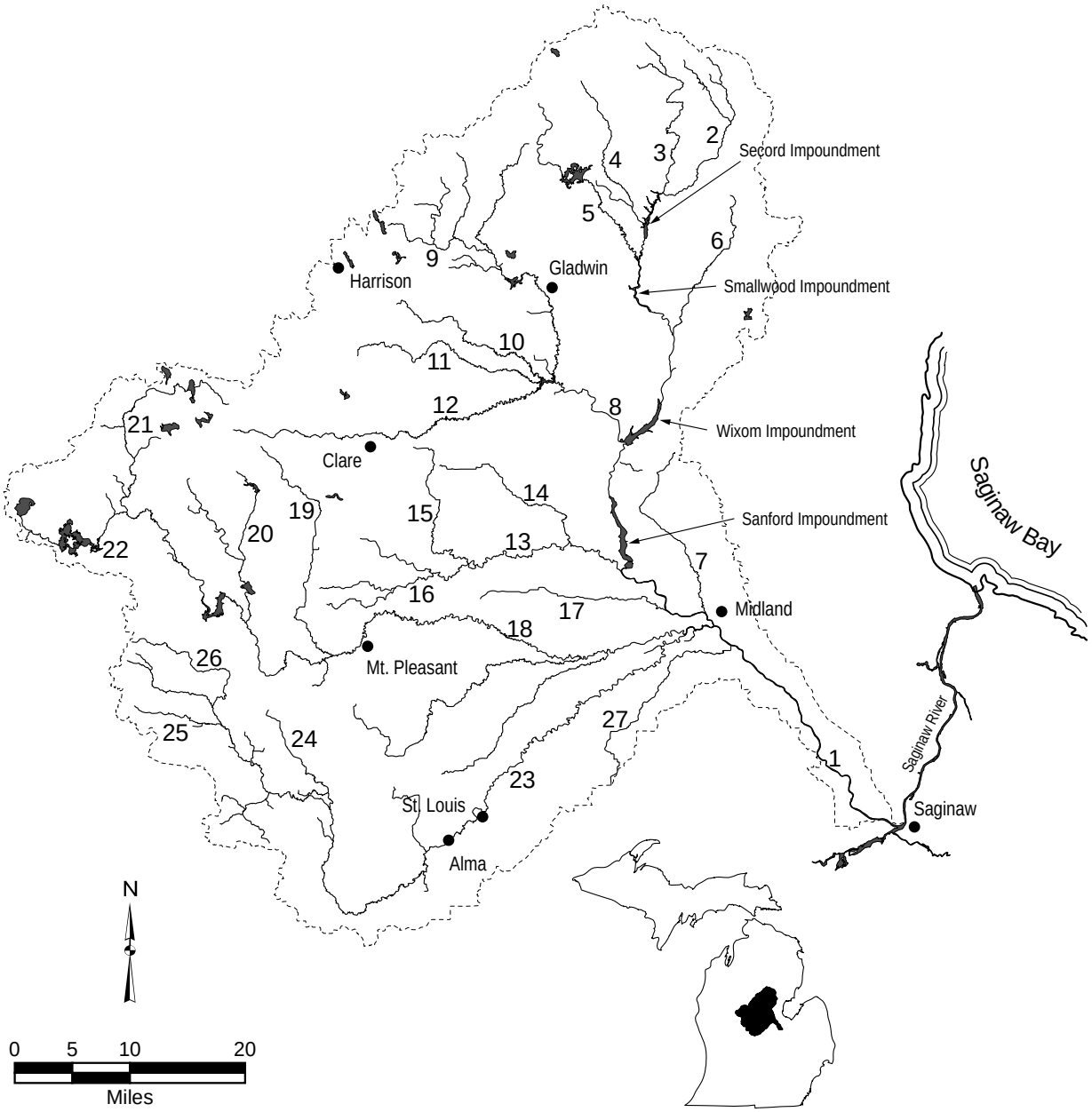

1 – Tittabawassee River
2 – East Branch Tittabawassee River
3 – Middle Branch Tittabawassee River
4 – West Branch Tittabawassee River
5 – Sugar River
6 – Molasses River
7 – Sturgeon Creek
8 – Tobacco River
9 – Cedar River
10 – North Branch Tobacco River
11 – Middle Branch Tobacco River
12 – South Branch Tobacco River
13 – Salt River
14 – Bluff Creek
15 – North Branch Salt River
16 – South Branch Salt River
17 – Carroll Creek Drain
18 – Chippewa River
19 – North Branch Chippewa East River
20 – Coldwater River
21 – North Branch Chippewa West River
22 – West Branch Chippewa River
23 – Pine River
24 – North Branch Pine River
25 – South Branch Pine River
26 – Pony Creek
27 – Bullock Creek

Figure 1.–Tittabawassee River system and its watershed boundary.

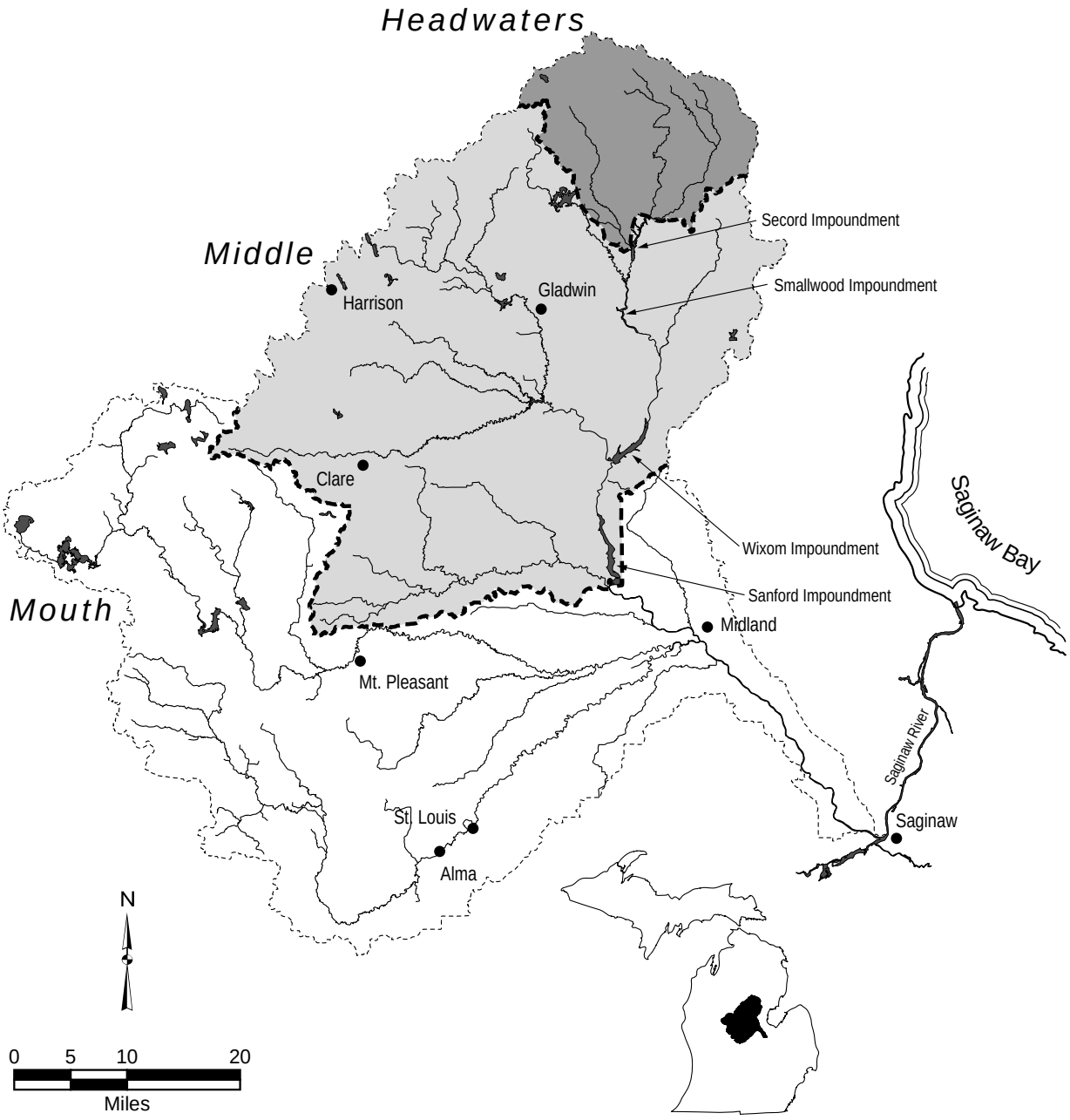

Figure 2.–Main stem valley segments of the Tittabawassee River.

