PHASE I ARCHAEOLOGICAL SURVEY
PROSPECTOR LOOP TRAIL
ST LOUIS COUNTY, MINNESOTA

COMMONWEALTH
HERITAGE GROUP

WR-1073

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PROSPECTOR LOOP TRAIL
ST LOUIS COUNTY, MINNESOTA

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Prepared for

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WR-1073

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ABSTRACT

Lake County is proposing to construct 240 miles (mi) (386 kilometers [km]) of all-terrain vehicle (ATV) trails for the Prospector Loop ATV Trail project in northeastern Minnesota. This project is funded by the Federal Highway Administration (FHWA) through its Federal Recreational Trail Program (FRTP). MnDOT is reviewing the project in compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (Public Law 89-665), and its implementing regulations (36 CFR 800). Section 106 requires agencies to account for the effects a project may have on cultural resources listed in or eligible for listing in the National Register of Historic Places (NRHP). MnDOT contracted Commonwealth Heritage Group (Commonwealth) to conduct a Phase I archaeological survey within the area of potential effects (APE) for a portion of the proposed project in St. Louis County, Minnesota, and for a bridge replacement in Lake County, Minnesota. This report presents the results of the Phase I archaeological investigations.

A Phase I archaeological survey of 28.93 mi (46.56 km) of proposed trail alignments in St. Louis County and nine bridge replacement locations in St. Louis and Lake counties was conducted by a Commonwealth archaeological field crew between July 11 and 21, 2016. These investigations did not result in the identification of any archaeological sites. No previously identified archaeological sites have been recorded within or adjacent to the project APE. It is Commonwealth's opinion that the proposed Prospector Loop ATV Trail project will have no effect on significant archaeological resources within the portions of the APE surveyed in July of 2016, and no additional archaeological investigations are recommended within the proposed project area as currently designed. Should there be any changes to the proposed project's APE, such changes will require further review in accordance with NHPA direction.

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1.0 INTRODUCTION

Lake County is proposing to construct 240 miles (mi) (386 kilometers [km]) of all-terrain vehicle (ATV) trails for the Prospector Loop ATV Trail project in northeastern Minnesota. This project is funded by the Federal Highway Administration (FHWA) through its Federal Recreational Trail Program (FRTP). MnDOT is reviewing the project in compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (Public Law 89-665), and its implementing regulations (36 CFR 800). Section 106 requires agencies to account for the effects a project may have on cultural resources listed in or eligible for listing in the National Register of Historic Places (NRHP). MnDOT contracted Commonwealth Heritage Group (Commonwealth) to conduct a Phase I archaeological survey within the area of potential effects (APE) for a portion of of the proposed project in St. Louis County, Minnesota, and for a bridge replacement in Lake County, Minnesota (Figure 1.0-1). This report presents the results of the Phase I archaeological investigations.

1.1 PROJECT DESCRIPTION

Planned trail segments are located in east-central St. Louis County, Minnesota (Figure 1.1-1a-f). These branching trails are located south and southeast of Lake Vermillion. The southeastern terminus of the 2016 trail survey is located north of Island Lake and Fishing Lakes. From here, the surveyed trail divides into two branches: one eastern and one western. The eastern branch runs north and connects with a former Duluth, Missabe and Iron Range Railway grade. The trail continues west along this grade for about 745 feet (ft) (227 meters [m]). The western branch runs west and then north to a point on the southwest side of Tower. A short extension near Little Birch Lake connects the trail to North Hayland Road. A short, separate trail segment is located just east of Purvis Lake, extending north from the Birch River 0.9 mi (1.5 km).

The project APE also includes nine bridge installations or replacements. Eight are located in St. Louis County and seven of these are located along the trail routes described above (Figure 1.1-1). The ninth is located to the southeast, and crosses the Birch River just northwest of Babbitt (Figure 1.1-2). The tenth bridge replacement comprises the portion of the 2016 survey in Lake County, Minnesota. This is located in the southern part of the county on the Manitou River (Figure 1.1-3).

The APE of the Prospector Loop ATV Trail Project includes a 25-ft (7.6 m) wide corridor. For the purposes of archaeological investigations, a corridor 50 ft (15 m) wide, extending 25 ft (7.6 m) on either side of the centerline of the trail alignment was subject to pre-field background research and field survey by Commonwealth.

Prospector Loop ATV Trail
St. Louis and Lake Counties, Minnesota

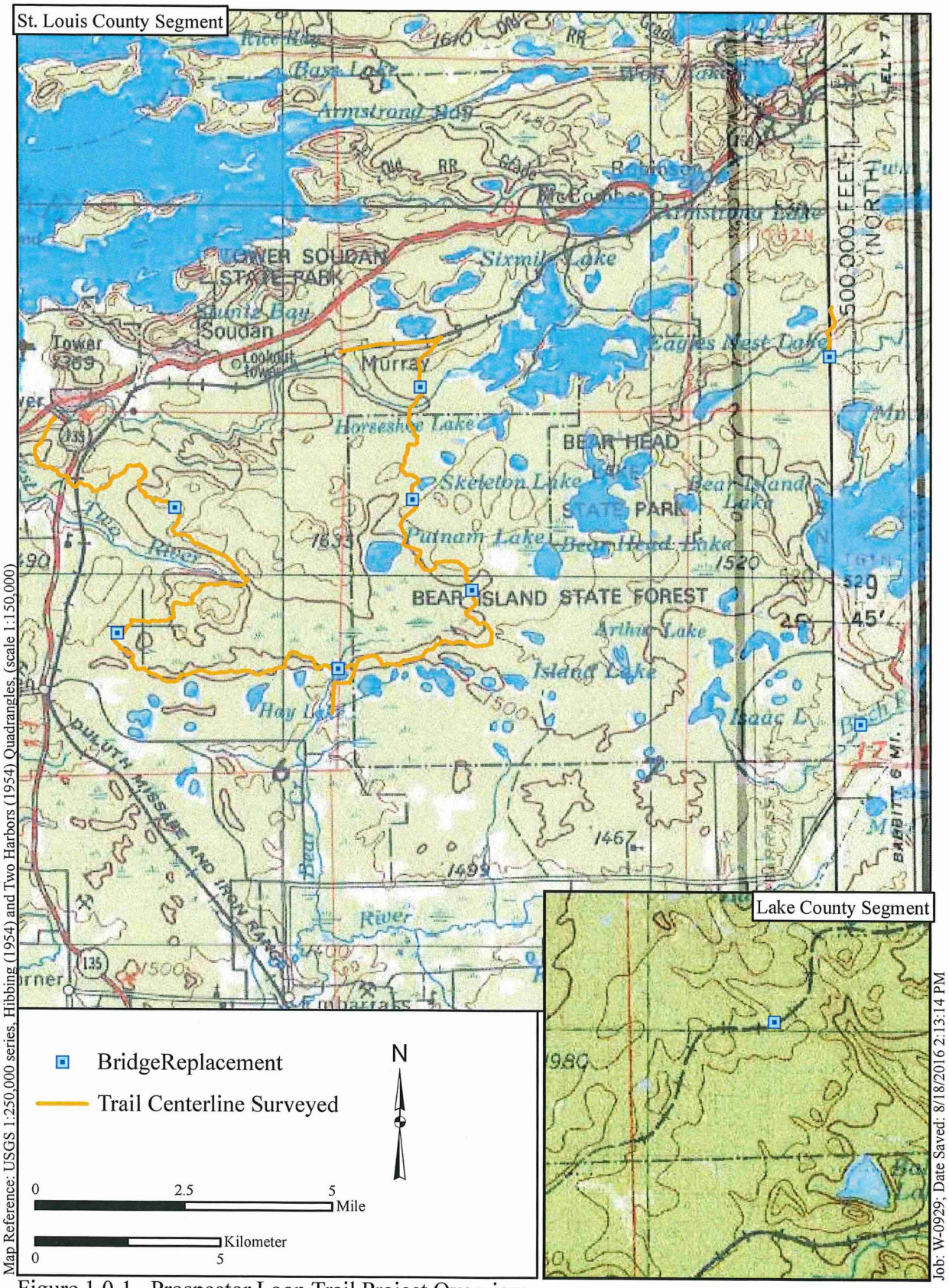

Figure 1.0-1. Prospector Loop Trail Project Overview

Prospector Loop ATV Trail
St. Louis and Lake Counties, Minnesota

Figure 1.1-1a. Project APE: Proposed Prospector Loop Trail Alignment with Previously Identified Sites within One Mile, St. Louis County, Minnesota

Prospector Loop ATV Trail
St. Louis and Lake Counties, Minnesota

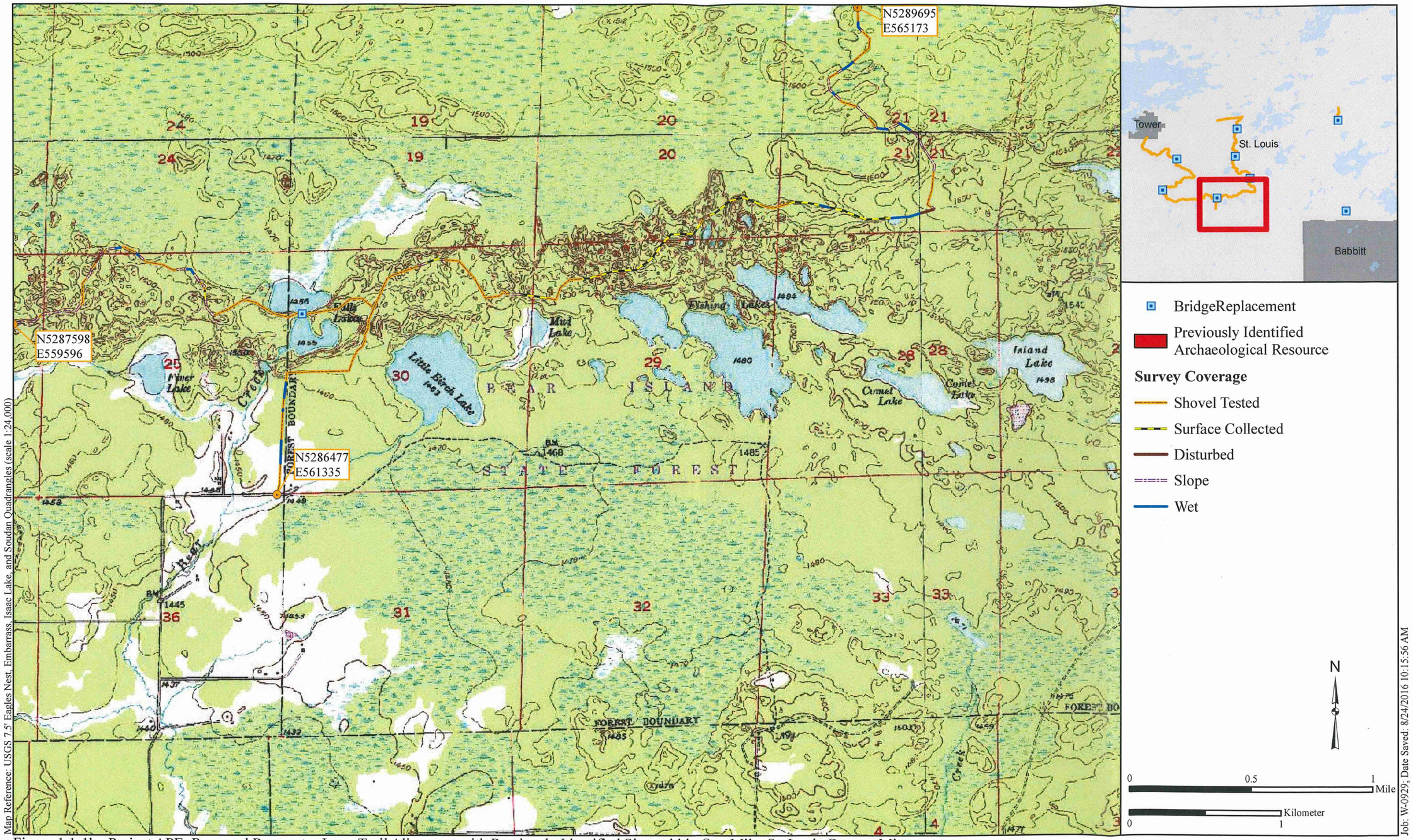

Figure 1.1-1b. Project APE: Proposed Prospector Loop Trail Alignment with Previously Identified Sites within One Mile, St. Louis County, Minnesota

Prospector Loop ATV Trail
St. Louis and Lake Counties, Minnesota

Figure 1.1-1c. Project APE: Proposed Prospector Loop Trail Alignment with Previously Identified Sites within One Mile, St. Louis County, Minnesota

