Michigan's Water Wonderland
The Dead River

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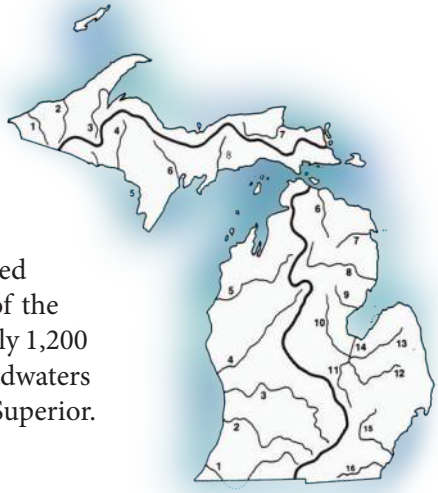
This article explores one of Michigan's extraordinary water resources, the Dead River in the Upper Peninsula. Unlike the Lower Peninsula where waters drain east or west, waters in the Upper Peninsula tend to drain north and south. Much of the southern portion of the Upper Peninsula drains to Lakes Michigan and Huron while much of the northern portion of the peninsula drains to Lake Superior.

The Dead River is the largest river in Marquette County flowing to Lake Superior. From its headwaters in the high-grounds in the western part of the county, the river flows forty plus miles before discharging to Presque Isle Harbor and Lake Superior at the city of Marquette. The exact origin of the name "Dead River" is unclear. On early French maps, the river is named "Rivière des Morts" or in English, "River of the Dead." On Michigan's original land survey maps from the mid-1800s, the river is called both the Nekomenon River and the Dead River. Although speculative, the unflattering name "Dead River" may be related to the presence of tannins in the river which impart an almost black or "dead" appearance to the water. The original land survey maps depict the Dead River as free-flowing with numerous feeder streams along its course. Recent archeological digs in the area have unearthed pre-historic artifacts dating back to the last ice age.

Hydroelectric facilities of some sort have existed on the Dead River for over a century. Today, the Dead River is impounded by five dams. The Silver Lake Dam is the furthest upstream and, moving downstream, other dams include the Hoist, McClure, Forestville, and Tourist Park Dams. The biggest of the dams, the Hoist, creates the largest impoundment on the river, the 2,700-acre Dead River Storage Basin. Submersed and protruding tree stumps throughout the basins and strewn along shore are testament to the low-lying forested areas that existed prior to the construction of the dams. There is approximately 1,200 feet of fall between the headwaters of the Dead River and Lake Superior.



Michigan Major Drainage Divides and Rivers.

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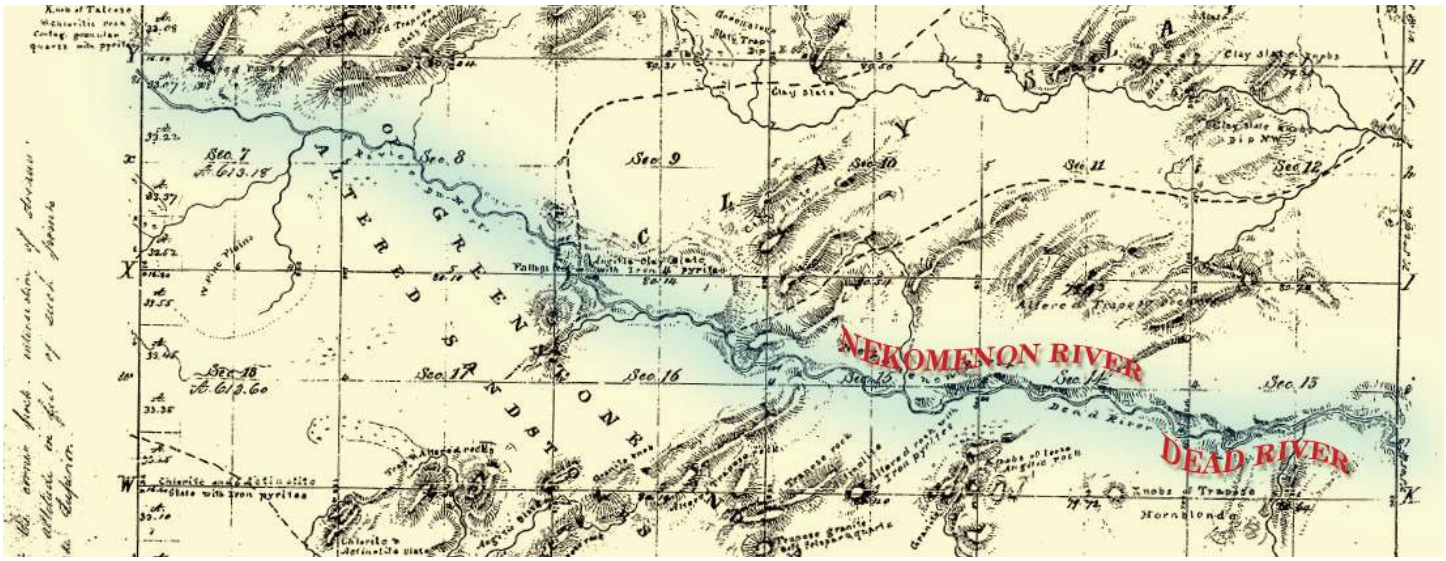
Hoist Dam — Dead River Storage Basin