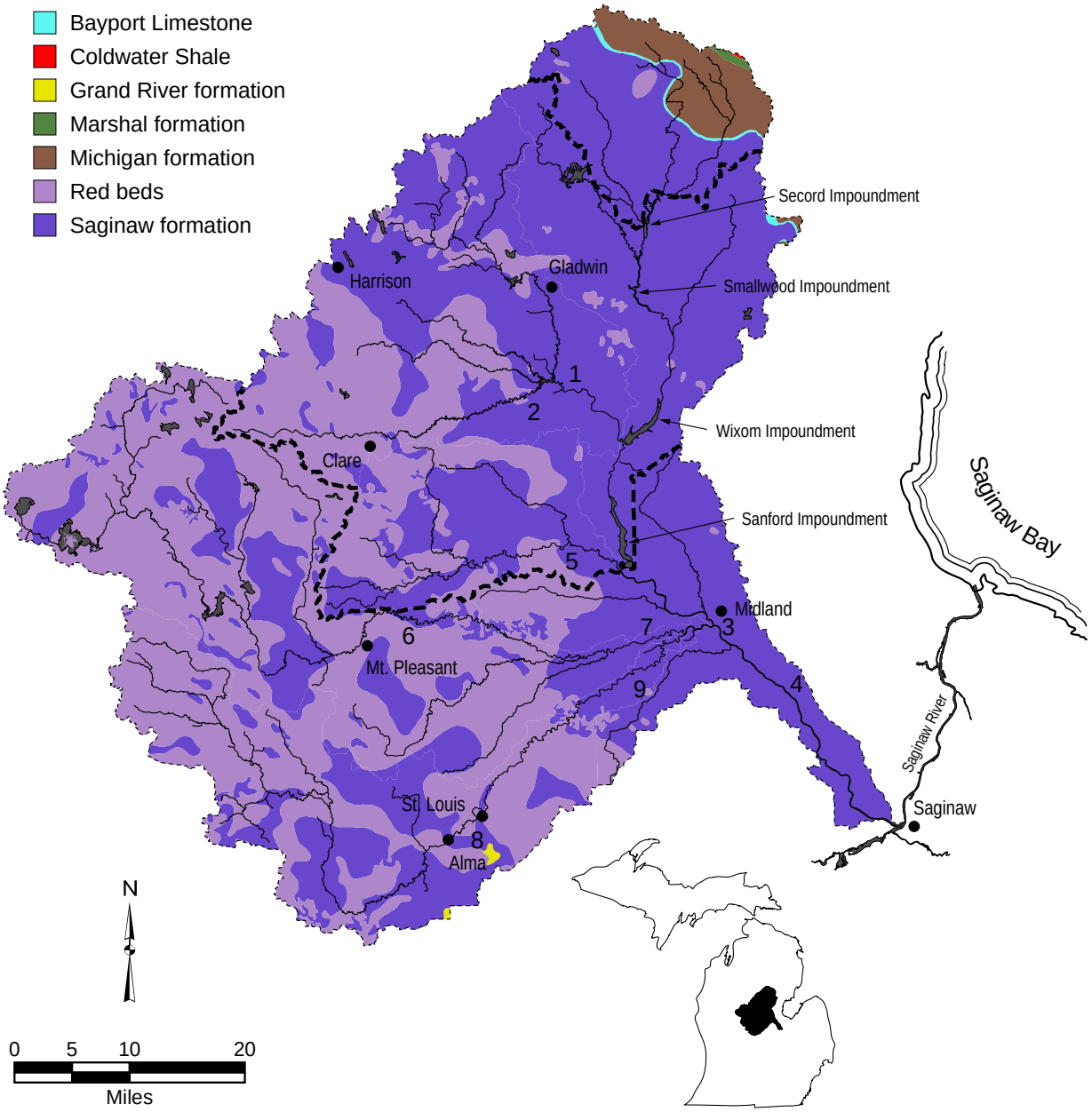

Figure 3.–Bedrock geology of the Tittabawassee River watershed.

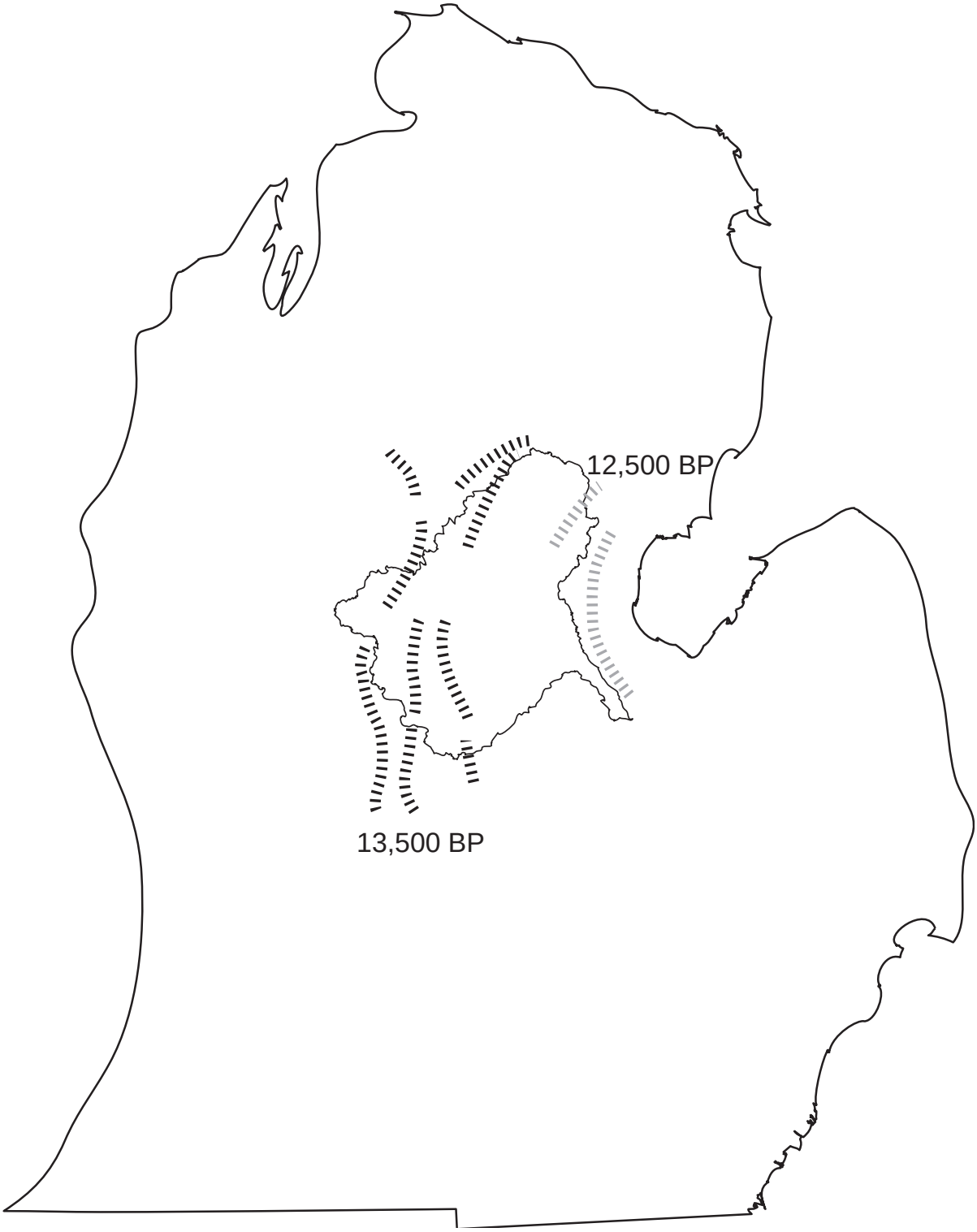

Figure 4.–Glacial advance borders (hash marks) forming the Tittabawassee River watershed (modified from Farrand 1988). Advance borders (dark hash) along the western edge of the watershed occurred approximately 13,500 years before present (BP) and the borders (light hash) along the eastern edge of the watershed occurred approximately 12,500 years BP.