Prospector Loop ATV Trail
St. Louis and Lake Counties, Minnesota

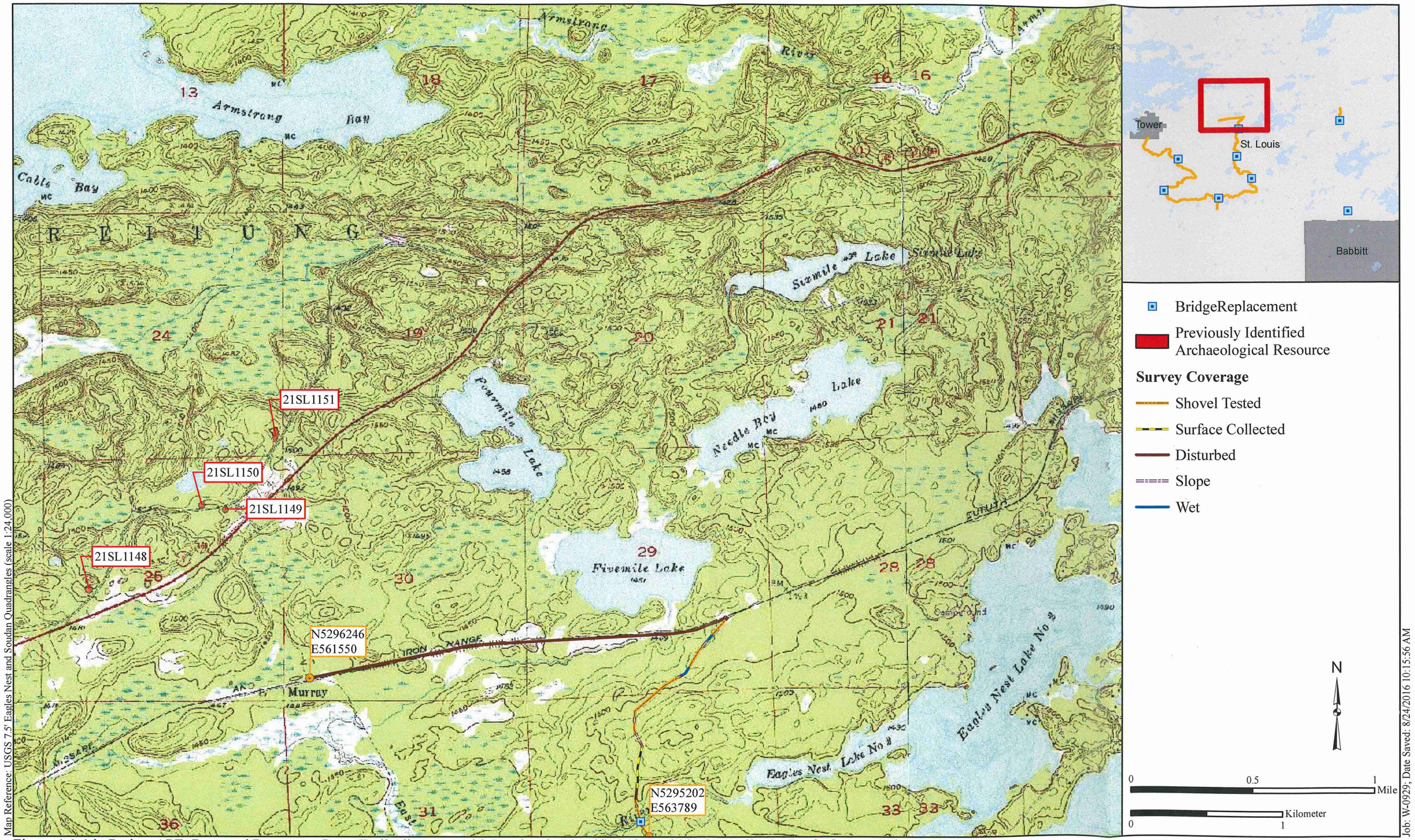

Figure 1.1-1d. Project APE: Proposed Prospector Loop Trail Alignment with Previously Identified Sites within One Mile, St. Louis County, Minnesota

Prospector Loop ATV Trail
St. Louis and Lake Counties, Minnesota

Figure 1.1-1e. Project APE: Proposed Prospector Loop Trail Alignment with Previously Identified Sites within One Mile, St. Louis County, Minnesota

Prospector Loop ATV Trail
St. Louis and Lake Counties, Minnesota

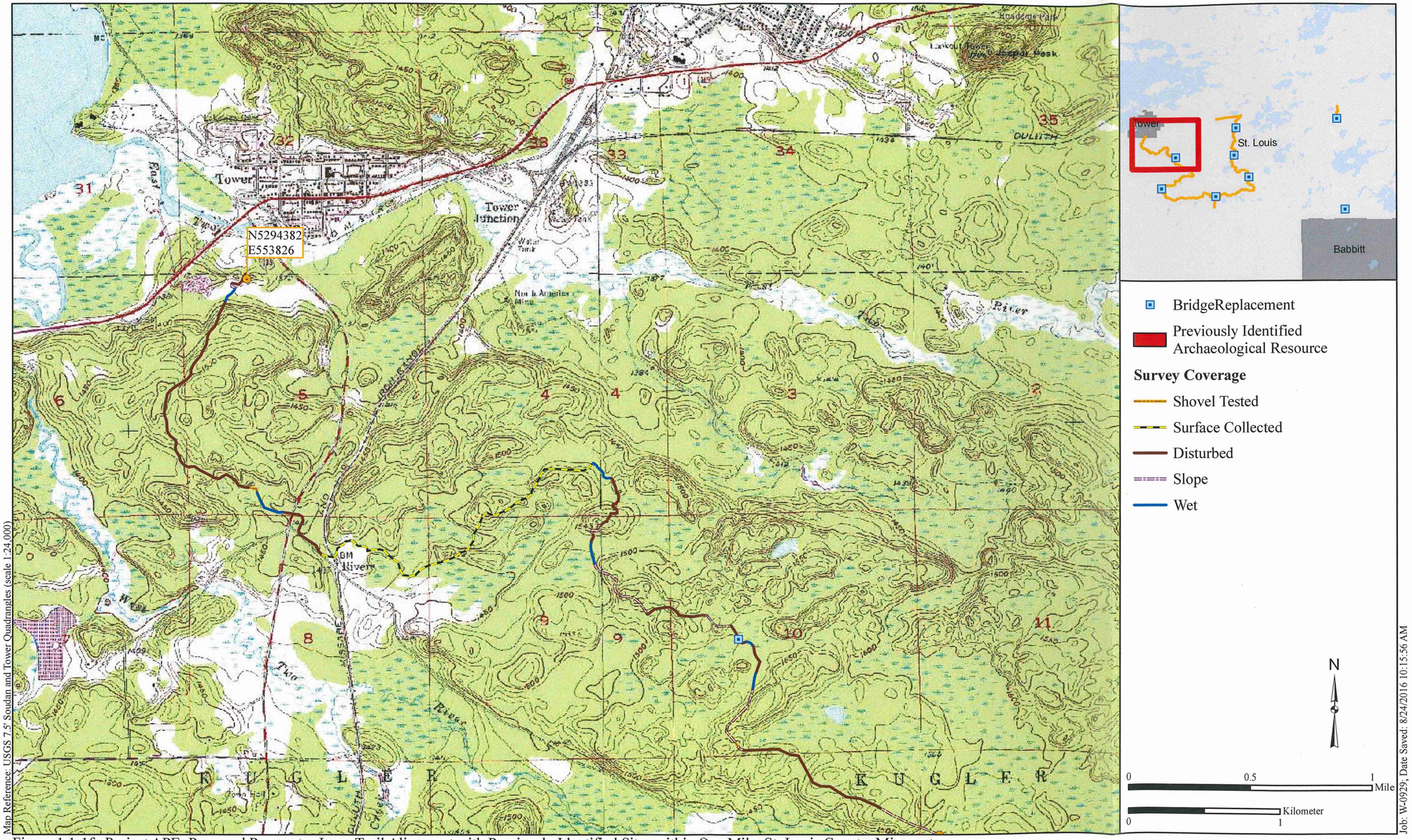

Figure 1.1-1f. Project APE: Proposed Prospector Loop Trail Alignment with Previously Identified Sites within One Mile, St. Louis County, Minnesota

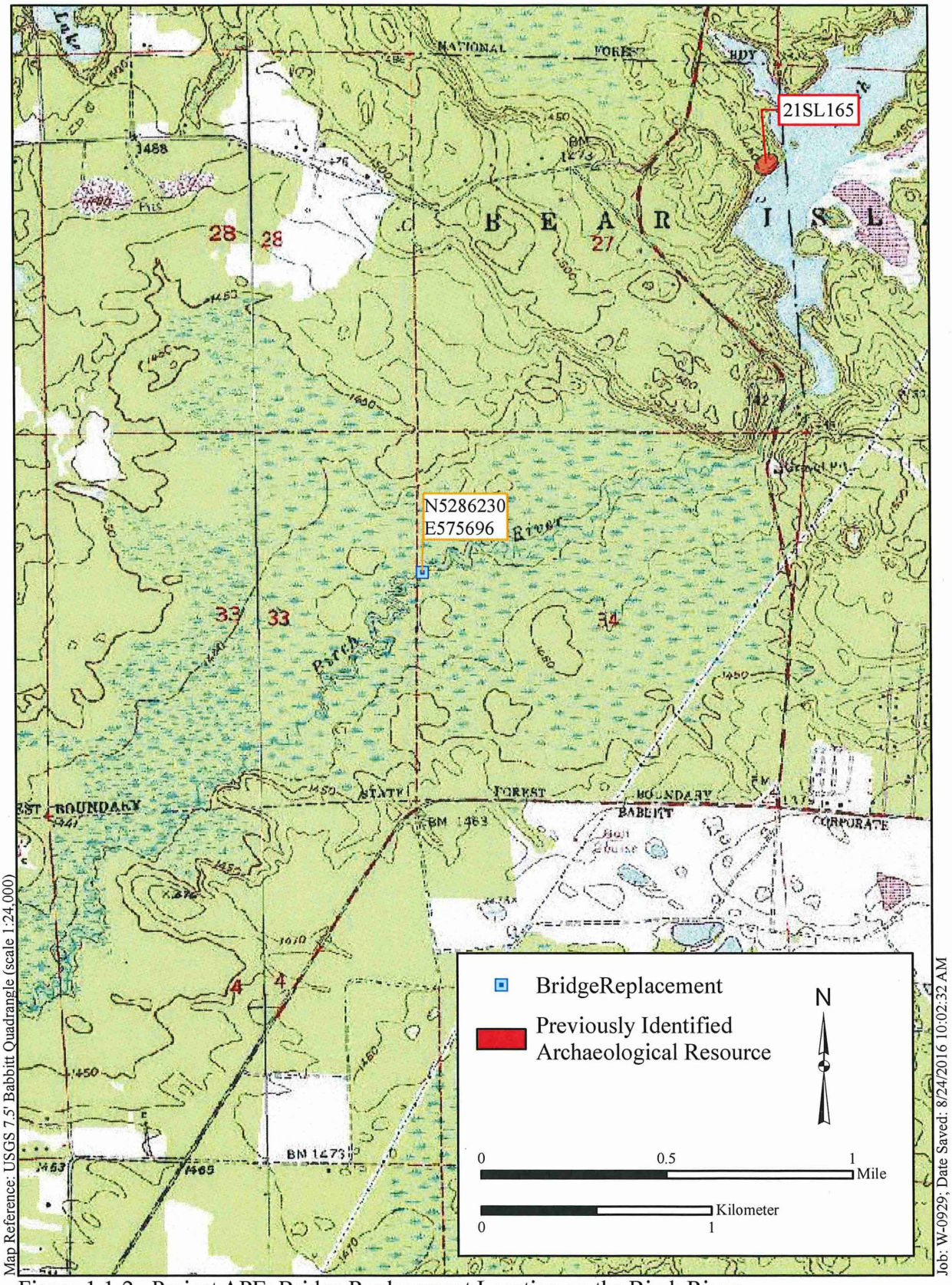

Figure 1.1-2. Project APE: Bridge Replacement Location on the Birch River, St. Louis County, Minnesota