Dead River - Original Land Survey (1845)

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The Dead River is fed by several cold-water trout streams which, absent deadfall or an occasional beaver dam, flow largely unimpeded though boreal forests and expansive ravines. The beauty and tranquility of the region inspired local fly-fisherman, attorney, judge and author John Volker to write several books (under the pen name Robert Traver) including Trout Madness and Anatomy of a Fisherman. Unlike its cold-water tributary streams, the impounded lower stretches of the Dead River are more conducive to cool-water fishes such as pike, walleye, and smallmouth bass.

A discussion about the Dead River would be not be complete without mentioning the weather. The climate in the region is strongly influenced by Lake Superior. Winters are long and cold. Due to the fact that Lake Superior rarely freezes over, lake effect snow persists throughout much of the winter. Average annual snowfall in the region is approximately 150 inches. The proximity of Lake Superior results in cold springs, cool summers and relatively warm falls, as heat is released from Lake Superior.

The Dead River has a watershed or drainage area of approximately 100,300 acres or 157 square miles. Swedish, Norwegian, and Finnish immigration to the area in the nineteenth century helped fuel burgeoning mining and lumber industries and played an important role in the historical development of the watershed. Remnant mines and lumber camps are common throughout the area. Mining and lumbering activities in the watershed have largely given way to hunting, fishing, blueberry-picking and other recreational pursuits.

Dead River Sauna

The Dead River watershed is heavily forested. Much of the land around Silver Lake is undeveloped and accessible only by antiquated logging roads. Some of the most remote portions of the watershed lack electrical service. Numerous homes and seasonal camps have been built along the shores of the Dead River Storage and McClure Basins. Saunas along the basin shorelines bear witness to the many Scandinavians that settled the area. The lower watershed in and around the

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Abandoned Mine Shaft, Ishpeming, Michigan

DEAD RIVER FACTS AND FIGURES

- Location — Marquette County, Michigan
- Total length — 45 miles
- Watershed area — 100,300 acres or 157 square miles
- Number of named tributaries — 18
- Headwater elevation — 1,814 feet above sea level
- Total fall (headwater to Lake Superior) — 1,212 feet

Area of Impoundments

- Silver Lake — 1,425 acres
- Dead River Storage Basin — 2,738 acres
- McClure Basin — 104 acres
- Forestville Reservoir — 83 acres
- Tourist Park Reservoir — 110 acres

Height of Dams

- Silver Lake – 30 feet
- Hoist (Dead River Storage Basin) Dam - 63 feet
- McClure Basin Dam - 51 feet
- Forestville Reservoir Dam - 62 feet
- Tourist Park Reservoir Dam – 33 feet

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City of Marquette is largely urbanized. However, much of the watershed remains sparsely populated, notwithstanding the numerous deer and fishing camps scattered throughout the region.

One of the most striking features of the Dead River watershed is its topography. Near-vertical rock outcroppings exist in the northern portion of the watershed and, in terms of elevation, some of the high grounds in the Dead River watershed are more than 1,800 feet above sea level.

Hydroelectric facilities on the Dead River are licensed by the Federal Energy Regulatory Commission (FERC). The three upper reservoirs (Silver Lake, Dead River Storage Basin and the McClure Basin) are within FERC's Dead River Project, and the two lower reservoirs (Forestville and Tourist Park) are within FERC's Marquette project. The FERC licenses contain requirements for minimum flow releases, temperature maximums, minimum dissolved oxygen levels, monitoring and a variety of other provisions. The Silver Lake dam is used to store spring runoff to augment downstream flows later in the year. The water level in Silver Lake is typically drawn down each fall to accommodate the spring snow melt. One consequence of power generation on the Dead River is that periodic water level fluctuations have caused extensive shoreline erosion.