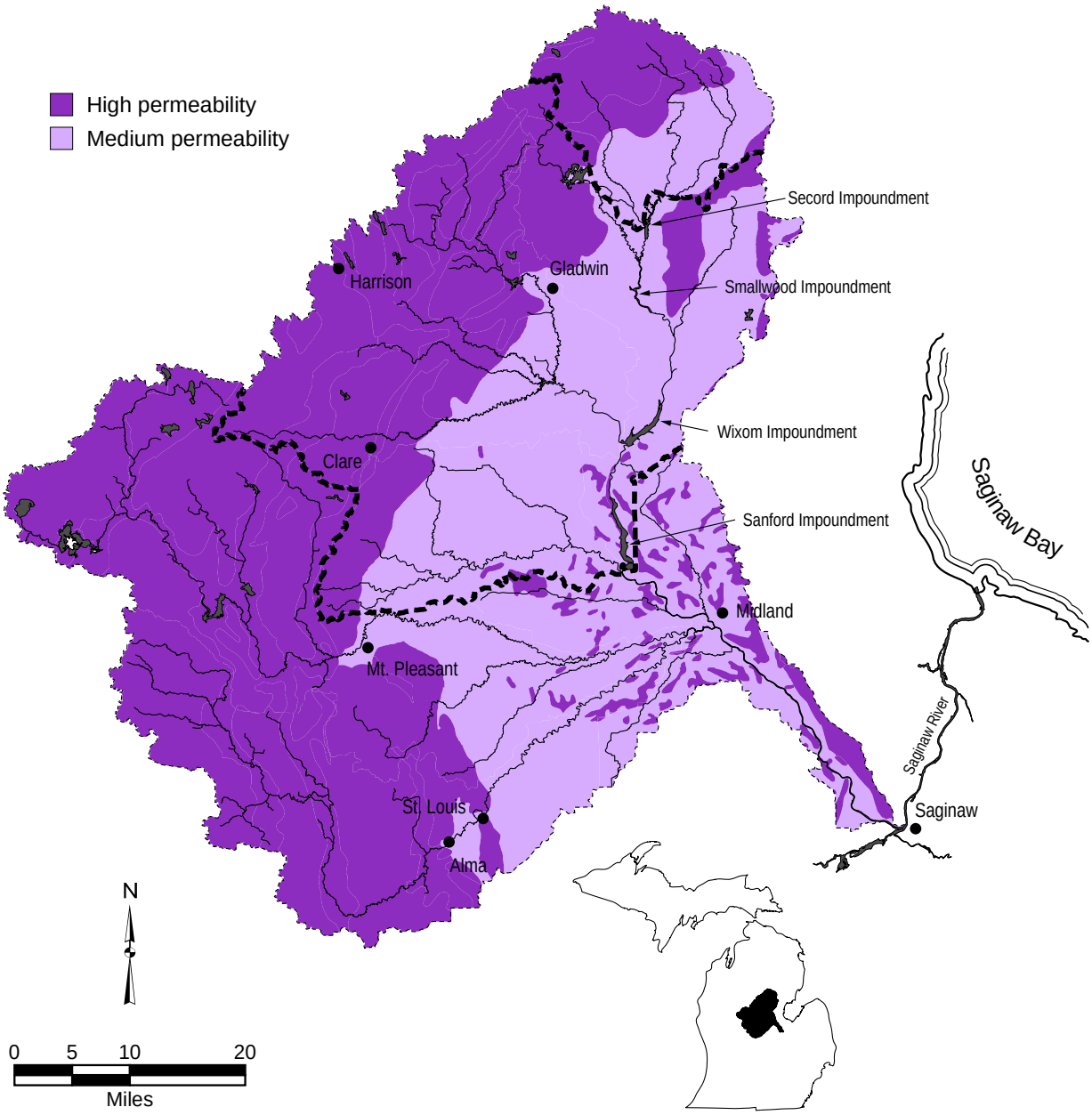

Figure 5.–Permeability of surficial deposits in the Tittabawassee River watershed.

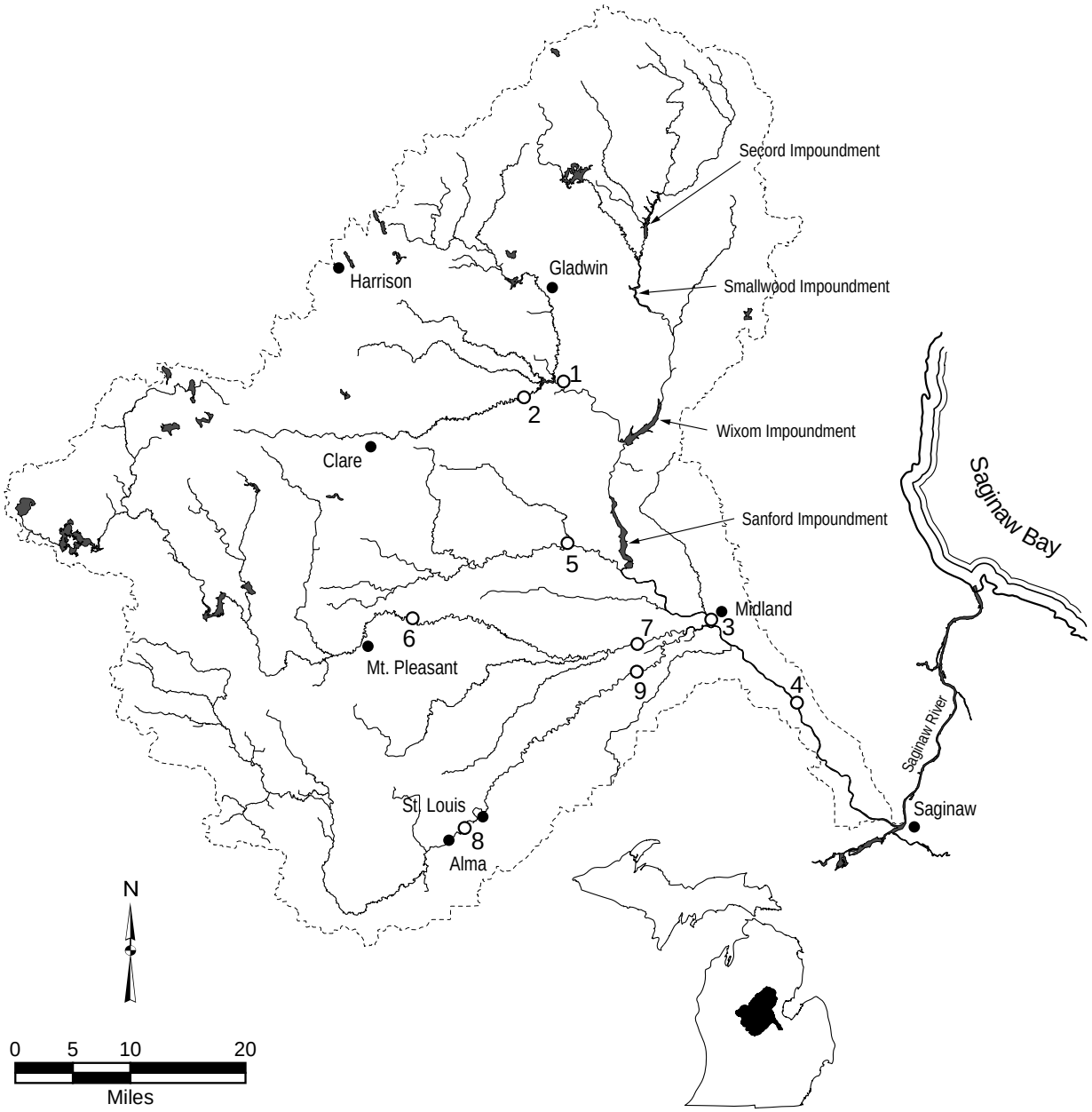

Figure 6.–United States Geological Survey gauge sites in the Tittabawassee River watershed. See Table 7 for gauge site descriptions.