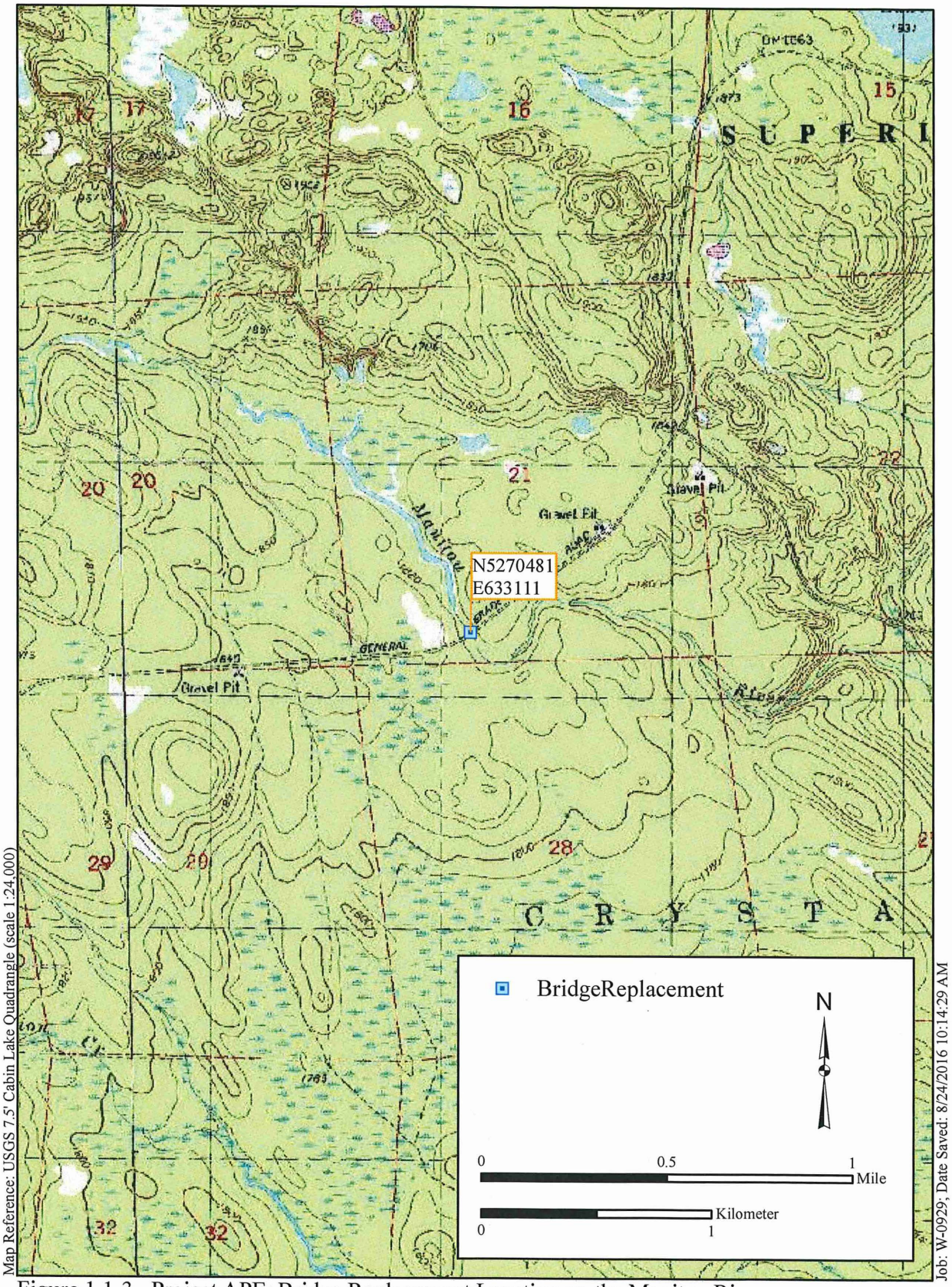

Figure 1.1-3. Project APE: Bridge Replacement Location on the Manitou River, Lake County, Minnesota

1.2 SURVEY COVERAGE AND REPORT CONTENT

Commonwealth archaeological field crews conducted the Phase I archaeological survey of the Prospector Loop Trail segments in Lake and St. Louis counties, Minnesota, between July 11 and 22, 2016. Survey of the project APE was conducted in accordance with the *Survey Manual for Archaeological Projects in Minnesota* (Anfinson 2005) and the *Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation* (National Park Service 1983). Rhiannon Jones served as principal investigator.

This report is organized into eight sections. Following this introductory section, the environmental setting of the Prospector Loop Trail project area is presented in Section 2.0. Section 3.0 contains a concise pre-contact and post-contact culture history of the project area. The archaeological literature and records review, including a discussion of previously recorded sites in the vicinity of the project APE, reviews of historic maps and aerial photographs, and of LiDAR imagery, is presented in Section 4.0. Section 5.0 discusses the specific methods employed during the course of investigations. The results of the field investigations are presented in Section 6.0, and Section 7.0 provides a summary and recommendations. References are listed in Section 8.0.

The State Historic Preservation Office (SHPO) of the Minnesota Historical Society (MHS) provided the locations of previously recorded archaeological resources near the project APE. The pre-field research was conducted by Rhiannon Jones, Elissa Hulit, and Anna McGraw. The Phase I survey was conducted under the direction of Rhiannon Jones, M.A., by a crew consisting of Jenee Gessler, John Griffin, Adam Harris, Jeff Pulvermacher, and Phillip Chaffer. Rhiannon Jones served as principal investigator, and authored the report. James Montney and Elissa Hulit prepared the graphics. Anne Lee and Alex Mattana coordinated report production.

2.0 ENVIRONMENTAL BACKGROUND

The St. Louis County portion of the project area is in the Iron Range region of northeastern Minnesota. This consists of the iron-bearing deposits of the Vermillion Range to the north of the project APE, the larger Mesabi Range to the south and southwest, and the Cuyuna range further southwest. The Vermillion Range formed in a volcanically active area during the early Precambrian about 2,700 million years ago. Iron and silica precipitated into thin bands of iron minerals and chert, which were then heavily folded and tilted (Jirsa et al. 2012; Ojakangas and Matsch 1982:25-32, 127, Figs. 3-11, 8-2, 8-4). The Mesabi Range formed later in the middle Precambrian, about 2,000 million years ago, as part of an iron deposition event that created all of the significant iron formations in the world. At this time, the composition of the formerly oxygen-poor atmosphere changed as oxygen was released as waste by algae. Iron in seawater combined with this excess oxygen and chemically precipitated as a variety of iron minerals. In the vicinity of modern Lake Superior, this occurred around the shores of a shallow sea, leaving iron formations in Minnesota and the Upper Peninsula of Michigan, as well as neighboring areas of Wisconsin and Ontario (Jirsa et al. 2012; Ojakangas and Matsch 1982:38-44, 128-131). Several types of lithic raw materials used for making chipped stone tools, collectively known as the Animikie Silicates, are part of the same geologic group as the Minnesota iron formations. Of the Animikie Silicates, Jasper Taconite was the most commonly used for stone tools in the region. This material, also called Jaspillite, is usually deep red in color and consists of iron mineral particles cemented by a transparent, "icy" chalcedonous matrix (Bakken 1995, 2011:100-104; Morrow et al. 2016:245-246).

Millions of years after the iron ranges formed, northeastern Minnesota was covered by the Laurentide continental ice sheet during the last glacial maximum. Glacial ice scoured the Precambrian bedrock and deposited layers of till and outwash atop it (Albert 1995). In St. Louis County, the Prospector Loop Trail is in the region of sediments associated with the Rainy Lobe of the ice sheet. In the project area, this is mainly ground and end moraine deposits of the Vermillion Moraine Association. These deposits include thin layers of till over glacially-scoured bedrock, and narrow moraine ridges that typically lack collapse features. To the south is undifferentiated outwash from the Rainy Lobe around what are now the Birch and Embarrass Rivers and Bear Creek (Hobbs and Goebel 1982). This outwash underlies the trail extension to North Hayland Road and the bridge replacement on the Birch River. The southern trail branch, where the trail runs east-west, is on the Wahlsten Moraine, a long, narrow feature on the north side of the outwash area formed by the Rainy Lobe around 17,350 to 16,200 calendar years before present (cal BP) (15,350 to 14,200 BC) (Dyke et al. 2003; Lehr and Hobbs 1992:13-14). This eastern portion of the moraine is hummocky and consists of unsorted sand and gravel (Erickson et al. 1971:12; Lehr and Hobbs 1992:13, Plate 1). The eastern trail branch traverses the somewhat younger Vermillion Moraine (Lehr and Hobbs 1992:14-15, Plate 1). The ice margin remained at or near the northern edges of the project area until sometime after 14,000 cal BP

(12,000 BC). Around 13,450-13,000 cal BP (11,500-11,000 BC), the shore of Glacial Lake Agassiz was as close as 11 mi (18 km) to the north of the project area (Dyke et al. 2003).

The bridge replacement in Lake County is in the region covered by the Superior Lobe of the Laurentide ice sheet. It is in an area of end moraine of the Mille Lacs-Highland Moraine Association, very close to a region of ground moraine to the southeast (Hobbs and Goebel 1982). The Superior Lobe may have retreated from this location as early as 15,200 cal BP (13,200 BC). Areas immediately to the south were covered by ice somewhat longer, becoming exposed by around 13,000 cal BP (11,000 BC). The modern Lake Superior shoreline remained covered by ice until a later date. Water levels in the Superior basin fluctuated as the ice retreated (glacial Lake Duluth). While the project area was not inundated, the lakeshore was at times about 3 mi (5 km) closer than the current distance of about 12 mi (19.3 km) (Dyke et al. 2003).

Northern Minnesota has a continental climate with warm, relatively short summers and cold winters (Albert 1995). The project area is within the Northern Superior Uplands section of the Laurentian Mixed Forest province. Within this section, the portion of the project area in St. Louis County is within both the Nashwauk Uplands and Border Lakes subsections, while the bridge replacement in Lake County is located within the North Shore Highlands subsection (Minnesota Department of Natural Resources [Minnesota DNR] 2016). The Laurentian Mixed Forest province is a glaciated area extending eastward from northeastern Minnesota across southern Ontario, northern Wisconsin and Michigan, and into New England. Vegetation across the province consists of mixed conifer and hardwood forest, with areas of conifer forest, swamp, and bog. The Northern Superior Uplands section is a rugged area with many lakes. In this region, glacial till is thin and bedrock outcrops are common, particularly near Lake Superior and in the Border Lakes subsection (Albert 1995; Minnesota DNR 2016).

Soils present in the project areas typically form on glacial features, including ground moraines, end moraines, till plains, outwash plains, drumlins, and in thin till deposits over bedrock, and also on lake plains and in alluvial settings, (United States Department of Agriculture, Natural Resources Conservation Service [USDA NRCS] 2016a, 2016b). The soils in the area of the St. Louis County trail segments are often stony and bouldery, with some rock outcrops. Mucks and peats are also common. Most of the remaining soils are sandy loams, silt loams, and loams. Frequently occurring soil series in the general area include Babbitt, Beargrease, Biwabik, Conic, Eaglesnest, Eveleth, Mooselake, Rifle, Rollins, and Shagawa. The bridge replacement on the Birch River is in an area of frequently flooded Bowstring and Fluvaquent soils along the creek bottom. Digitized soil data for the bridge over the Manitou River in Lake County is not available, but this location is likely in Bowstring and Fluvaquent soils as well (USDA NRCS 2016a, 2016b).

Presettlement vegetation in the project area in both counties consisted of aspen-birch (trending to conifers), conifer bogs and swamps, and mixed white and red pine. In St. Louis County, jack pine barrens and openings also existed in portions of the project area (Albert 1995; Marschner 1974; Minnesota DNR 1994). The bridge replacement in Lake County is in an area that was conifer bogs and swamps. At present, these regions are mostly forested, although logging has caused much red and white pine to be replaced with trembling aspen and paper birch. Unlogged areas remain in the Border Lakes subsection. Logging was occurring in the vicinity of the St. Louis County trail segments at the time of survey and the project APE passes through some recently logged areas. The region has extensive public lands with forests managed for recreation and wood products. Historically, fires have been known to impact the region regularly and are sometimes associated with periodic severe droughts (Albert 1995; Minnesota DNR 2016).

The project area is located along the Laurentian Divide and straddles the St. Lawrence and Hudson Bay watersheds. The northern and western portions of the trail segments are in the watersheds of the East Two River and the West Two River, which flow into Lake Vermillion. The lake is drained by the Vermillion River and, via the Rainy River, ultimately drains northward to Hudson Bay. The southern part of the trail segments is drained by Bear Creek. The creek is a tributary of the Embarrass River which, via the St. Louis River, drains into Lake Superior and ultimately into the North Atlantic via the St. Lawrence River. The Birch River, where one of the bridge crossings is located, and the Beaver River, representing the southern terminus of the small trail segment near Purvis Lake, both are part of the Rainy River watershed. The bridge crossing in Lake County is located on the Manitou River, which drains directly into Lake Superior. The three-way continental divide that separates the St. Lawrence, Hudson Bay, and Mississippi watersheds is located north of Hibbing, about 38 mi (61 km) to the southwest of the St. Louis County portion of the project area.

