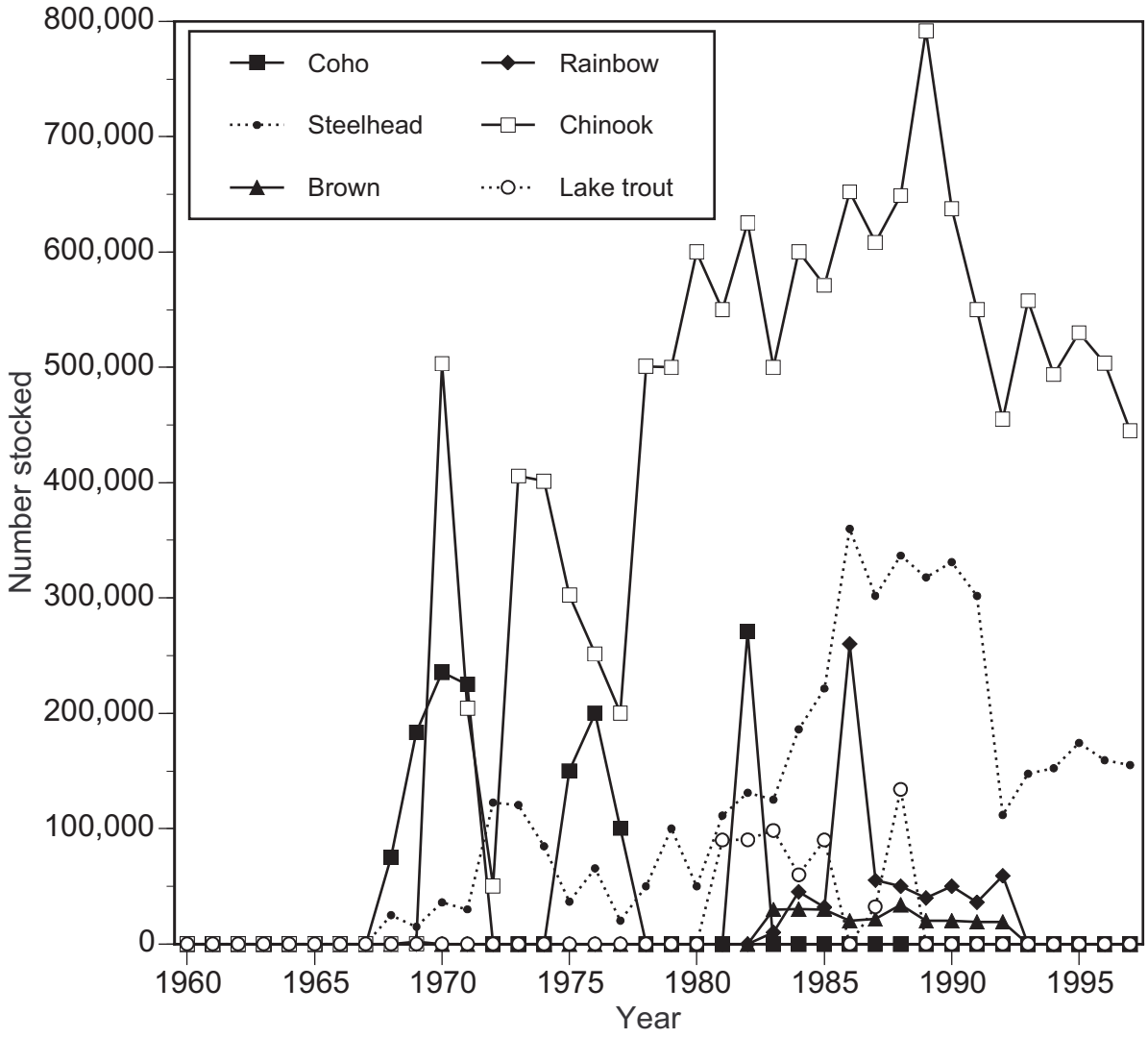


Figure 32.–Salmonid stockings in the Foote Dam to Lake Huron segment of the Au Sable River, 1960-97. Not shown are 9,000 Atlantic salmon that were stocked in 1972. Data from Michigan Department of Natural Resources, Fisheries Division records.