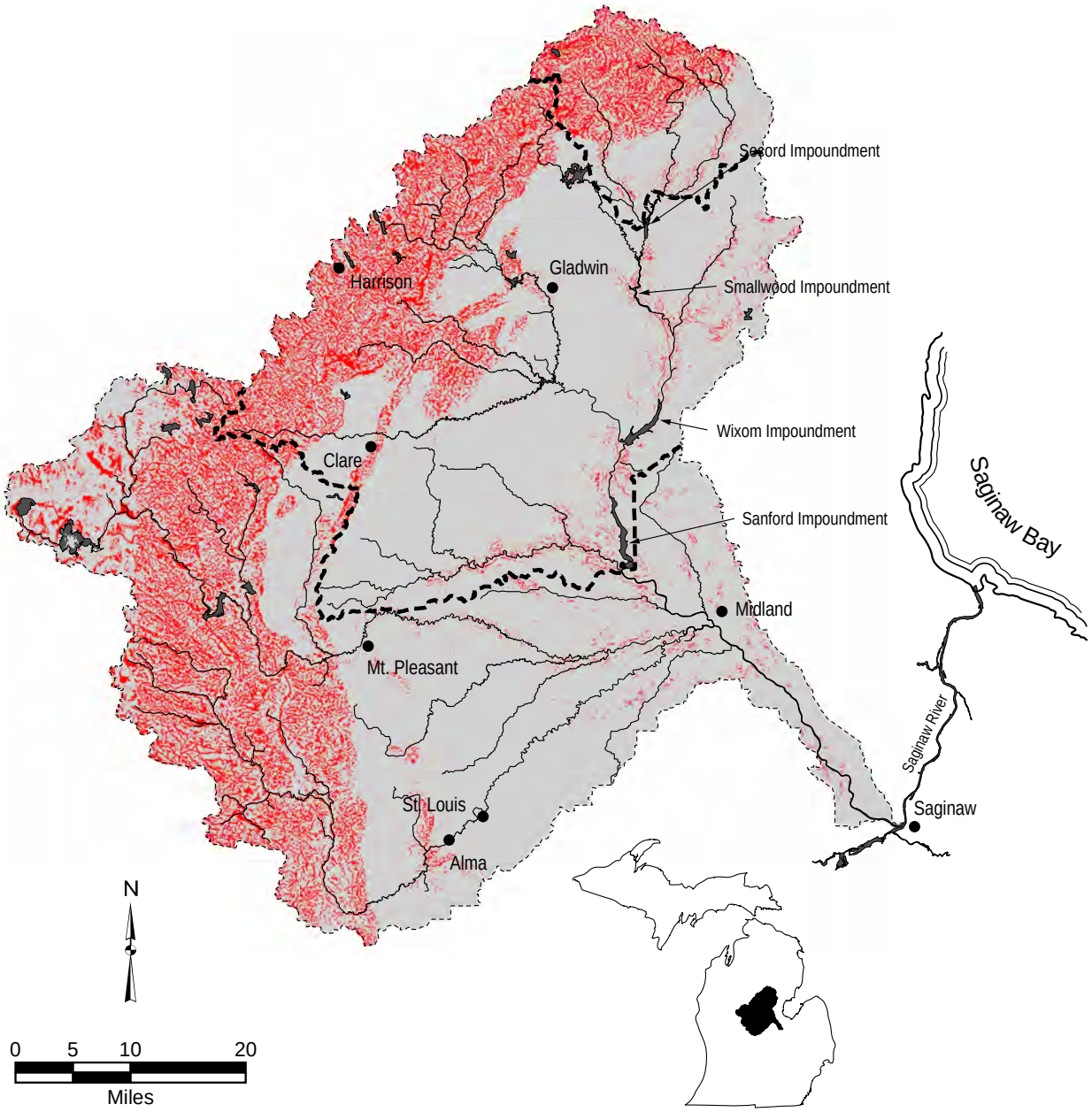

Figure 7.–Areas of groundwater recharge and discharge in the Tittabawassee River watershed. Areas where groundwater recharge is high are shown in grey and areas where groundwater discharge is high are shown in red.

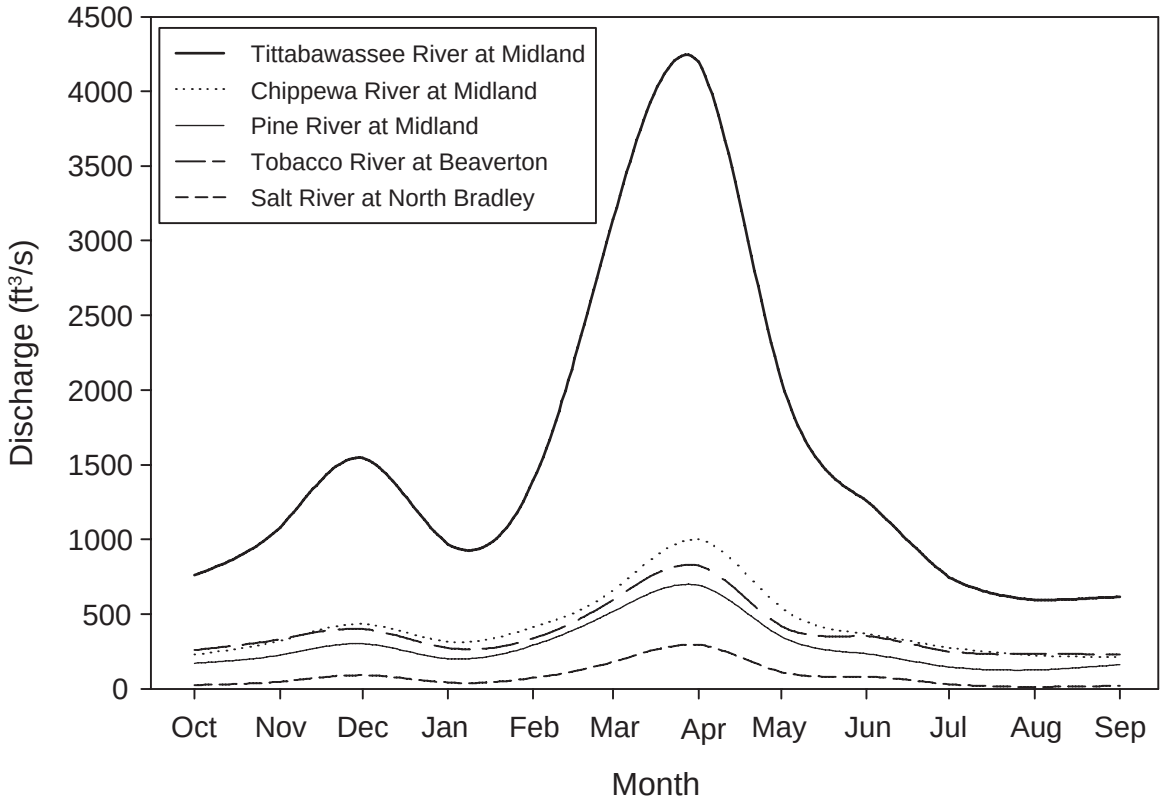

Figure 8.–Mean monthly discharge for selected locations in the Tittabawassee River watershed for years 1963–71. Data from United States Geological Survey.

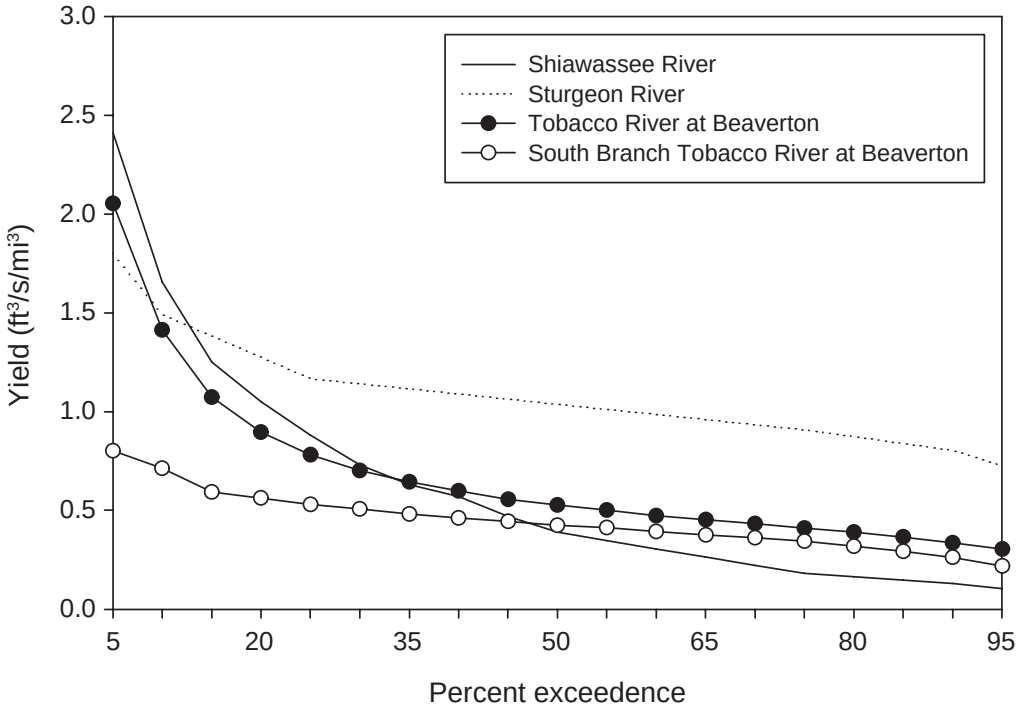

Figure 9.–Yield ($ft^3/s/mi^2$) exceedence curves for the Tobacco River (Tobacco River at Beaverton and South Branch of the Tobacco River at Beaverton). Comparison exceedence curves are given for the Shiawassee and Sturgeon rivers. Exceedence curve represents the frequency of a discharge exceeding a given rate. Data from the Unived States Geological Service for period of record.