3.0 OCCUPATIONAL HISTORY

While there has long been interest in the archaeological resources of Minnesota, the exact nature of the pre- and post-contact occupations of the state remain incompletely understood. Thus, attempts to reconstruct the occupational history of the state must remain general, with a broad, regional focus. In depth syntheses of the prehistory of Minnesota may be found in Benchley et al. (1997), Dobbs (1990a, 1990b), E. Johnson (1988), Mason (1981), Wilford (1960) and Winchell (1911). The following summary of the occupational history of the project area draws on these sources as well as the culture history summary that is incorporated into the Minnesota Department of Transportation's Mn/Model statewide archaeological predictive model (Gibbon et al. 2002).

3.1 PALEOINDIAN TRADITION

The first human inhabitants of Minnesota were nomadic Pleistocene hunter gatherers referred to by archaeologists as Paleoindians (Fagan 1987; Harrison et al. 1995; Mason 1981; Pettipas and Buchner 1983). As noted above, portions of the project areas may have been ice-free by about 15,000 years ago. Glacial ice had fully retreated from Minnesota by 12,000 years ago, leaving behind a landscape very different from that of today. This post-glacial landscape consisted of open parkland with tundra-like vegetation that was home to a variety of animal life including mammoths and mastodons, as well as an extinct species of bison. Paleoindian peoples likely entered present-day Minnesota in small mobile bands as they followed migrating herds of animals browsing on the margins of the retreating glaciers. Paleoindian sites are relatively rare in Minnesota since they are typically small, contain few artifacts, and are often deeply buried beneath more recent sediments (Gibbon et al. 2002). In addition, not all Paleoindian sites have been classified as such and some have been reported by avocational collectors and lack specific information on site locations and artifact forms (Buhta et al. 2011:17).

Two broad patterns of Paleoindian materials are recognized in Minnesota: the Fluted point pattern and the Lanceolate point pattern (Benchley et al. 1997). The earliest of these patterns, the Fluted point pattern, is defined based on the presence of fluted projectile point types, such as Clovis, Gainey (or Eastern Clovis or Gainey/Clovis), and Folsom. In the American Southwest, Clovis and Folsom sites have been securely dated to 11,500-10,000 BP, a time frame that has been estimated for the Fluted point pattern in Minnesota. Gainey points are thought to be concurrent with or post-date Clovis (Benchley at al. 1997:66; Buhta et al. 2011:15-16; Morrow et al. 2016: 124-129). Based on the recovery of fluted points in direct association with the remains of extinct Pleistocene mammals, fluted point pattern people are inferred to have lived a hunter gatherer lifestyle focused on the hunting of large herd animals (Benchley at al. 1997). Clovis points are typically associated with the remains of extinct megafauna such as mammoths, mastodons, and bison; Folsom points are usually associated with the remains of extinct bison

(Buhta et al 2011:17). Fluted pattern Paleoindian sites are not especially numerous in the northeastern part of the state. Human occupation of some areas to the north, south, east, and west of the project area was prevented by glacial ice until after about 12,000 years ago and glacial Lakes Agassiz and Duluth until after about 10,200 years ago (Dyke et al. 2003). The base of a Folsom point was recovered from the Jim Reagan site (21SL875) to the north of Virginia in St. Louis County (Buhta et al. 2011:34, 46; Mulholland et al. 2001; Mulholland and Mulholland 2002). A possible Gainey point was recovered from the Bearskin Point site (21CK18) in northern Cook County (Buhta et al. 2011: 36, 46; Mulholland et al. 2007). Other Fluted pattern points have been reported from St. Louis, Cook, Itasca, Koochiching, Aitkin, and Pine counties, although the locations and point types of many have not been verified. Fluted pattern points are not known from near the Lake Superior shore or far northern St. Louis County (Buhta et al. 2011:34, 36-37, Figures 9-19).

The Lanceolate point pattern (Plano) postdates the Fluted point pattern in Minnesota and includes a variety of unfluted, lanceolate point styles. The lanceolate point pattern appears to have been a continuation and elaboration of the fluted point pattern in Minnesota as Paleoidindians adapted to environmental conditions brought on by the retreat of glacial ice from the state and the establishment of more varied vegetation patterns. The adaptive response of the Paleoindians to the changing environment is reflected in the increased regionalization of lanceolate point types, including Agate basin, Hell Gap, Alberta, Cody, Plainview, and Dalton (Benchley et al. 1997; Morrow et al. 2016:134-147).

3.2 ARCHAIC TRADITION

The Archaic Tradition in Minnesota (ca. 8000 – 3000 BP) is regarded as a time when the pre-contact inhabitants of the state undertook major changes in their adaptive strategies and lifestyles in response to concomitant changes in the post-glacial environment (Bleed 1969; Dobbs 1978; Gibbon 1996; Michlovic 1983; Phillips and Brown 1983; Shay 1971; Steinbring 1974). By the time of the Archaic Tradition, the environmental fluctuations that occurred at the end of the last glacial maximum had stabilized. Floral and faunal communities established at this time were comparable to those of the present (Benchley et al. 1997:83). The Archaic Tradition is characterized by the development of efficient strategies for the exploitation of these varied post-glacial vegetation and animal communities. An increased regionalization is seen throughout the Archaic that appears to be linked to adaptive strategies to the major biomes present in Minnesota such as the prairie, deciduous forest, and lake-forest (Benchley et al. 1997:83). This more varied subsistence pattern is reflected, in part, in a greater diversity of artifact assemblages including of large notched and stemmed projectile points, ground stone tools, and copper implements (Stoltman 1986, 1997).

The Archaic Tradition is not well represented in Minnesota, with most information derived from surface finds or private collections. Projectile point types provide the primary artifact upon which chronologies have been built, but a statewide chronological framework is currently lacking (Benchley et al. 1997:83). Despite these data limitations, four contexts have been defined for the Archaic Tradition in Minnesota based on regional Archaic traditions that appear to be present in the state: Shield Archaic; Lake-Forest Archaic; Prairie Archaic; and Eastern Archaic (Benchley et al. 1997:84-86). Of these traditions, the Shield Archaic and Lake-Forest Archaic apply to northeastern Minnesota, but neither tradition is well understood.

The Shield Archaic was a hunting gathering complex that was adapted to the closed coniferous forest of the Canadian Shield in Ontario and may represent part of the Archaic tradition in the northeastern portion of Minnesota (Benchley et al. 1997:84; Mason 1981:133-137; Wright 1972). The Lake Forest Archaic describes an adaptation to landscapes of lake and deciduous-coniferous forests of central and northern Minnesota and may have spanned a period between about 8000 and 3000 BP (Benchley et al. 1997:84-85). The Lake Forest Archaic is not well defined archaeologically, but the archaeological assemblage is known to have included notched and stemmed projectile point forms, ground stone tools, and many copper artifacts such as spear points (tanged and socketed), harpoons, and adzes. This complex spanned a time in which the prairie was expanding eastward before retreating again (Benchley et al. 1997:85; Gibbon 2012:66-72; Steinbring 1974). Benchley et al. (1997:85) suggest there was a hiatus between the early and late Lake-Forest Archaic due to prairie expansion. Lake levels were also fluctuating during this time and Lake-Forest Archaic sites may have been submerged or obliterated by rising lake levels and meandering rivers (Benchley et al. 1997:85).

3.3 WOODLAND TRADITION

Woodland cultures in Minnesota can be divided into Initial Woodland (ca. 500 BC - AD 500) and Terminal Woodland (ca. AD 500-1650) time periods (Gibbon et al. 2002) Early, Middle, and Late Woodland have also been used as well as the post-Woodland division of Late Prehistoric (ca. AD 900-1650) (Benchley et al. 1997:124, 167). The hunter-gather lifestyle of the Archaic appears to have persisted into the Initial Woodland, which is marked by the earliest appearance of pottery and the construction of earthen burial mounds (Anfinson 1987; Benn 1979; Gibbon 1990; Hudak 1974; Lugenbeal 1976; Stoltman 1973). Although earthen mound construction and the production of pottery are the two hallmarks of the Woodland tradition, these innovations do not appear to have been adapted in all areas of Minnesota at the same time, or even together (Benchley et al. 1997; Gibbon et al. 2002). In most parts of the state, there appears to have been an overlap in time between Late Archaic and early Initial Woodland cultures.

Possibly the earliest form of pottery in northern Minnesota (Initial or Early Woodland) is Brainerd Ware, first appearing as early as 2750 years ago (Arzigian 2008:21; Hohman-Caine and Syms 2012:75). Brainerd Ware pots were formed first by coiling and then by final shaping

within a net bag, which left distinctive net impressions on the exterior surface. They tended to be made from naturally sandy clay, but occasionally grit temper was added (Hohman-Caine and Syms 2012:4-5, 14-15, 16-19, Figures 1, 3-7, 11). In Minnesota, this ceramic type occurs in the north-central part of the state, particularly in Beltrami, Cass, Clearwater, and Wadena counties. These ceramics are found along the Canadian Border, and in Manitoba the name Rock Lake Net-impressed is applied to what appears to be the same ceramic type (Arzigian 2008:Figure 3; Hohman-Caine and Syms 2012:25-26, Figure 14). Associations between Brainerd Ware ceramics and projectile point types is uncertain, but points recovered from potential Brainerd Ware contexts are of a size for use as darts and small points for use on arrows are lacking. Besant and Oxbow points, both small to medium side-notched types, may occur in Brainerd Ware Contexts (Hohman-Caine and Goltz 1995:122; Hohman-Caine and Syms 2012:63-64; Morrow et al. 2016:174-175, 198-199).

The Laurel complex can be considered to signify the Middle Woodland or late Initial Woodland in northern Minnesota (Arzigian 2008:53). Laurel is characterized by an adaptation directed toward systematic procurement of aquatic resources. Evidence of Laurel culture is known from the edge of the Great Plains to the Lake Superior region and as far north as the boreal forests of Canada, where it represents the earliest known ceramic technology in the region (Arzigian 2008:53-62; Benchley et al. 1997:134; Buchner 1979:103-104, 1983:153, 158; Stoltman 1973). The Laurel complex is estimated to date to between 200 BC and AD 800, but may have persisted in Canada until several centuries later (Arzigian 2008:54-55, Figure 9; Dobbs 1990a). Laurel ceramics are grit-tempered and smooth-surfaced with a variety of possible decorative impressions applied to the upper part of the vessel, including multiple dentate stamping techniques. Assemblages also include side- and corner-notched projectile point such as Whiteshell Side-Notched and the un-notched Laurel Triangular (Anderson 1979:121; Benchley et al. 1997:114; Bowe 1999: 8-81; Buchner 1979; Dobson 1994:54; Hamilton 2009:133-135; Lugenbeal 1976, 1979; MacNeish 1958:33-36). In the Upper Great Lakes, Laurel ceramics have been found in association with native copper and, on some occasions, exotic obsidian (Buchner 1983:158).

In northern Minnesota, the hunter-gatherer lifestyle and cultural innovations of the Initial or Early Woodland persisted, but Late/Terminal Woodland people began to increasingly supplement this hunter-gatherer subsistence base with wild rice harvested from the region's lakes and rivers. From this point forward, wild rice would become a central component of the subsistence base of both the pre- and post-contact native people of northern Minnesota. Perhaps owing to a more stable subsistence base provided by wild rice, the population of northern Minnesota appears to have risen dramatically during the Terminal Woodland (Benchley et al 1997:126-127; Gibbon 1994; Gibbon and Caine 1980; Gibbon et al. 2002). Major changes in ceramic styles and other artifact forms, such as the adoption of the bow and arrow, in addition to changes in settlement patterns are also seen at this time. The geographic distribution of

distinctive ceramic types, artifact styles, and burial practices during the Terminal Woodland have enabled archaeologists to identify distinct archaeological cultures in northern Minnesota, including Blackduck, Kathio, and Psinomani (Benchley et al. 1997:126-127, 134-135, 177-179; Gibbon et al. 2002).

