R2. Describe the methods used for habitat, fish collection, and macroinvertebrate collection;

Aquatic surveys have been conducted on behalf of Nestlé Waters North America since 2003 at the White Pine Springs site located near Evart, Michigan. Aquatic surveys were conducted in 2003, 2008, 2009, 2010, 2011, 2012, 2013, 2015, and 2016. The purpose of the 2003 aquatic survey was to establish baseline conditions for the fish and aquatic macroinvertebrate communities and describe general habitat conditions. Follow-up aquatic surveys were conducted to evaluate fish and macroinvertebrate communities and habitat conditions in each sample station over time. Aquatic surveys have been consistently conducted in a total of four sample stations in Twin Creek since 2003 (Figure 1). Stations SG5 and SF8 of Chippewa Creek were surveyed in 2003 and again in 2015 and 2016. Station SF16 of Chippewa Creek has been consistently surveyed since 2003. Except for Stations SF8 and SG5, all sample stations are 100 feet in length. The length of Station SF8 is approximately 400 feet and the length of Station SG5 is approximately 200 feet. General habitat conditions were noted and photographs were taken at all stations. The Michigan County Element List was reviewed to determine if any threatened, endangered, or special concern aquatic species occurred within Twin Creek or Chippewa Creek at the time of each aquatic survey (MNFI, 2003 through 2016).

Fish Collection

A multi-pass removal technique was used to evaluate fish distribution and abundance in each sample station in 2003 (Van Deventer and Platts 1983). Sample stations were blocked at the upstream and downstream extents using seines that measured 4 feet by 50 feet, with a 0.18-inch mesh size. A backpack electroshocker was used to sample each station and was conducted for three consecutive passes in an upstream direction. The duration of electroshocking was recorded for each pass and stunned fish were placed in a live well for identification and enumeration. Following each pass and subsequent fish identification, the enumerated fish were released approximately 100 feet downstream of the station so that they would not be re-collected in subsequent passes.

Fish were collected by wading each sample station using a backpack electroshocker from 2008 through 2016. A single upstream pass has been conducted to evaluate fish community composition and relative abundance throughout each sample station. Sample stations were not blocked with nets as part of the single pass removal. The duration of electroshocking has been recorded and stunned fish were placed in a live-well for identification and enumeration. As part of the enumeration process, the species, length,

weight, and number of fish captured were recorded. Fish were returned alive to the system following collection and identification. Fish were identified to species using various taxonomic references (Bailey et al., 2003; Coon, 2001; Becker, 1983).

Macroinvertebrate Collection

Aquatic macroinvertebrates, including mussels and decapods (crayfish), are collected within each station using D-framed kick nets upon completion of fish sampling (Merritt et al., 1996). Stations were sampled for 30 minutes using two kick nets (total sample time = 1 hour/station) and samples were collected in all habitat types within each station to characterize the macroinvertebrate community. Collected specimens were stored in 250 milliliter (ml) plastic wide-mouth jars containing 70% ethanol, and were identified using various taxonomic references (Bright, 2015; Merritt et al., 2008; Cummings and Mayer, 1992; Peckarsky et al., 1990; Pennak, 1990).

Habitat and Water Quality Evaluations

General stream characteristics including woody and herbaceous vegetation, abundance of woody debris, stream habitat type, and substrate are recorded in each station. Wetted stream width was measured at the lower, middle, and upper extent of each sample station and was collected for years. Depth was measured in the center, and at 20% and 80% of each stream width cross section. Stream flow was measured in Stations SF1, SF5, SF9, SG5 SF8, and SF16 with a Marsh McBirney Flo-Mate 2000®(Buchanan and Somers, 1969). Water temperature, dissolved oxygen, pH, and conductivity were measured at the lower, middle, and upper extent of each sample station using a Yellow Springs Instrument Model YSI Professional Plus water quality meter. Station width, depth, stream flow, and water quality parameters were collected in each station from years 2008 through 2016. Photographs were taken at downstream and upstream extents of each station to illustrate the conditions during the sampling period.

Additional water temperature data have been continually collected at one-hour intervals from three HOBO® Water Temp Pro V2 - Model U22-001 HOBO data loggers since December 2012. One data logger has been located in middle reach of Station SF1, another data logger has been located approximately 30 feet downstream from the confluence of Stations SF5 and SF5-6, and the third data logger has been located in the downstream extent of Station SF9.