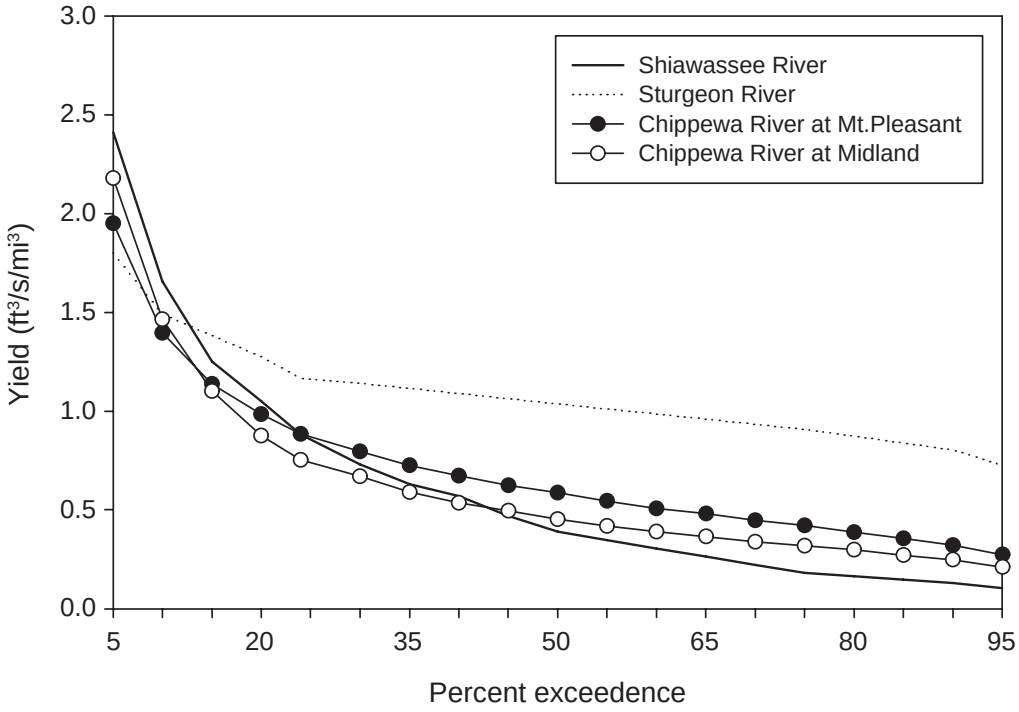

Figure 10.–Yield ($ft^3/s/mi^2$) exceedence curves for the Chippewa River (Chippewa River at Mt. Pleasant and Chippewa River at Midland). Comparison exceedence curves are given for the Shiawassee and Sturgeon rivers. Exceedence curve represents the frequency of a discharge exceeding a given rate. Data from the Unived States Geological Service for period of record.

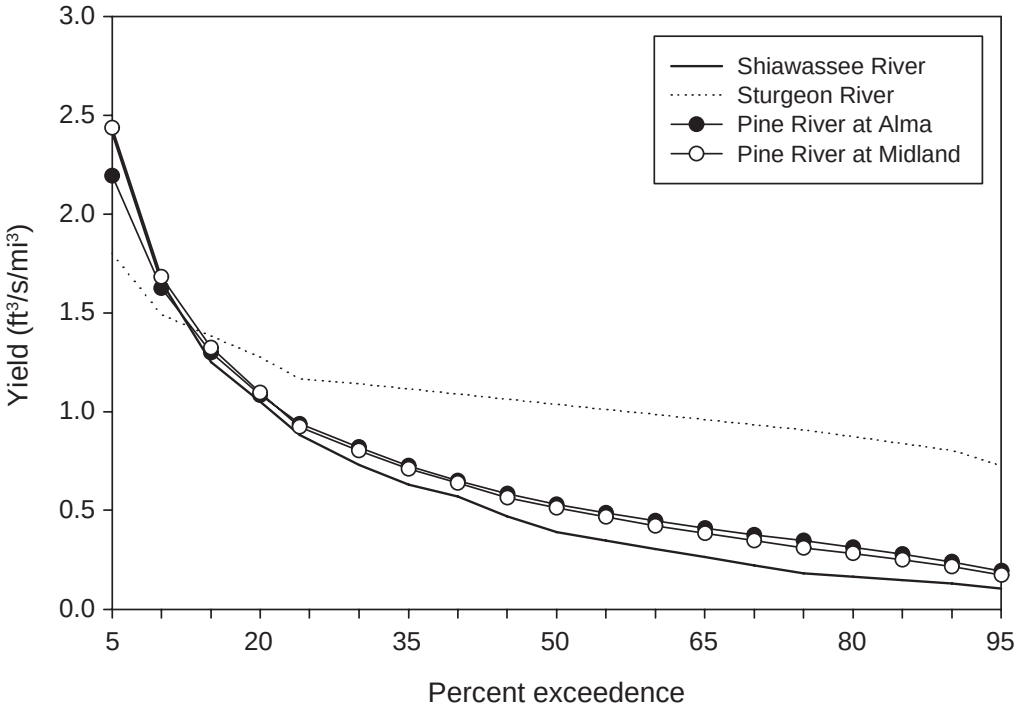

Figure 11.–Yield ($ft^3/s/mi^2$) exceedence curves for the Pine River (Pine at Alma and Pine at Midland). Comparison exceedence curves are given for the Shiawassee and Sturgeon rivers. Exceedence curve represents the frequency of a discharge exceeding a given rate. Data from the Unived States Geological Service for period of record.

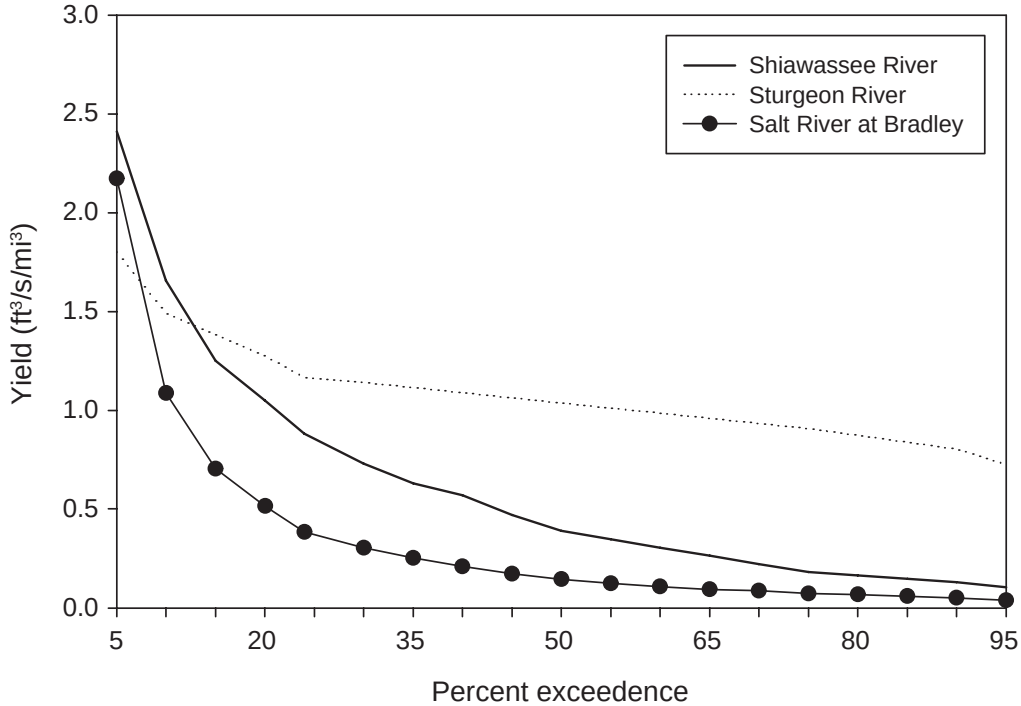

Figure 12.–Yield ($ft^3/s/mi^2$) exceedence curves for the Salt River (Salt near North Bradley). Comparison exceedence curves are given for the Shiawassee and Sturgeon rivers. Exceedence curve represents the frequency of a discharge exceeding a given rate. Data from the Unived States Geological Service for period of record.