The Late/Terminal Woodland Blackduck culture has a similar spatial distribution to Laurel, occurring across the northern half of Minnesota and portions of Manitoba, Ontario, and the Upper Peninsula of Michigan. In Minnesota, Blackduck sites are particularly numerous in the Rainy Lake area along the Canadian border and in the Mississippi headwaters area. Estimates of the beginning of the temporal range vary between AD 600 and AD 800, and the end is placed between AD 1000 and AD 1400 (Arzigian 2008:109, Figure 26; Benchley et al. 1997:135; Gibbon 2012:187; Lugenbeal 1979). In central Minnesota and northwestern Wisconsin, Blackduck (particularly early Blackduck) has been combined with Kathio or both Kathio and Clam River ceramics to represent a wider continuum of complexes (Anfinson 2006; Arzigian 2008:109-112; Gibbon 2012:185). Typical Blackduck vessels are globular with thickened lips and flaring orifices. Surfaces may be cordmarked or fabric-marked depending on whether a paddle-and-anvil modeled or fabric molded technique was used to construct the vessel. Decoration occurs on the neck and lip and consists of cord-wrapped tool impressions, together with either circular punctates or bosses (Hamilton 2009:136; Lenius and Olinyk 1990:79; Lugenbeal 1979:30-32). Other artifacts characteristic of the Blackduck culture include small triangular and side-notched projectile points, steatite and clay pipes, and harpoons. The subsistence adaptation of the Blackduck culture is characterized by hunting and gathering, with a focus on warm-season fishing and use of wild rice. Blackduck sites also commonly include burial mounds (Benchley et al. 1997:134-135; Lugenbeal 1979:24; Morrow et al. 2016:226, 340).

The Psinomani complex (AD 1100 to 1750), also called the Wanikan culture, represents a Terminal Woodland to early Contact-era culture in northern Minnesota (Arzigian 2008:126-147; Gibbon 2012:189-192; Hamilton 2009:137-138). Known Psinomani sites occur across northern Minnesota, particularly in the Mississippi headwaters area and the Rainy Lake area, as well as in the Mille Lacs area (Arzigian 2008:126-127, Figure 18). The complex is distinguished in part by the presence of Sandy Lake ceramics, although it is not considered to be coterminous with Sandy Lake ceramics, which have a broad distribution similar to Laurel and Blackduck (Arzigian 2008:126-127; Birk 1979; Cooper and Johnson 1964; Gibbon 1994:146; Taylor-Hollings 1999:8, 81-85, 266). Sandy Lake ware can be tempered with either shell or grit and in northern Minnesota, shell temper is diagnostic of Sandy Lake ware. In Canada, shell-tempered Sandy Lake pottery is unusual (Arzigian 2008:130-131; Hamilton 2009:137; Taylor-Hollings 1999:47). Another ceramic type, Ogechie, a local form of Orr phase Oneota pottery, is also associated with Psinomani complex sites, indicating connections with populations to the south (Arzigian 2008:126-127; Ready and Anfinson 1979). Other artifacts include small, triangular projectile

points, often of quartz (Arzigian 2008:126; Gibbon 2012:189-190). The Psinomani complex is thought to have been produced by Siouan-speaking peoples, and has been associated with the historic Mdewakanton Dakota in the Mille Lacs area in east-central Minnesota (Arzigian 2008:126, 129; Participants of the Lake Superior Basin Workshop 1988). Arzigian (2008:129) states that "In the Mille Lacs area, the end date for Psinomani seems to be based on the historic record for the displacement of Dakota peoples by Ojibwe peoples at 1750." Also in the Mille Lacs area, Sandy Lake and Ogechie pottery has been found in association with post-contact French artifacts, which can date to before the arrival of the Ojibwe (Arzigian 2008:129).

It is during the Woodland that archaeologically-identifiable regional identities first appear. Although connections between these late pre-contact archaeological expressions and known historic ethnic groups remain tenuous at best, these newly emergent cultures mark the appearance of the cultural patterns of the Dakota and other Native American societies as they were on the eve of European-American contact (Benchely et al. 1997:127; Gibbon et al. 2002). The early European explorers who visited northern Minnesota in the seventeenth-century were met by groups practicing a Terminal Woodland lifestyle (Arzigian 2008:126, 128-129; Benchely et al. 1997:178; Gibbon et al. 2002).

3.4 POST-CONTACT

The Post-Contact period in Minnesota was ushered in with the arrival of Europeans. The earliest Europeans to have traveled to Minnesota are generally believed to have been the French explorers and fur traders Sieur de Radisson and his brother-in-law Sieur des Groseilliers (Adams 1961; Folwell 1956; Nute 1978). Although there is some debate over the date of their arrival, it is believed that they entered Minnesota at Cross River in 1659 or 1660 (Lass 2000). Radisson and Groseilliers were the first Europeans to visit the Dakota of Minnesota, paving the way for the opening of trade with the dominant Native American group in the state at the time (Gibbon et al. 2002). The exploration and initial forays into Minnesota by Radisson and Groseilliers initiated the French period in Minnesota, which lasted into the early 1760s (Folwell 1956:1-52).

The French Period in Minnesota is marked by the establishment of an extensive trade network that accompanied the construction of posts and forts throughout the state. For nearly 100 years, the French controlled the lucrative fur trade throughout Minnesota and the western Great Lakes. French forts were established on Lake Superior. North of the project area, French officer, trader, and explorer Pierre Gaultier de Varennes, sieur de La Vérendrye, and his sons established forts on Rainy Lake (Fort St. Pierre) and Lake of the Woods (Fort St. Charles) in the 1730s (Burpee 1927; Champagne 1963). Control over the North American fur trade contributed to the development of hostilities between France and England that culminated in warfare between the two colonial powers in North America. The French and Indian War lasted in North American from 1754 to 1763, pitting the French and their Native American allies (consisting mainly of

Algonquian speaking groups) against the English, their American colonists, and their Native American allies (primarily Iroquoian groups). The war was officially concluded in 1763 with the Treaty of Paris, which transferred most of the French holdings in North America to the British Empire.

Concurrently, the Native American population dynamics of Minnesota underwent a fundamental transformation as Ojibwe groups from Wisconsin began moving into the lake region of northern Minnesota. By 1800, these Ojibwe groups had effectively gained control of the lakes and forests of northern Minnesota, driving south along the Minnesota River valley and westward into the Dakotas (Gibbon et al. 2002). Vérendrye reported an Ojibwe presence at what was probably the Lake Vermillion area (possibly along what is now the Pike River) in 1736. The French were trading with the Ojibwe there as they were at Rainy Lake. Vérendrye also reported on the conflict between the Dakota and the Ojibwe (Burpee 1927:238; Lamppa 2004:19-20, Tanner et al. 1987:29, 65, Map 9).

The signing of the Treaty of Paris of 1763 may mark the beginning of the British Period in the western Great Lakes region, but it did not end the influence of the French traders, many of whom had intermarried with the Native American inhabitants of the region. To strengthen their hold on the former French holdings in North American and wrest control of the fur trade from the French, the British began constructing forts and posts in the western Great Lakes. The British fur trade was dominated by the Hudson's Bay Company and the Northwest Company. The Northwest Company established a trading post at Lake Vermillion around 1800. Ojibwe villages were located on the lake and the nearby Pike River at this time (Lamppa 2004:19-24; Tanner et al. 1987:Map 20). The American Fur Company entered the scene not long after. The project area was in the region contested by the America Fur Company and the Hudson's Bay Company (which had by now absorbed the Northwest Company). An American Fur Company trading post was established at Lake Vermillion in 1821 by a disgruntled former Northwest Company employee. This led to fierce competition between the two companies in the area. Between 1833 and 1847, by agreement, the two companies maintained a border not far south of Lake Vermillion, with the Hudson's Bay Company controlling the area north of the boundary and the American Fur Company remaining closer to Lake Superior (Lamppa 2004: 20, 29-30).

The British Period in Minnesota was short lived, lasting until the close of the American Revolution with the Treaty of Paris of 1783. The Revolutionary War Era was a time of great upheaval in Minnesota for both the Euroamerican traders and their Native American trade partners (Benchley et al. 1997).

The French and British Periods in North America had profound impacts on the traditional life ways of the Native Americans living in Minnesota and the western Great Lakes. These impacts included: (1) an influx of native peoples from the east, who were drawn to the western Great

Lakes by trade opportunities or driven to the region by the Iroquois wars; (2) catastrophic depopulation of native peoples in some areas because of warfare and newly introduced diseases; (3) a switch from hunting for subsistence to hunting for trade; (4) a gradual movement southward and westward by the Dakota, and the movement into northern Minnesota by the Ojibwe; and, (5) the near complete replacement of many Native American manufacturing materials (e.g., stone, pottery, bone) by European materials (e.g., copper, brass, iron, glass, porcelain) and the loss of traditional crafts and technologies (Gibbon et al. 2002).

The Americanization of Minnesota began with Zebulon Pike's 1805-1807 exploratory expedition through the state and culminated with the 1819 establishment of Fort Snelling at the junction of the Minnesota and Mississippi rivers. Fort Snelling was not only a powerful symbol of American might, but also served as the administrative center of both United States military and government operations in the region (Hall 1987; Pike and Coues 1895; Ziebarth and Ominsky 1970). In the years following the end of the War of 1812, Euro-American settlers began entering into Minnesota in increasing numbers. The Minnesota Territory was established in 1849 with Alexander Ramsey named as the first Territorial Governor. At the time of its establishment, most of the settlement of the Minnesota Territory was concentrated in a roughly triangular area framed by the Minnesota, St. Croix, and Mississippi rivers (Benchley et al. 1997). Settlement outside of this area increased as Native American land cessations and the expansion of roads opened the interior portions of the state for settlement.

Land in Minnesota Territory was officially opened for settlement in 1853, and by 1855 an estimated 40,000 people had settled in the territory. By 1857 the number of settlers in Minnesota had grown to 150,000 (Benchley et al. 1997). In 1858, the Minnesota Territory was admitted to the Union as the thirty-second state (Gibbon et al. 2002). The influx of settlers to the new state led to increased conflict between the new arrivals and the region's Native American populations. In 1862 tensions between settlers, the United Sates Government, and the Dakota resulted in the Dakota Uprising of 1862. The Dakota Uprising lasted for several months and took the lives of hundreds of settlers, soldiers, and Dakota before it was ultimately quashed by the United States Army. The net result of the uprising was the mass execution of 39 of the Dakota warriors involved in the uprising and the expulsion of the Dakota from Minnesota. Many Dakota later returned to the state, but were relegated to reservations.

Meanwhile, in the project area, the fur trade had returned to American control, although now through independent traders following the dissolution of the American Fur Company. At this time, the population of the Lake Vermillion area was primarily Bois Forte Ojibwe, who in addition to hunting and foraging, also cultivated potatoes by the lake and visited the trading post. The area was regarded as Bois Forte property not only by the Bois Forte themselves, but by at least some at the Bureau of Indian Affairs. This was in spite of the 1854 Treaty of La Pointe, in which the Ojibwe were supposed to have ceded the Lake Vermillion area to the U.S.

government, but which the Bois Forte denied agreeing to and didn't recognize (Lamppa 2004:31-33, 39-40). As discussed below, by the 1860s Euroamericans were arriving in the area to prospect for gold and other minerals and this led to tensions with the Bois Forte. As far as the Minnesota government was concerned, Lake Vermillion had been ceded in 1854, but there was concern over another conflict akin to the Dakota Uprising. A new treaty, the Bois Forte Treaty, was signed in 1866, and the area was ceded by the tribe and opened to surveyors and prospectors (Lamppa 2004:31-33, 39-42). An area on the lakeshore would later become a small Bois Forte Ojibwe reservation, in addition to two reservations elsewhere. The project area is not within the bounds of this reservation, but it has been and continues to be used by members of the Bois Forte band (B. Latady, personal communication, July 15, 2016).

To the south of the project area, the Minneapolis-St. Paul metropolitan area developed and grew significantly in population during the 1800s. Minneapolis became a commercial and industrial center focused on milling flour from wheat shipped in by railroad from the agricultural regions of the state. St. Paul, meanwhile, grew as an administrative and commercial center, and became the seat of state government following the admission of Minnesota into the union (Benchley et al. 1997; Folwell 1969:480; Kane 1987; Swanholm 1978:10). Duluth became an important city in the Lake Superior region as the mining and logging industries got underway. The city provided a port with access to the entire Great Lakes region and the Atlantic Ocean, as well as, in time, railroad access to the interior of the continent.

3.4.1 The Minnesota Iron Range and the Iron Ore Industry

As discussed in Section 2.0, the portion of the project area in St. Louis County is in the Minnesota Iron Range. This region gained great economic importance in the late 1800s as a major source of iron ore in the United States. The trail segments occupy the gap between the Mesabi and Vermillion iron ranges. Commercial iron mining in the Lake Superior region had begun in the Upper Peninsula of Michigan, first on the Marquette Range in 1854. Michigan was the foremost state for iron production until succeeded by Minnesota in 1901 (Virtue 1909:338).