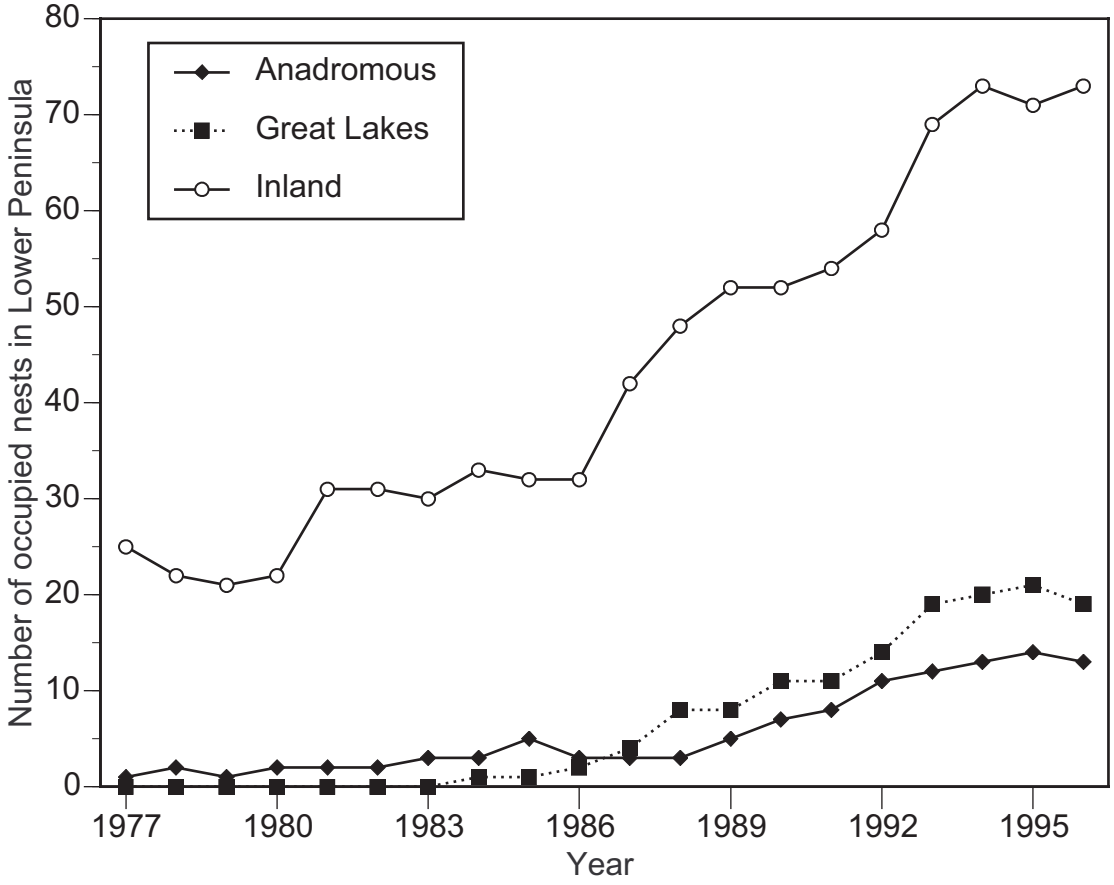


Figure 33.–Number of occupied bald eagle nests in Michigan's Lower Peninsula by nest category, 1977-96. Data from Michigan Department of Natural Resources, Wildlife Division records.