In May of 2003, disaster struck the Dead River. Frozen ground and unusually heavy rainfall conspired to dramatically raise the water level in the Silver Lake Basin. On May 14, a portion of the Silver Lake dam gave way and an estimated 9 billion gallons of water were released downstream. An incident report at the time prepared by FERC described what happened:

Late in the afternoon on Wednesday, May 14, 2003, high and turbid flows were observed in the Dead River several miles downstream of the remote Silver Lake Basin in Marquette County, Michigan. An operator was dispatched to the site and found that a fuse plug embankment, a feature of the project that is designed to fail sacrificially to prevent failure of more critical project works, had activated. The fuse plug embankment was entirely eroded away and erosion had progressed well into the discharge channel bottom and side slopes. The dam owner activated the emergency action plan and steps to protect downstream lives and property were initiated. During the subsequent 24-hour period, over 1700 residents were evacuated, several local road bridges and an abandoned railroad bridge were damaged or washed out, the City of Marquette's Tourist Park dam near the mouth of the Dead River was overtopped and failed, the Presque Isle coal-fired power plant was shut down due to flooding, and two

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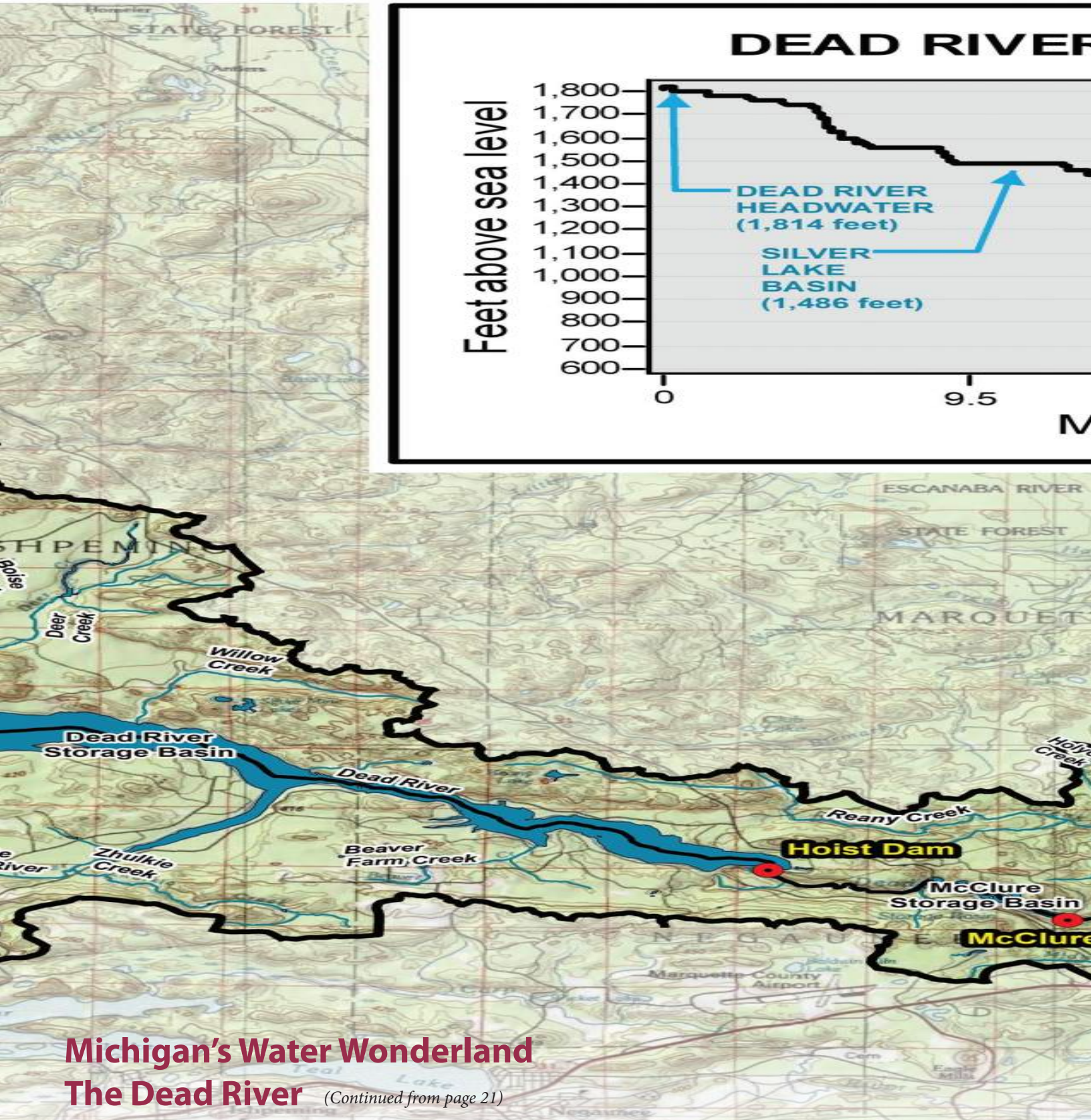