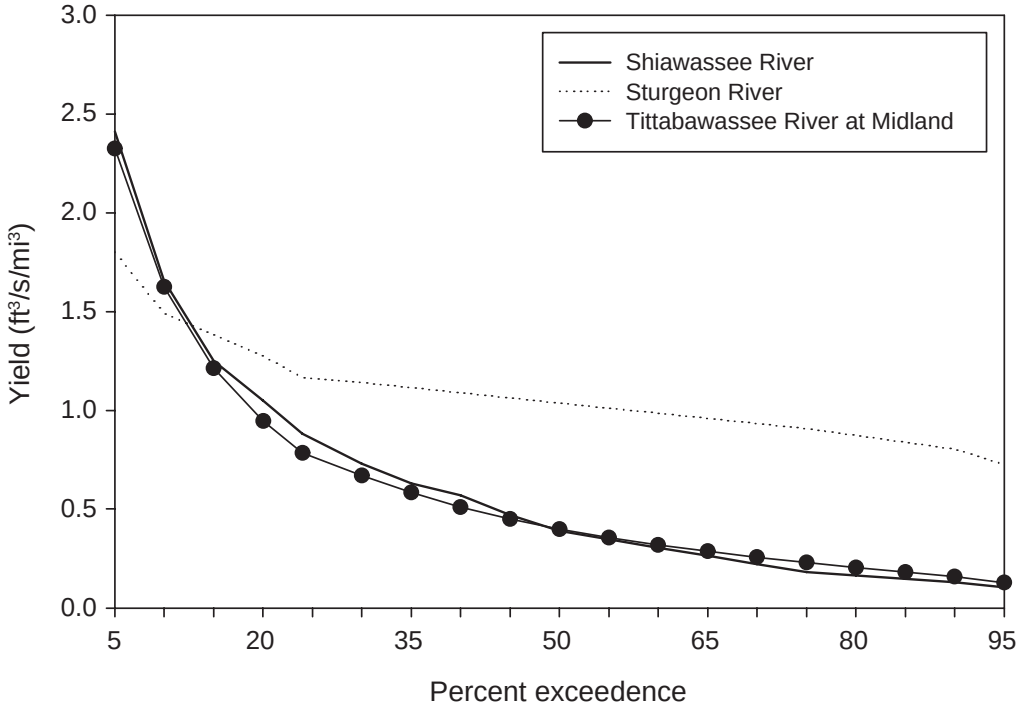

Figure 13.–Yield ($ft^3/s/mi^2$) exceedence curves for the mouth segment (Tittabawassee River at Midland). Comparison exceedence curves are given for the Shiawassee and Sturgeon rivers. Exceedence curve represents the frequency of a discharge exceeding a given rate. Data from the Unived States Geological Service for period of record.

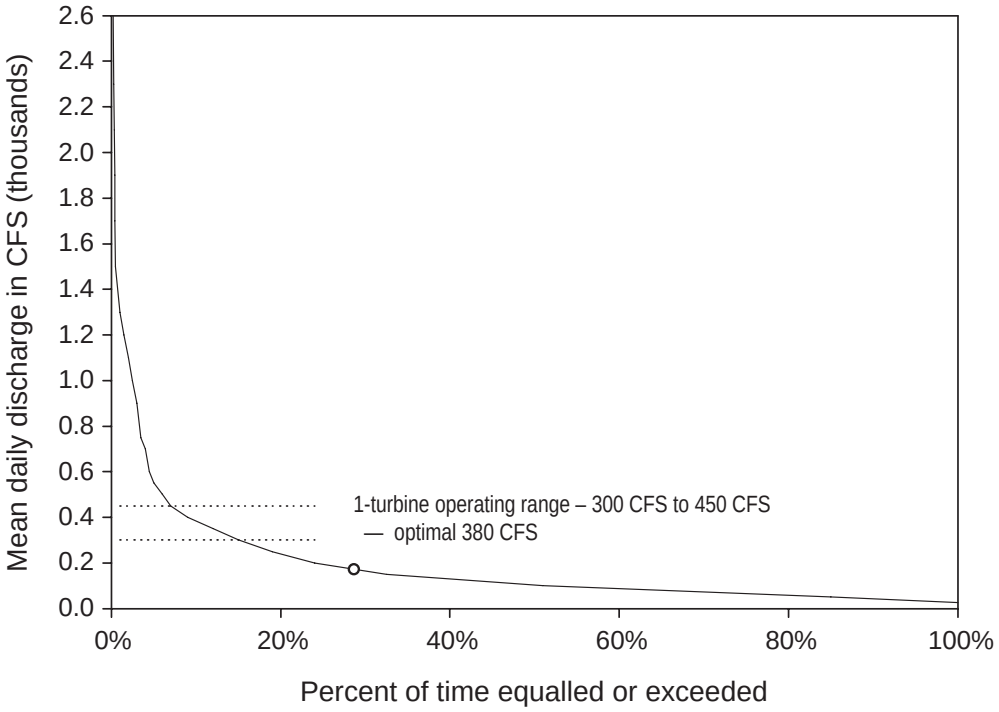

Figure 14.–Percentage of operational times by mean monthly discharge for Secord Dam turbine. Mean annual discharge is indicated by a circle. Data are from FERC (1998a). Period of record is for water years 1977–91.

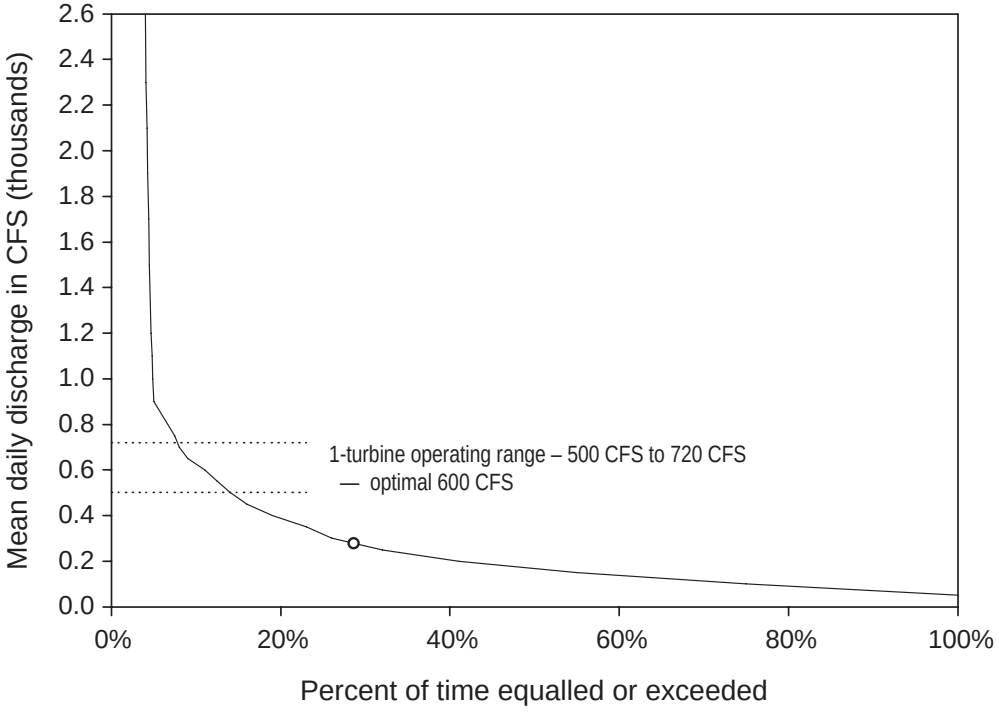

Figure 15.–Percentage of operational times by mean daily discharge for Smallwood Dam turbine. Mean discharge is indicated by a circle. Data are from FERC (1998a). Period of record is for water years 1977–91.