In Minnesota, iron mining was preceded by gold and silver prospecting in the Lake Vermillion area. Born to a large degree of rumor and speculation, a gold rush occurred here in 1865 and 1866, but the area proved to contain no gold in a form that could be extracted by prospectors. The rush left the area dotted with exploratory pits (Lamppa 2004:33-38, 42-43; Ojakangas and Matsch 1982:147-148; Walker 1974). The Vermillion Road, a rough trail from Duluth to Lake Vermillion, likely following existing Native American trails, was created as a result of this rush in the spring of 1866 (Ojakangas and Matsch 1982:147; Stebbins and McPherson 1883; Stutnz 1882a, 1882b, 1885).

By this time, iron had been noted in the vicinity of Lake Vermillion (Clark 1865; Eames 1866:6, 18, 31; Lamppa 2004:33; Leith 1903:25-26; Walker 1974:44; Whittlesey 1866; Zellie 2005:1-9). Indeed iron pyrite "fool's gold" may have contributed to the belief the area harbored gold (Chester 1884:167). Mentions of iron were included in reports by Thomas Clark, assistant to Minnesota's first state geologist, Augustus Hanchett, and Hanchett's successor Henry Eames, whose 1865 fieldwork precipitated the gold rush. Several new expeditions to the Iron Range area were organized in the 1870s to investigate the potential for iron mining. One of these, conducted by geology professor Albert Chester in 1875, was commissioned by Pennsylvania businessman Charlemagne Tower. Iron in the Mesabi Range had been sparking interest, enough that a group of investors had begun organizing to build a railroad to connect the Mesabi Range to Duluth, but Chester concluded the iron deposits in the area consisted of only "lean ore," a very hard, low-grade ore later dubbed "taconite." The Mesabi Range would eventually prove fruitful, but for the time being, the best ore was thought to be in the Vermillion Range (Chester 1884; Lamppa 2004:47-53; Ojakangas and Matsch 1982:147, Winchell 1893:113-114).

Commercial iron mining in Minnesota was first accomplished by the Minnesota Iron Company, incorporated in late 1882 and producing its first shipment of iron in the summer of 1884. Company president Charlemagne Tower, with the assistance of the Minnesota state legislature, a government surveyor, and others, was able to acquire iron-rich land around Lake Vermillion. He was aided by the knowledge that the government would look the other way over such things as hiring professional homesteaders in order to bypass preemption rules. The townsite of Tower, near the shore of Lake Vermillion, was platted beginning in 1882 and construction began on housing and mining infrastructure (Lamppa 2004:54-58). Tower needed a railroad to transport ore to Lake Superior for shipment to steel mills further east. He gained control of the Duluth and Iron Range Railroad, a stalled venture that had been initiated in 1874 during the early exploratory period in the Iron Range. Construction finally began on this railroad line in 1883 and the line was completed along a 68 mi (109 km) route between Tower and Two Harbors, on Lake Superior, in late July of 1884. The very next day, the first rail shipment of ore out of the Iron Range was made from the Minnesota Mine complex (later the Soudan Mine) near Tower (W. W. Hixson 1916; King 1972:17-26; Lamppa 2004:62-64; Stuntz 1885; Virtue 1909:338-339). Despite financial success, Charlemagne Tower was forced to sell his mining company and railroad to competitors in 1887 (King 1972: 29-31; Lamppa 2004:65-66). Numerous other mining companies sprang up across the Vermillion Range in the late 1880s, although the most productive mines producing the most valuable ore were located near the communities of Tower and Soudan and to the northeast near Ely (Lamppa 2004:71-73).

Initially passed over by commercial operations, the Mesabi Range had its champions and after further prospecting, "soft" hematite ore was discovered at what is now Mountain Iron in 1890. This set off a wild period of prospecting and land speculation in the early 1890s (Lamppa 2004:108-114, Winchell 1893:113-114; 166-172). The Duluth, Missabe, and Northern Railway,

a line from Mountain Iron with connections to Duluth and Superior, was constructed in 1892 (King 1972:45-48). Later, in 1938, this railroad would merge with the Duluth and Iron Range Railroad to form the Duluth, Missabe, and Iron Range Railway. By this time, branches had been added to Ely in the Vermillion Range and to numerous points in the Mesabi Range (King 1972:118-119). As the ore in the Mesabi Range was near the surface, open pit mining was employed, resulting in enormous pits, including the Hull-Rust-Mahoning Mine near Hibbing, which was once the largest open pit mine in the world (Lamppa 2004:146; Snell 1966). Taconite mining, discussed below, also results in massive pits. Open-pit mining on the Mesabi Range has transformed the topography of the range, creating new lake basins in abandoned mine pits and altering drainage patterns on the south edge of the range (Lively et al. 2002, 2005; Zellie 2005:1-4). Initial mining in the Vermillion Range had used open pits as well, but miners soon turned to digging underground shafts, leaving this range less visibly scarred than the Mesabi (Lamppa 2004:66-68).

Although the Iron Range produced a significant amount of iron during World War II, the "soft" ore was running out. That left only the hard, low-iron taconite. Experimental attempts to process taconite into a more concentrated form of iron that could be used for smelting were conducted in the 1910s and the first taconite processing plant was constructed beginning in 1920. This was located at the eastern end of the Mesabi Range and the new town founded to support the plant and its associated mine was named Babbitt. Changes in the steel industry, however, meant that the processed taconite could not compete with natural ores—even ones with lower iron content—and the Babbitt plant closed in 1924. As the ore reserves dwindled, additional experimentation by the University of Minnesota Mines Experiment Station over the next two decades eventually resulted in the development of a marketable form of refined taconite pellets (Lamppa 2004:228-234).

The first full-scale plant to produce taconite pellets was constructed at Silver Bay on the Lake Superior shore, just over 19 mi (30.6 km) south of the bridge replacement location in Lake County (Lamppa 2004:236). The plant, operated by the Reserve Mining Company, began production in 1956. Silver Bay was founded as a company town to support the plant and construction of the town commenced in 1951. This planned community began as the "Beaver Bay housing project" after the nearby community of Beaver Bay and was named "Silver Bay" in 1954 (City of Silver Bay, Minnesota n.d.; Lamppa 2004:236).

In addition to mining, the region saw widespread logging in the late 1800s and early 1900s. Lumbering had already become an important industry further south, with the first commercial sawmill in the state established on the St. Croix River in 1839 (Folwell 1956:356). Winton, to the northeast of the project area, was founded as a center of logging interests in the eastern Iron Range region (Lamppa 2004:94-100). Logging in northeastern Minnesota had begun earlier in the vicinity of Beaver Bay on Lake Superior. Here, a sawmill was established in the 1850s and

logging occurred upstream from the lakeshore along the Beaver River (Lamppa 2004:46). Much of the project area in St. Louis County had been logged in the recent past, as field crews observed numerous stumps and young trees with fewer old trees present. Following the depletion of timber in northeastern Minnesota, Superior National Forest was founded to the northeast of the project area in 1909, ushering in the contemporary period of conservation and recreation in the region (Lamppa 2004:100-101).

While the project APE does not fall within the areas of the Vermillion or Mesabi ranges that have experienced intensive iron mining, iron ore industry sites may occur in the area. These could be in the form of prospecting pits and drill holes, exploratory camps, and transportation features such as trails, roads, and rail grades built to serve the mining regions to the north and south (Zellie 2005:1-16 – 1-20, 3-46 – 3-48). Logging camps and logging associated transportation features may occur as well. Due to the lack of commercial mining in the project APE, such late 19th and early 20th century features have a better potential to be preserved here than to the south in the Mesabi Range, where the landscape has been radically altered.

3.5 PRESENT LAND USE

At present, the project APE is primarily within state and county lands that are used for recreation. Public lands in the area are interspersed with private residential and recreational property. The APE overlaps Bear Island State Forest and is near Bear Head Lake State Park and Lake Vermillion-Soudan Underground Mine State Park. Numerous trails cross the project area, including trails intended for snowmobiles, skiing, and hiking. Much of the project APE follows existing trails.

4.0 ARCHAEOLOGICAL LITERATURE AND RECORDS REVIEW

Prior to the 2016 archaeological field survey, a literature and archival review of the project area was conducted to assess the archaeological and architectural/historic sensitivity of the study area. This review identified archaeological and burial sites within a 1.6 km (1 mi) wide study area surrounding the centerline of the planned trail segments. Pre-field research consisted of a review of Minnesota archaeological site files maintained by the SHPO at the MHS. A list of sites within 1.6 km (1 mi) of the project APE was provided by MHS and copies of the relevant site files were obtained by Commonwealth staff. Historic plat maps available at the Minnesota History Center library in St. Paul were also reviewed, as were historic aerial photographs available through Minnesota Historical Aerial Photographs Online from the John R. Borchert Map Library at the University of Minnesota. Original public land survey plats produced by the Government Land Office were obtained from the Minnesota Geospatial Information Office website and associated survey notes were obtained from the Bureau of Land Management Official Federal Land Records website. Finally, LiDAR data obtained from the USDA NRCS Geospatial Data Gateway website was examined for potential cultural features prior to field survey.

4.1 PREVIOUSLY RECORDED SITES

No previously recorded archaeological sites intersect the project APE. There are four previously identified archaeological sites within 1.6 km (1 mi) of the centerline of the proposed trail segments in St. Louis County (Figure 1.1-1d). No previously identified archaeological sites are within 1.6 km (1 mi) of the two isolated bridge replacement locations in St. Louis and Lake counties.

In St. Louis County, previously recorded sites in the general area of the project APE include Woodland mound sites, pre-contact lithic scatters and isolated finds of undetermined context, and post-contact sites related to the iron ore industry period (1880s-1945) such as mines and prospecting pits. All four of the sites within 1.6 km (1 mi) of the trail centerline (21SL1148, 21SL1149, 21SL1150, and 21SL1151) are clusters of iron ore prospecting pits. These are located near the north end of the eastern trail segment, on the north side of Highway 1 (Figure 1.1-1d). The four sites were all identified in 2012 during field survey conducted by the Minnesota Historical Society. They are on land once owned by the Minnesota Iron Company (W. W. Hixson and Company 1914). The sites are, at minimum, 0.76 mi (1.22 km) from the northern terminus of the surveyed APE, where it coincides with the former Duluth and Iron Range Railroad grade.

Other previously recorded sites in the general vicinity of the St. Louis County segments include pre-contact lithic scatters and isolated flakes, a pre-contact chert quarry with an associated lithic scatter, additional iron ore prospecting pits (particularly in the vicinity of Lake Vermillion), and

iron ore industry period mines, including the Soudan Mine (21SL277), now part of Lake Vermilion-Soudan Underground Mine State Park. A possible mound (21SL6) was recorded in the community of Soudan in a low, marshy area west of the Soudan Mine historical marker. A 1998 visit by the Minnesota Office of the State Archaeologist identified a mound-like feature, but cast doubt on its status as a burial feature, due to its location in a low-lying area and its rocky matrix. Two other mounds might be located in an "Old Indian Cemetery" (21SL7) on a peninsula on Pike Bay, west of Tower. This site is located west of the mouth of the West Two River and north of Highway 1. The exact nature and location of this site is uncertain and no other information is available.

Pre-contact lithic scatters in the general area include 21SL165, located on the west bank of the Birch River Narrows north of Babbitt (Figure 1.1-2), and 21SL858, located on a peninsula on the south shore of Bear Island Lake. Site 21SL165 is about 1.4 mi (1.3 km) northeast of the surveyed bridge replacement location on the Birch River. Here, a crew from Hamline University in St. Paul identified cultural material on a series of three rocky ledges overlooking the river. The site was initially identified through shovel testing in 1983 and subject to further investigation later that year when seventeen formal test units were excavated. Shovel testing and excavation yielded a thumbnail scraper, six possible cores, over 200 flakes, shatter, and fire-cracked rock (FCR). Soil stains with charcoal were observed. At least some were thought to be from forest fires, but at least one, located in a test unit, was determined to have been a fire pit and contained both charcoal and FCR. At site 21SL858, a single Hudson Bay Lowland chert flake was recovered during shovel testing in 1999. Evidence of a 20th century picnic area was identified at this location and the area had suffered erosion from pedestrian traffic. This site is about 2.4 mi (3.9 km) north of the Birch River bridge replacement.