Two additional water HOBO data loggers were installed in SF8 and SG5 in the tributaries of Chippewa Creek in June 2015. Both of these data loggers were installed at the downstream extent of each sample station and continually record water temperature at one-hour intervals.

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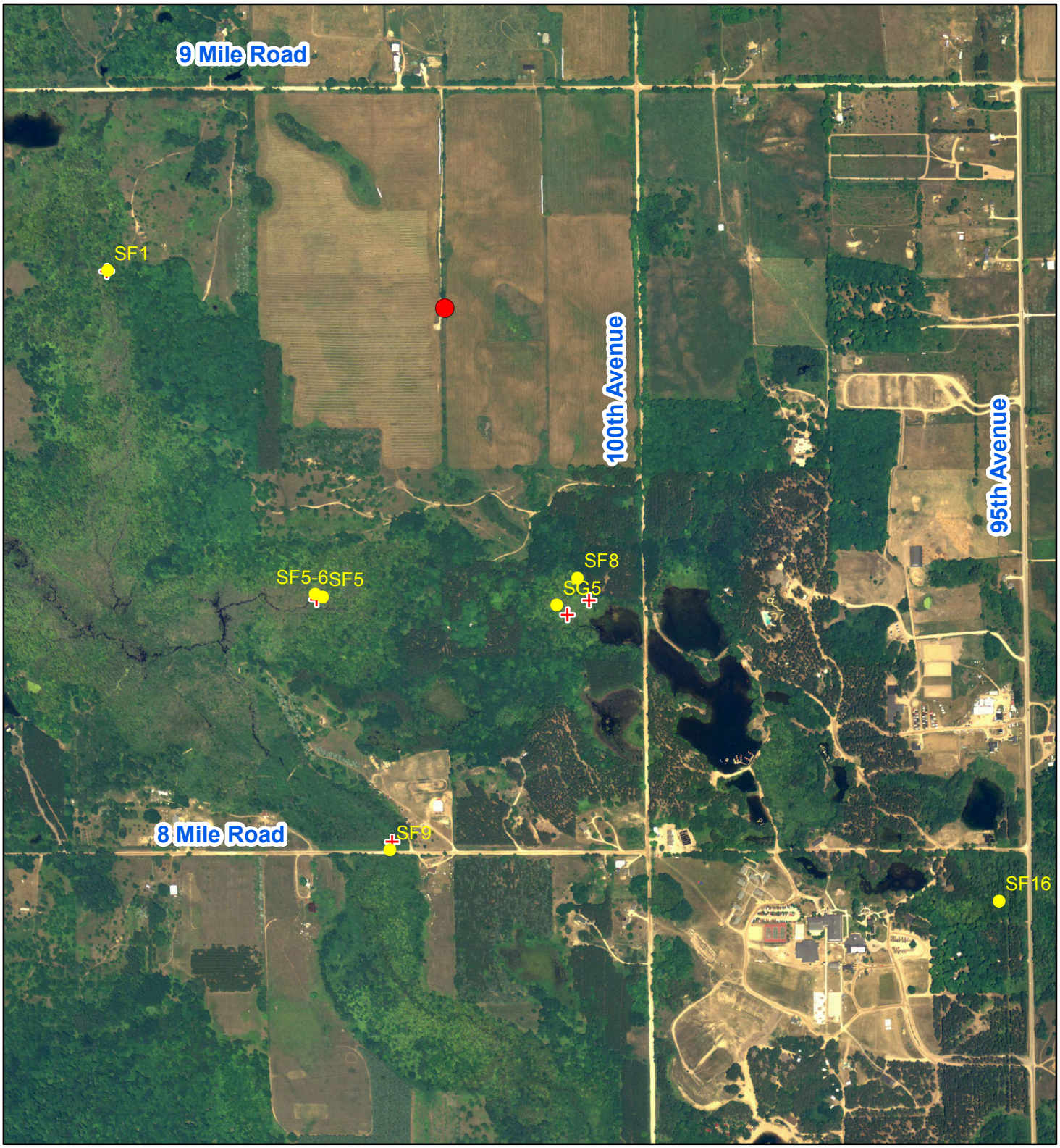

Base map and aerial imagery obtained from Michigan Geographic Data Library

Legend

- Sample Station Locations
- Approximate Location of Well
- \+ Water Temperature Monitor Locations

N

Feet
0 250 500 1,000 1,500 2,000

AEM ADVANCED ECOLOGICAL MANAGEMENT

PROJECT	NWNA White Pine Springs
TITLE	Sample Station Locations
FIGURE	1-2