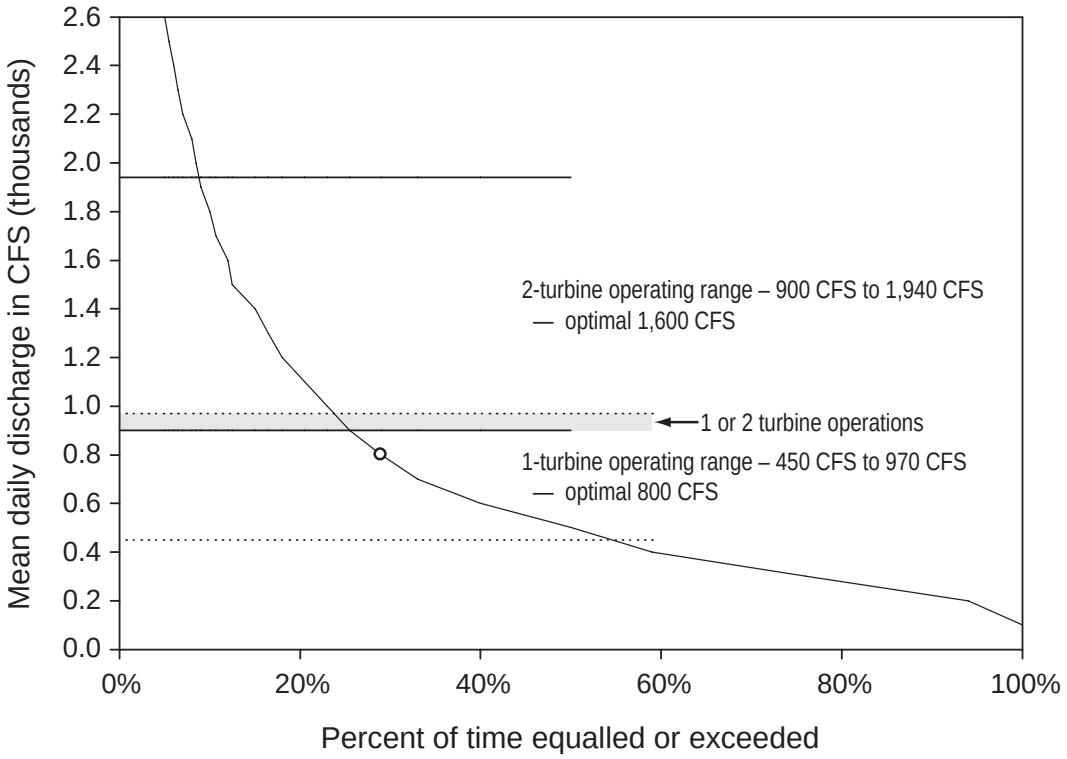

Figure 16.–Percentage of operational times by mean daily discharge for Edenville Dam (Wixom Lake impoundment) turbines. Mean discharge is indicated by a circle. Data are from FERC (1998a). Period of record is for water years 1977–91.

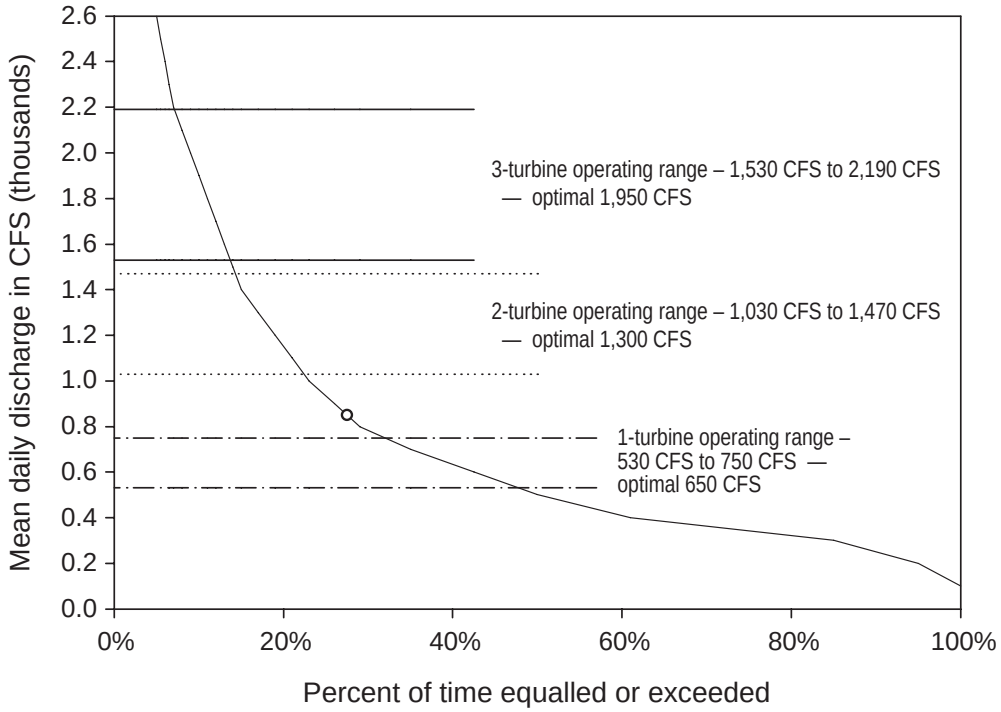

Figure 17.–Percentage of operational times by mean daily discharge for Sanford Dam turbines. Mean discharge is indicated by a circle. Data are from FERC (1998a). Period of record is for water years 1977–91.

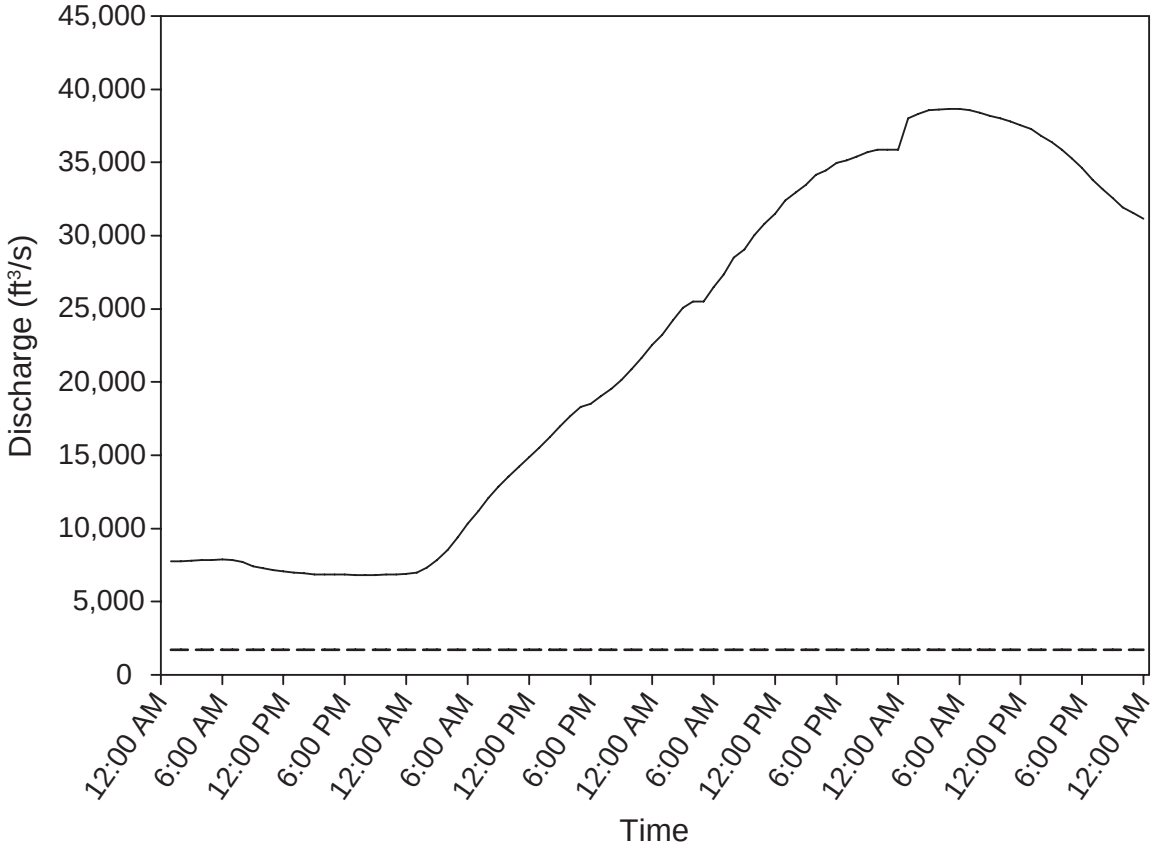

Figure 18.–Instantaneous discharge of the Tittabawassee River at Midland from September 10 to 13, 1986 and mean flow for the period of record 1936–2003. Data from United States Geological Survey.