4.2 GOVERNMENT LAND OFFICE SURVEYS

The Government Land Office (GLO) plat maps for the project area do not depict many features beyond lakes, rivers, and swampland. A significant exception is the GLO plat for Town 61 Range 15, which depicts an unlabeled trail and the path of the Duluth and Iron Range Railroad running northward through the western half of the township (Stuntz 1885). This trail crosses the project APE in the southwest quadrant of Section 5. The associated GLO survey notes state that "Vermillion Road runs N S" and crosses the south section line of Section 5 at 22 chains (1452 ft [442.6 m]) east of the southwest section corner (Stuntz 1882a). This appears to be only one branch of the Vermillion Road, as another north-south trail, labeled "Vermillion Lake Road" and "Road from Lake Vermillion" is depicted on the Town 61 Range 16 and Town 60 Range 16 GLO plat maps (Stebbins and McPherson 1883; Stutnz 1882b). The trail in Town 61 Range 15 is parallel to, but does not entirely coincide with, State Highway 135. The trail is not depicted on the plat map to the south, Town 60 Range 15, although the railroad line is shown there (Stebbins et al. 1883).

The railroad depicted on the GLO plat map does not follow quite the final alignment of the Duluth and Iron Range Railroad in this area, according to the 1914 and 1916 plat maps and modern topographic maps and aerial photography (W. W. Hixson and Company 1914, 1916). This likely represents a preliminary route, as the GLO survey here was conducted in 1882 and, as discussed in Section 3.0, the railroad was completed to Vermillion in 1884 (King 1972:17-26; Lamppa 2004:62-64; Stuntz 1882a, 1885). The actual route of the Duluth and Iron Range Railroad crosses the project APE east of State Highway 135 in the northeast quadrant of Section 8.

No other cultural features are depicted on the GLO plat maps for the area of the project APE in St. Louis County (Stebbins and Stutz 1884; Stuntz 1880, 1881, 1882b, 1885; Weiland and Stuntz 1884). The trail segments frequently cross what is depicted as swampland on these maps and multiple streams. The bridge crossing over the Birch River is in what was mapped as a wide area of swamp on either side of the river (Weiland and Stuntz 1884).

The location of the bridge crossing in Lake County is depicted as a swamp surrounding the river on the 1882 GLO plat map for this township. The map depicts an occupied cabin (H. A. Owens) just over 4 mi (6.4 km) to the northeast, but no other cultural features (McPherson 1882). The GLO plats for adjacent townships depict an additional homestead about 4 mi (6.4 km) to the northwest and multiple homesteads and trails within 10 mi (16 km) to the southwest (Keegan 1892; Mulligan 1903).

4.3 HISTORIC PLAT MAPS

Subsequent plat maps from ca. 1914 and 1916 were reviewed (W.W. Hixson 1914, 1916). These maps show land ownership as well as features such as roads and railroads. The trail segments in St. Louis County traverse numerous parcels owned by different individuals and entities. Parts of the eastern end of the south trail branch and the southern end of the east trail branch are on what was state land at this time. The bridge crossing over the Birch River and most of the small segment to the northeast were also on state land. Privately-owned parcels intersecting the project APE were typically no larger than 160 acres in size and usually labeled with an individual's name. Groups and businesses listed owning land within the project APE include the Duluth and Iron Range Railroad, the Minnesota Iron Company, the Vermillion Land Company, and Iron Range Land Co. H. A. Day et al. owned a significant portion of the southern trail branch.

The bridge crossing in Lake County was on land owned by the Duluth and Iron Range Railroad in 1916. The majority of the land southwest of the Manitou River in the vicinity of the bridge was Duluth and Iron Range Railroad property, cut-over swamp land, or cut-over school land.

Northeast of the river, smaller parcels were owned by R. A. Alger et al., Alger Smith & Co., and others (W. W. Hixson 1916).

4.4 HISTORIC AERIAL PHOTOGRAPHS

Aerial photographs of the project area taken in 1940 were examined for cultural features (Agricultural Stabilization and Conservation Service [ASCS] 1940a, 1940b, 1940c, 1940d, 1940e, 1940f, 1940g, 1940h, 1940i, 1940j, 1940k). Roads, rail grades, buildings, fields, clearings, and other disturbances are visible, although not in arrangements significantly different than at present. Other than the crossings at State Highway 135 and Murray Forest Road, a coincident segment along the former Duluth, Missabe, and Iron Range Railway grade, and a few faint trails (e.g., on the west side of Falls Lakes, north of Fishing Lakes, between Putnam Lake and Skeleton Lake, and north of the East Two River) the project APE does not intersect cultural features visible on the 1940 aerial photographs. Fewer trails are visible than in modern aerial imagery. In general, the project area appears to be forest and wetland. The forest appears less recently logged than at present. One exception is where the south and west trail branches intersect just west of Kugler Road (ASCS 1940b). This area had been recently logged again at the time of the July 2016 survey. Bridges at or near the crossing locations over Owens Creek and at Falls Lakes may have existed Owens at this time, but the other bridge crossing locations in St. Louis County do not appear to have had extant bridges. Aerial imagery was not available for the bridge crossing location in Lake County.

4.5 LIDAR

LiDAR data produced through the National Digital Elevation Program and obtained from the USDA NRCS Geospatial Data Gateway (https://gdg.sc.egov.usda.gov/) was examined in order to identify potential cultural features coincident with the project APE. Using hillshade derivatives of 1 m LiDAR data, Commonwealth personnel manually checked the project APE and areas within 100 ft (30.5 m) of the proposed trail alignment centerline for patterns, such as flat areas, square, round and linear shapes, and features that looked different than the surrounding landscape. Specifically, abrupt changes in elevation, unusual shapes, and clusters of features were sought. These potential anomalies were then checked against topographic maps and aerial imagery to eliminate features such as water and modern buildings and to better identify roads and trails. Spatial information on anomalies that could not be explained as natural features or modern development, along with the trails identified through the LiDAR data, was carried into the field with the survey crew so anomalies coincident with the project APE could be ground-checked.

LiDAR anomalies were identified all along the three main branches of the surveyed trail alignments, but not along the smaller segment to the northeast or near either of the isolated

bridge crossings in St. Louis and Lake counties. Clusters of anomalies occurred at the northern terminus of the west trail branch, along the spur to North Hayland Road, and along the south trail branch west of Falls Lakes.

5.0 METHODS

Survey of the Prospector Loop ATV trail segments was conducted in accordance with the *Survey Manual for Archaeological Projects in Minnesota* (Anfinson 2005) and the *Secretary of Interior's Standards and Guidelines for Archaeology and Historic Preservation* (National Park Service 1983).

5.1 PRE-FIELD

Prior to fieldwork, Commonwealth personnel conducted pre-field research including a literature search and an investigation of the historic and environmental context of the project area. As discussed in Section 4.0, historic maps and aerial photography, previously recorded site files, and LiDAR data were consulted to determine the potential for archaeological sites within the project APE.

5.2 FIELD METHODS

Field Survey consisted of shovel testing, surface reconnaissance, and visual inspection of areas that were disturbed, wet, or excessively sloped. The project APE was identified in the field through use of project plans and design files that had been downloaded into global positioning system (GPS) units (Trimble Geo-XT) to assist the field crews in accurately delineating the trail corridor. Notes regarding dates of the survey, surface visibility, presence of utilities and other ground disturbance, survey coverage, and results of the survey were recorded on the project plans and in daily field logs.

5.2.1 Surface Reconnaissance

Archaeological surface reconnaissance is employed in situations where surface visibility is good, such as in a plowed agricultural field. Even when surface visibility is poor, some surface features, such as pits, foundations, refuse scatters, or other human modifications to the landscape, will be apparent. Surface reconnaissance was employed throughout the project area to check for such features, as well as to examine exposed surfaces (e.g., unimproved road/trail surfaces, tree falls) for artifacts.

5.2.2 Shovel Testing Methodology

Shovel testing was employed in portions of the project APE where ground visibility was too poor for surface reconnaissance to be conducted. Shovel tests were not excavated in hydric soil contexts, in standing water, in obviously disturbed areas, or on steep slopes exceeding approximately 15 degrees. Shovel testing was employed in areas that were considered to have a

higher probability for harboring archaeological sites based on geographic location and information gleaned during pre-field research. Shovel tests were excavated at intervals of 49.2 ft (15 m). Each shovel test measured at least 13.8 inches (in) (35 centimeters [cm]) in diameter and extended at least 3.9 in (10 cm) into subsoil devoid of any cultural materials. The excavated matrix was screened through ¼-inch mesh hardware screen. All shovel tests were numbered and observations recorded in field notes and on project forms. Observations included the depth, texture, and Munsell color of the exposed soils or sediments. Profiles of positive shovel tests in the site area were recorded on standard forms. Once documentation was completed, each shovel test was immediately backfilled.

6.0 RESULTS

Commonwealth's crews conducted Phase I archaeological survey for the proposed Prospector Loop ATV trail in St. Louis and Lake counties, Minnesota, in July of 2016. The project APE encompasses a total of 28.93 mi (46.56 km) of proposed trail alignments in St. Louis County and two additional bridge replacements in St. Louis and Lake counties. With a 25 ft (7.6 m) buffer on either side of the trail centerline, the APE encompasses 175.33 acres (70.96 hectares). Of the 28.93 mi (46.56 km) of surveyed trail alignment, 24% (6.90 mi [11.10 km]) was shovel tested, 12% (3.43 mi [5.52 km]) was subject to surface reconnaissance, 17% (7.69 mi [12.38 km]) was previously disturbed, 10% (2.88 mi [4.63 km]) was wetland, and 28% (8.03 mi [12.92 km]) was excessively sloped.

The July 2016 archaeological survey did not result in the identification of any archaeological sites. No previously identified archaeological sites have been recorded within or adjacent to the project APE. Modern refuse was occasionally encountered along the proposed trail alignment, both when the APE coincided with an existing trail and when it did not. The only other cultural material encountered was an overgrown pile of bricks and concrete encountered along the south side of the western trail branch, east of State Highway 135 and the former Duluth, Missabe and Iron Range Railway grade (now the Iron Ore Trail) and southwest of a utility corridor (Figure 6.0-1). No foundations or other structural remains were identified in the vicinity of the brick pile and no other artifacts were identified. No structures or clearings are visible here on a 1940 aerial photo and the gravel road did not exist at that time (ASCS 1940d). The pile is located on the extreme eastern edge of the northeast quarter of Section 8, Town 61 North, Range 15 West, and no features are depicted here on the GLO plat map or the 1914 and 1916 plat maps, although the latter do not depict individual structures (Stuntz 1885; W.W. Hixson and Co. 1914, 1916). This is not far from the intersection of Highway 135 with Sherman and Rivers roads, and the location labeled "Rivers" on historic plat maps and modern topographic maps which may represent a former stop on the rail line. The pile may represent a structure at this location that was destroyed when the gravel road was created, or it may represent rubble from building demolished elsewhere—such as near the railroad—and carried in and dumped where it would be out of the way.

6.1 TERRAIN

The project APE covered terrain that was alternatively rugged and low and wet. Particularly rugged areas were encountered on the western and southern trail branches. The project is in a glaciated area (see Section 2.0) and the ice sheet deposited till in the form of ground and end moraines atop bedrock in this area. This resulted in undulating and sometimes hummocky ground. Glacial deposits also created some very rocky areas along the project APE, namely on the southern and western trail branches. Often, the surface consisted of unsorted glacial till with

Figure 6.0-1. Pile of Bricks and Concrete Fragments Adjacent to West Trail Branch in Wetland Area East of State Highway 135, View South

Figure 6.1-1. Down-Cut Trail in Rocky Area, Northwest of Fishing Lakes, View West

a large percentage of cobbles and gravel (Figure 6.1-1). Shovel testing in these areas was difficult and generally could not penetrate deeply, although deep burial of cultural materials in this rocky matrix is unlikely. Frequently, vegetation and the thin topsoil had been worn away along the existing trails, exposing the rocky till (Figure 6.1-1). In some places, the ground surface was covered by boulders and shovel testing was not possible (Figure 6.1-2).

The most extensive wetland areas traversed by the project APE were encountered along the east trail branch (Figure 6.1-3). The west branch frequently skirted and occasionally crossed wetlands. On the southern branch, wetlands of any extent were only encountered northeast of Fishing Lakes and along the shore of Falls Lakes (Figure 6.1-4).

6.2 SURFACE RECONNAISSANCE

Much of the project APE follows existing trails. These trails varied in width and condition. According to maps and signage, some are intended as non-motorized trails (i.e. cross-country skiing, hiking, and horseback riding) and some as snowmobile trails (Minnesota DNR n.d.). Some were likely created as logging roads, as they extend into areas that appear to have been logged in recent decades. Among these are roads that appear to have been newly improved for more recent logging. In some cases, these existing trails represent disturbed areas that were built-up or cut-down, as discussed below, while in others the trails were located on the natural ground surface. These natural-surface trails varied from a vegetation-covered path with no surface visibility, to a well-worn trail with a high percentage of ground visibility. Shovel testing was undertaken, where possible, along trails with low surface visibility (see below), while trails with high surface visibility were subject to surface reconnaissance (Figure 6.2-1).