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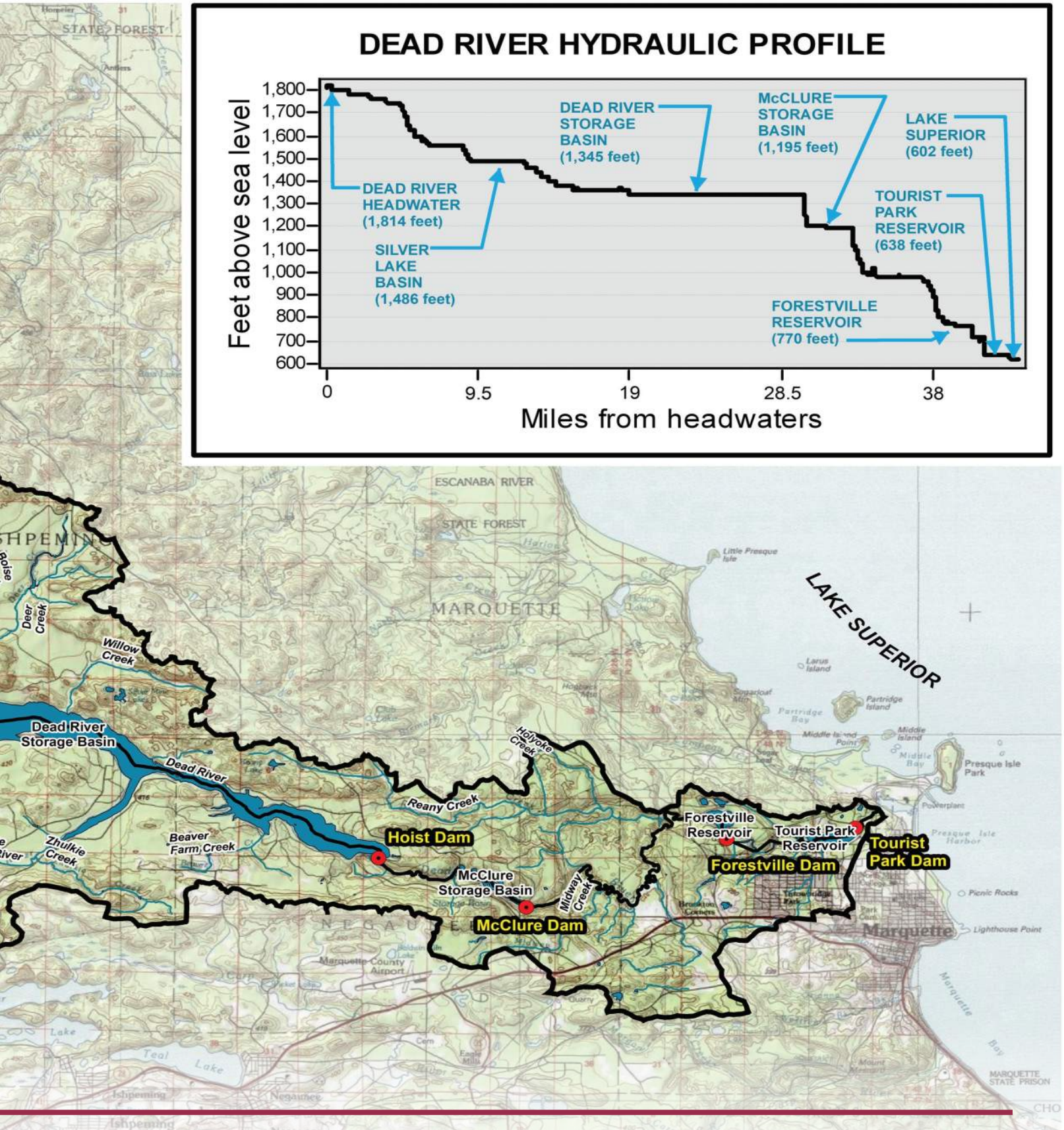
mines that rely on electric power from the power plant were shut down. There was extensive erosion of the river banks and significant impacts to the Dead River fishery. No loss of life or personal injuries occurred.

As the flood waters surged, television coverage of the event showed boats that had been uplifted from their moorings being carried by floodwaters over the Hoist dam. Sediment and debris were strewn throughout Presque Isle Harbor in Lake Superior. The incident caused an estimated $100 million in damages. Rapid implementation of an Emergency Action Plan was credited with preventing loss of life. Ironically, the fuse plug portion of the dam that failed was constructed in 2002 to increase the hydraulic capacity of the dam to be able to safely pass extreme flood flows. The dam at Silver Lake has since been repaired and a multi-faceted restoration project undertaken to remediate infrastructure damage



and to restore the river corridor and associated wetland and floodplain areas damaged by the flood. Natural river channel design techniques were employed in an attempt to restore the natural functionality and stability of the river stretches impacted by the flood.

With its varied fish, land and water resources, the Dead River is a truly unique ecosystem. The story of the Dead River is one of countless stories that can be told about Michigan's rich water heritage. Water has played an integral role in many of Michigan's historical transformations, and the same will undoubtedly hold true as we move to the future. Michigan is truly a water wonderland!