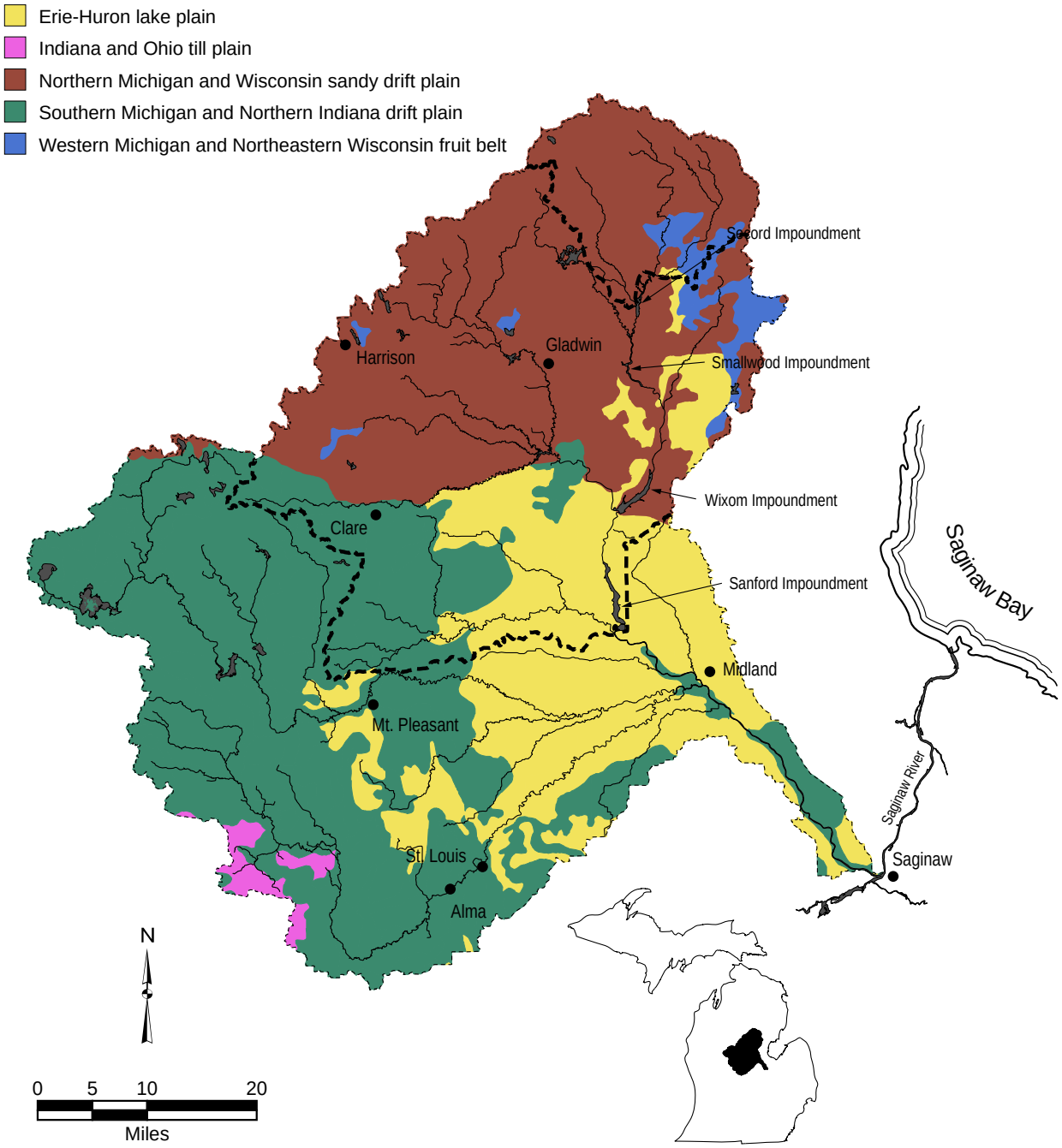

Figure 19.–Major land resource areas of the Tittabawassee River watershed.

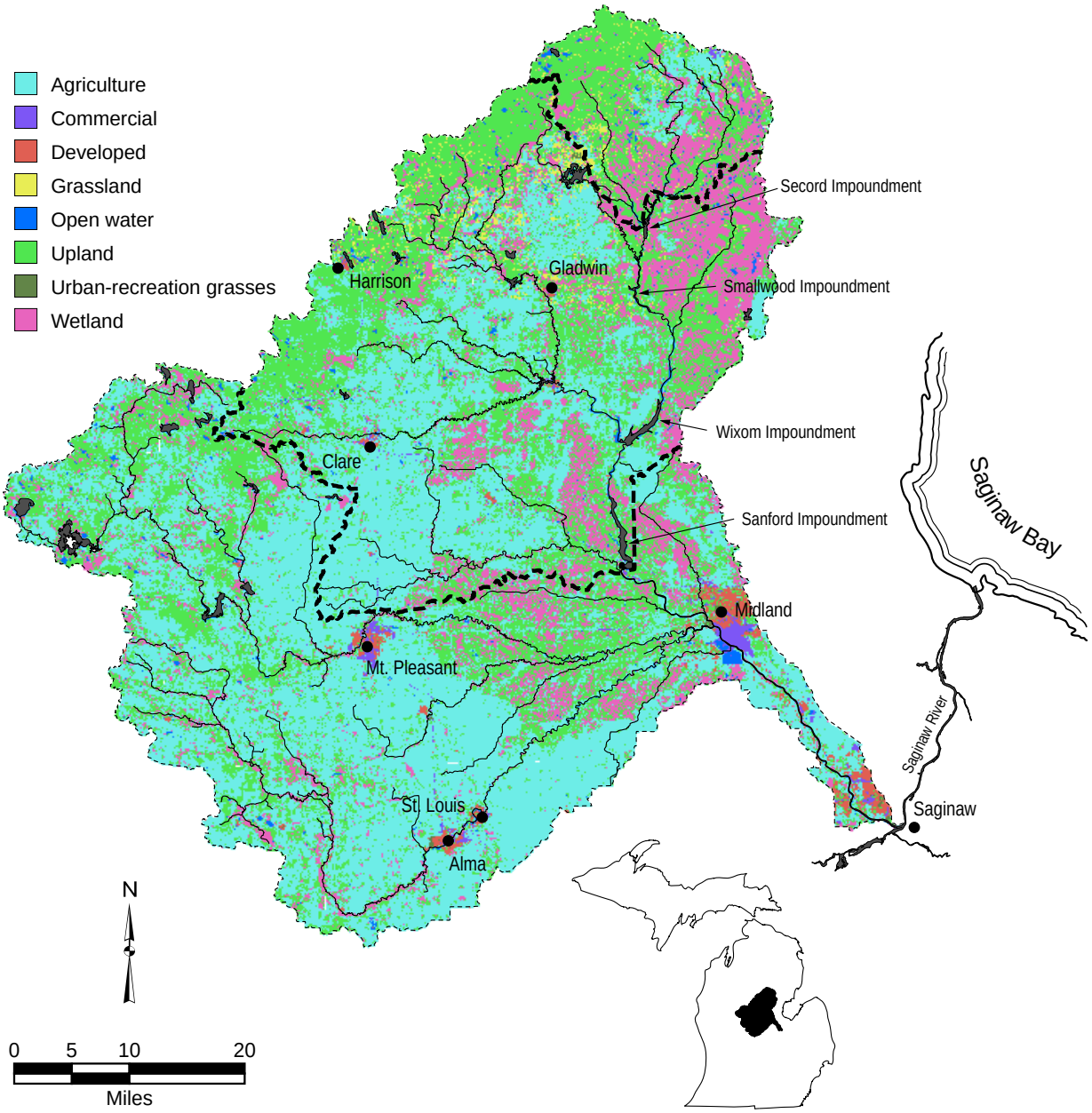

Figure 20.–Land use types within the Tittabawassee River watershed.