6.3 SHOVEL TESTING

The majority of shovel testing occurred along the eastern and southern branches of the project APE The most extensive areas of shovel testing were those paralleling improved gravel roads north of Moose Lake, east of Kugler Road, and off of North Hayland Road, a segment in the vicinity of Falls Lakes, and a segment just south of the former Duluth, Missabe, and Iron Range Railway grade at the northern end of the east trail branch.

In the area north of Moose Lake, the proposed trail alignment partially coincides with a ridge running through the rugged, forested terrain. Shovel testing was conducted along the crest of this ridge where the trail alignment fell on or close to it. The remainder of this area was shovel tested along the proposed alignment, unless the ground was steeply sloped or wet. Most trees, particularly in the eastern half of this area, were relatively young, suggesting the area had been logged within the past few decades. Much of the southern half of the spur off of North Hayland

Figure 6.1-2. Boulder-Covered Terrain along West Trail Branch, East of State Highway 135, View East

Figure 6.1-3. Trail Alignment in Wetland Area on the Eastern Trail Branch, South of Former Duluth, Missabe and Iron Range Railway Grade, View South

Figure 6.1-4. Extant Trail in Wetland Area at Edge of Falls Lakes, View East

Figure 6.2-1. Example of Surface Reconnaissance Area along Existing Trail with Exposed Ground Surface, North of Little Birch Lake, View Southwest

Road was found to be wetland with extensive areas of standing water. The remainder of this spur was shovel tested to the point where the trail alignment began to coincide with an existing trail.

At Falls Lakes, the trail was generally low and wet (Figure 6.1-4), sloping, or consisted of exposed rocky ground in the trail bed. Most shovel testing here was conducted on higher ridges adjacent to the trail, where the probability of encountering artifacts was likely higher due to the ground being dry and undisturbed (Figure 6.3-1). Some shovel testing was also conducted along the low-lying central portion of the isthmus between the two basins and on the higher riverbank adjacent to the trail on the west side of the lakes. Unlike much of the area to the east and west, older trees were observed between Falls Lakes, likely due to difficulty of access for logging. A modern fire ring of cobbles surrounding burned wood and a beverage can was noted on the west side of the existing bridge over the stream between the lakes. ATV tire marks were observed on the bridge itself.

A specifically targeted area of shovel testing was along the west trail branch in the vicinity of where, according to the GLO plat map, the old Vermillion Road may have intersected the project APE west of State Highway 135 (Figure 6.3-2). Additional segments of shovel testing and single exploratory shovel tests were excavated where possible along the remainder of the project APE (Figures 6.3-3. and 6.3-4). Some of these segments were up to 1200 ft (366 m) long and most were located along the east trail branch.

6.4 DISTURBED AREAS

Disturbed areas included built-up former rail grades, recently logged areas, existing trails that had been built up over a wetland or cut into a slope, and other forms of ground disturbance. The northern end of the east trail branch follows the former Duluth, Missabe, and Iron Range Railway for about 1.73 mi (2.78 km) northeast from the intersection of the rail grade and Murray Forrest Road south of Highway 1. The grade is a built-up gravel berm and the rails and ties have been removed (Figure 6.4-1). Elsewhere, the project APE follows existing trails that were built-up above wetland areas. Examples include the west trail branch near the northern bridge crossing location, and the southern branch north of Fishing Lakes. Existing trails were also found to be cut down below the ground surface in numerous places. This likely occurred to create a grade that could be driven by logging trucks and other vehicles, especially on slopes (see Figure 6.1-1).

Relatively recent logging has disturbed numerous areas in the vicinity of the project APE. Logging was taking place nearby during survey, although not along the proposed trail alignment. Examples of recently logged areas along the project APE include, but are not limited to, an area on the eastern trail branch near Skeleton Lake (Figure 6.4-2), on the southern branch north of Hayland Road, and at the southern end of the western branch, just west of Kugler Road. Logging disturbance varied and in some places the only observable sign was the lack of older trees. In

Figure 6.3-1. Shovel testing on the Ridge North of the Extant Trail, East of Falls Lakes Bridge, View North

Figure 6.3-2. Proposed Trail Alignment and Extant Ski Trail in Vicinity of Old Vermillion Road, as Plotted During 1882 GLO Survey, West of State Highway 135, View South

Figure 6.3-3. Shovel Testing on Southern Trail Branch, Northeast of Mud Lake, View East

Figure 6.3-4. Shovel Tested Area on East Trail Branch near Southern Bridge Crossing Location over Unnamed Creek, View Northwest

Figure 6.4-1. Former Duluth, Missabe and Iron Range Railway Grade at North End of East Trail Branch, View West

Figure 6.4-2. Extant Dirt Road in Area Disturbed by Logging, Northwest of Skeleton Lake, View Southeast

other areas, logging had occurred recently, as evidenced by a lack of trees, ground disturbances, stumps, piles of logs and brush, and improved logging roads. On the western tail branch, logged areas covered with dense mats of downed branches and logs were encountered.

6.5 LIDAR ANOMALIES

Prior to field survey, Commonwealth examined LiDAR imagery of the project area to identify anomalies with the potential to be cultural in origin. The location of these anomalies was downloaded onto the GPS units carried into the field. No LiDAR anomalies examined within or near the project APE proved to be definitively cultural in origin.

Depressions that were likely due to logging disturbance were observed in some locations. One relatively large pit located in a small clearing along the north side of the southern trail branch was considered notable for its size (Figure 6.5-1). This pit was about 33 ft (10 m) in diameter and 6.5 ft (2 m) deep with sloping sides and one large boulder in the western half. No artifacts or other features were encountered around it. The project APE follows an existing trail here, which skirts around the southeast side of the pit. The landscape in this area is on an end moraine and is naturally very pitted and hummocky, as depicted on topographic maps (Figure 1.1-1b) and observed in the field. This pit may be natural in origin. Forest is the only observable feature at this location on the 1940 aerial photograph (ASCS 1940g). The pit was on property owner by L. W. Stevens in 1914 and by H. A. Day et al. in 1916 (W. W. Hixson and Co. 1914, 1916). No structures or other features are marked here on these maps.

Other anomalies turned out to be natural features such as bedrock outcrops (Figure 6.5-2), accumulations of boulders, and tree falls. At some anomaly locations, no surface features that might have caused the anomaly could be identified. The cluster of relatively anomalies at the northern terminus of the west trail segment appear to be associated with a disturbed, artificially flattened area between State Highway 135 and a utility corridor. This area may have been used as a staging area for the recent re-routing of the highway or other construction in the vicinity.

6.6 BRIDGE CROSSINGS

Bridge crossing locations included locations with extant bridges or culverts in various states of repair, and locations with no extant bridge in the project APE. The only one of the eight bridge crossing locations on the surveyed trail alignment with an extant bridge was located along the southern segment at Falls Lake. Here, Bear Creek cuts through the narrow isthmus between the two lake basins. The extant bridge over the creek consists of five heavy wooden planks that are starting to separate from one another. Shovel tests were excavated along the isthmus to either side of the bridge (Figure 6.6-1). As noted above, signs of recent use in the form of ATV tracks and a fire ring were observed at this location.

Figure 6.5-1. Example of LiDAR Anomaly, Large Pit Adjacent to South Trail Branch, North of Little Birch Lake, View Northeast

Figure 6.5-2. Example of LiDAR Anomaly, Bedrock Outcrop Near West Trail Branch, North of West Two River, View West

Figure 6.6-1. Shovel Testing Near Extant Bridge at Falls Lakes, View West

Figure 6.6-2. East Two River at Proposed Bridge Crossing Location on East Trail Branch, View Southeast

On the east trail branch, the trail crosses three waterways: the East Two River in the north, Owens Creek in the middle, and an unnamed creek in the south. There is no extant bridge over the East Two River on the proposed trail alignment (Figure 6.6-2), although a crossing does exist on a gravel road about 280 ft (85 m) to the northeast. Shovel testing was conducted on either side of the river in the project APE, although not directly on the riverbank as the ground slopes down towards the water on either side. At Owens Creek, the proposed trail alignment follows an existing logging road off of Matias Road and is coincident with Bear Island Lake Trail. This road crosses the creek at a ford and water was flowing over the road at the time of survey. Shovel tests were dug on dry ground on either side of the road at either side of the creek. Soils here were found to be disturbed, with the rocky subsoil exposed on the surface. According to recent aerial imagery, this crossing was in poor repair as recently as 2011 and the road has been built up at Owens Creek since then. At the third bridge crossing on the east branch, an unnamed creek flows through a low wetland area about 245 ft (75 m) wide. Shovel testing was conducted on high ground on either side of this wetland.

On the west trail branch, specific creek crossings were not encountered at the two marked bridge crossings. Instead, the northern crossing, north of where Sherman Road crosses the project APE, is in on the edge of a wetland area. Along the proposed trail alignment at this location, wetland alternated with artificial berms associated with an extant logging road. Shovel tests were not excavated here due to wet ground and disturbances. At the southern bridge crossing, south of West Two River, the terrain was very rocky and heavily undulating. In places, the ground surface appeared to have no soil present, only rocks (similar to Figure 6.1-1). The project APE also crosses the West Two River where it is coincident with Kugler Road and there is an extant bridge on Kugler Road.

The small trail segment to the northeast, near Purvis Lake, terminates at a planned bridge crossing over the Beaver River. There is currently no bridge at this location and the Beaver River is relatively broad compared to some of the streams encountered during survey at the other bridge locations. The river flows through a wetland area that extended about 655 ft (200 m) north along the project APE. The Taconite Spur snowmobile trail crosses the river in the wetland about 885 ft (255 m) to the east. A shovel test was excavated in the wetland along the proposed trail alignment about 135 ft (41 m) north of the river and hydric soils were encountered.

The bridge crossing over the Birch River near Babbitt was surveyed through visual inspection (Figure 6.6-3). The location was found to be too wet to shovel test, with extensive standing water observed in the existing snowmobile trail at this location, and open wetland vegetation extending for at least 50 ft (15 m) on either side of the river at the crossing. Each end of the extant bridge appears to be supported by an artificial berm and this constitutes the only dry ground near the bridge. The bridge itself consists of wooden planks atop a series of beams spanning the creek and currently is easily passable on foot.

Figure 6.6-3. Extant bridge over Birch River in Wetland, View North

Figure 6.6-4. Extant bridge on General Grade Road Over Manitou River in Lake County, View Northeast

The bridge crossing over the Manitou River in Lake County was surveyed through shovel testing and visual inspection (Figure 6.6-4). This bridge consists of a culvert under the existing gravel road (General Grade Road). Four shovel tests were excavated around the bridge, one on each side of the road on either end of the bridge. East of the river, the ground appeared to be artificially built-up. The shovel tests on this side were excavated to 32 in (80 cm) below the surface. On the west side, the ground was low and wet. The shovel tests here revealed hydric soils.

7.0 SUMMARY AND RECOMMENDATIONS

Lake County is proposing to construct 240 miles (mi) (386 kilometers [km]) of all-terrain vehicle (ATV) trails for the Prospector Loop ATV Trail project in northeastern Minnesota. This project is funded by the Federal Highway Administration (FHWA) through its Federal Recreational Trail Program (FRTP). MnDOT is reviewing the project in compliance with Section 106 of the NHPA of 1966, as amended (Public Law 89-665), and its implementing regulations (36 CFR 800). Section 106 requires agencies to account for the effects a project may have on cultural resources listed in or eligible for listing in the NRHP. MnDOT contracted Commonwealth to conduct a Phase I archaeological survey within the project APE for 25 mi (40 km) of the proposed trail alignment in St. Louis County, Minnesota, and for bridge installations or replacements in St. Louis and Lake counties, Minnesota.

A Phase I reconnaissance survey of 28.93 mi (46.56 km) of trail alignments and nine bridge locations was conducted by Commonwealth archaeological field crews between July 11 and 22, 2016. Prior to fieldwork, Commonwealth personnel conducted pre-field research including a literature search and an investigation of the historic and environmental context of the project area. Historic maps and aerial photography, previously recorded site files, and LiDAR data were consulted to determine the potential for archaeological sites within the project APE. Field survey included shovel testing, surface reconnaissance, and visual inspection of areas that were disturbed, steeply sloped, or in standing water. These investigations did not result in the identification of any archaeological sites. No previously identified archaeological sites have been recorded within or adjacent to the project APE.

Based on these results, it is Commonwealth's opinion that the portion of the proposed Prospector Loop ATV Trail project surveyed in July of 2016 will have no effect on archaeological sites and no further action is recommended. Finally, should there be any changes to the proposed project's APE, such changes will require further review in accordance with NHPA direction.

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