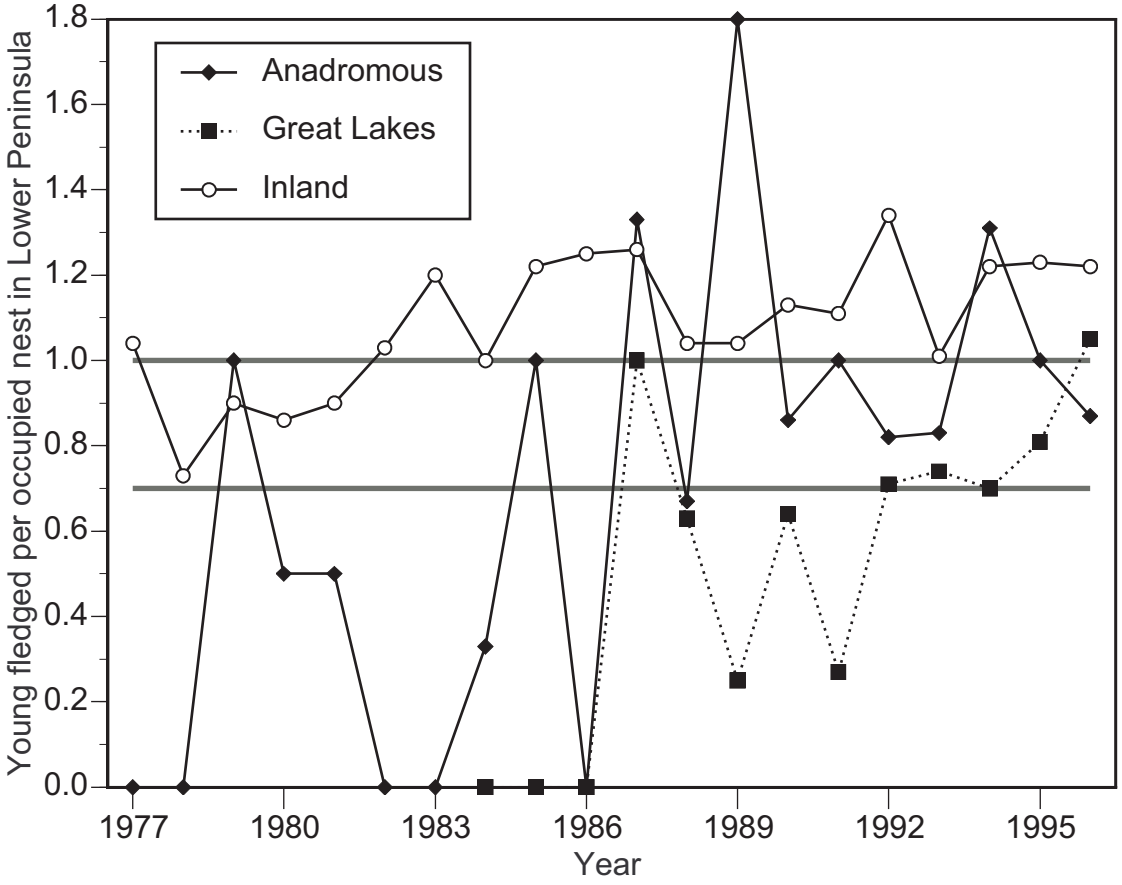


Figure 34.–Productivity of bald eagle nests in Michigan's Lower Peninsula by nest category, 1977-96. Horizontal lines at productivity values of 0.7 and 1.0 young fledged per occupied nest represent production levels of "stable" and "healthy" populations (Sprunt et al. 1973). Data from Michigan Department of Natural Resources, Wildlife Division records.

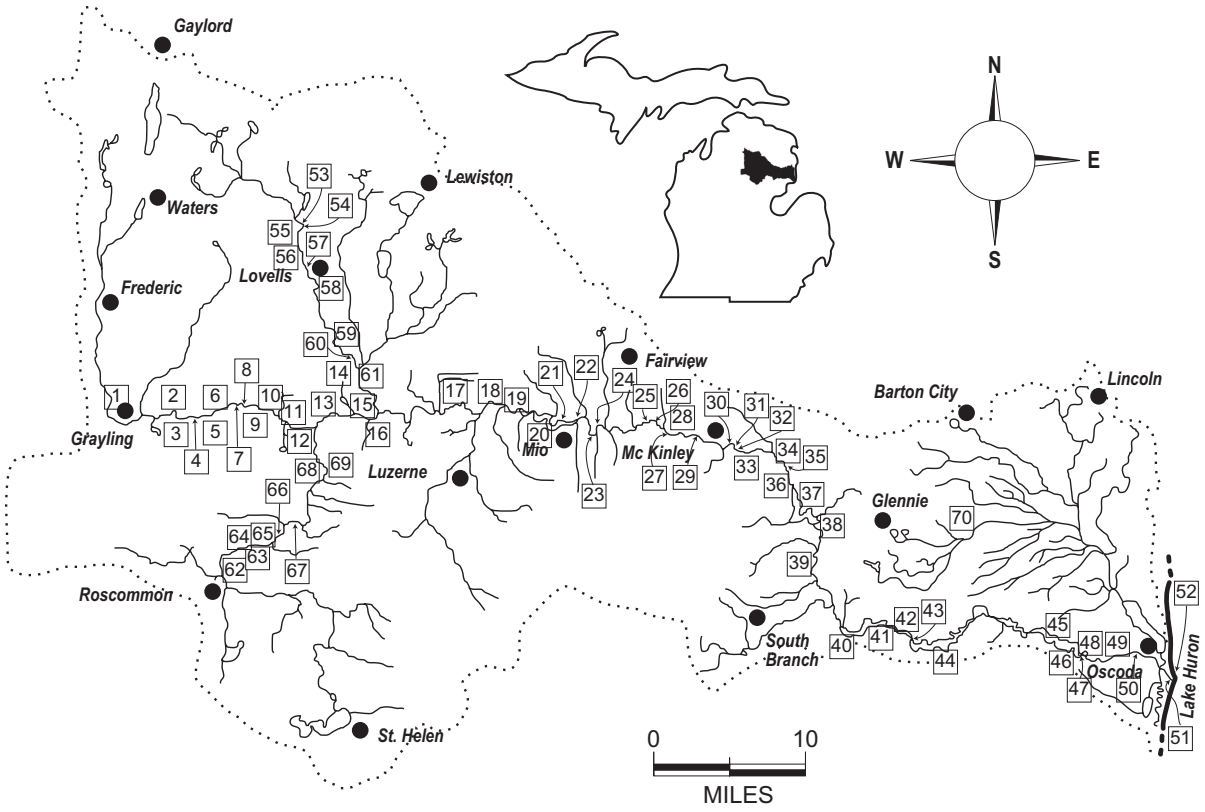


Figure 35.–Designated public access sites along the Au Sable River and its tributaries. Data from Michigan Department of Natural Resources and United States Forest Service records. Listed on the following page, access sites are categorized using font types as follows: regular = walk in access; regular, italics = walk in access and campground; bold = boat ramp; bold, italics = boat ramp and campground.

Mainstem Au Sable River

1. Grayling City Park
2. *Au Sable River Canoe Camp*
3. **Burton's Landing**
4. **Louis Cabin Landing**
5. ***Keystone Landing***
6. Whirlpool Road
7. Thendara Road
8. Guide's Rest
9. **Stephan Bridge**
10. Pine Road
11. **Wakeley Bridge**
12. Townline Road
13. *White Pine State Forest Campground*
14. **Conners Flat**
15. *Rainbow Bend State Forest Campground*
16. **McMasters Bridge**
17. ***Parmalee Bridge State Forest Campground***
18. **Whirlpool Road**
19. **Camp Ten Bridge**
20. **Oscoda County Park**
21. ***Popps Road*** (Mio Pond)
22. **M33(M-72)**
23. *Loud Rest*
24. *River Dune*
25. *Meadow Springs*
26. **Comins Flats**
27. *Cathedral Pines*
28. Davis Landing
29. *McKinley Trail Camp*
30. **McKinley Bridge**
31. *Butter Cup*
32. *Bear Island*
33. **Alcona Rest Stop**
34. *Gabions*
35. **4001 Road Bridge**
36. *Alcona Pond Primitive Campsites*
37. ***Alcona County Park***
38. Bamfield Road
39. *Au Sable River Semi-Primitive Area South Alcona to Loud Campsites*
40. *Loud Pond Primitive Campsites*
41. **Loud Dam**
42. *Five Channel Pond Primitive Campsites*
43. **Five Channels Pond**
44. ***Cooke Pond Semi-Primitive Campsites***
45. *Foote Pond Primitive Campsites*
46. ***Old Orchard Park***
47. Foote Dam
48. **Rea Road Bridge**
49. *Lower Au Sable River Primitive Sites-Foote to Whirlpool*
50. **Whirlpool**
51. **Au Sable Township Ramp**
52. **Oscoda Public Access**

North Branch Au Sable River

53. Sheep Ranch
54. Twin Bridges
55. State Access 1
56. State Access 2
57. Lovells Bridge (County Road 612)
58. Dam 4
59. Sheep Pasture
60. Kellogg's Bridge
61. Morley Road

South Branch Au Sable River

62. **Mead's Landing**
63. Dearheart Valley Road
64. **Chase Bridge**
65. Durant's Castle
66. Lower High Banks
67. Chapel
68. *Canoe Harbor State Forest Campground*
69. **Smith Bridge**

Pine River

70. *Pine River Campground*