

APPENDIX D.

**ARCHAEOLOGICAL INVESTIGATION CONDUCTED FOR THE
PLYMOUTH CREEK STREAM CHANNEL RESTORATION FEASIBILITY STUDY,
CITY OF PLYMOUTH,
HENNEPIN COUNTY, MINNESOTA**

Prepared for:

Bassett Creek Watershed Management Commission

and

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MANAGEMENT SUMMARY

During the fall of 2015, Archaeological Research Services (ARS) conducted an archaeological Phase I survey along a segment of Plymouth Creek in the City of Plymouth, Hennepin County, Minnesota. The investigation is part of a feasibility study that is being completed by Barr Engineering (Barr) for the Bassett Creek Watershed Management Commission (BCWMC) Watershed Management Plan.

The study examines the feasibility of restoring damaged areas along the channel of Plymouth Creek within the Plymouth Creek Park and between Fernbrook Lane North and Annapolis Lane North. It aims to identify sites that need some form of stabilization to address damage caused by erosion, scouring and other reasons for bank failure.

The feasibility study follows the protocols developed by the U.S. Army Corps of Engineers (USACE) and the BCWMC for projects within the BCWMC Resource Management Plan (RMP). As the implementation of these efforts would involve public land and funding as well as federal permitting of wetland impacts, the project proposers anticipate that the State Historic Preservation Office (SHPO) and the Office of the State Archaeologist (OSA) both will request an archaeological review of the project route. Consequently, a records and literature search and preliminary field assessment were incorporated into the feasibility study.

Retained to conduct the review, ARS completed a field inspection during late October, mid November and early December 2015 following records and literature searches at SHPO and OSA. Methodology and results are described below in Sections 2.0 and 3.0 and the conclusions provided in Section 4.0.

The study area measures approximately 2800 feet as it extends from from Annapolis Lane on the downstream end to a control structure in Plymouth Creek Playfields Park on the upstream end. Fernbrook Lane crosses the creek roughly half way through the study reach. The site is located just northwest of the intersection of I-494 and Hwy 55 in Plymouth, in SWSW 1/4 Section 15, SESE 1/4 Section 16, NENE 1/4 Section 21 and NWNW 1/4 Section 22, T118N, R22W.

Visual inspection of existing erosion exposure, in some areas supplemented by shovel testing, provided enough survey coverage to conclude that neither the banks of the creek nor the areas close enough to be affected by proposed stabilization measures feature any archaeological evidence. However, should final design of needed stabilization measures change the now proposed areas of project impact, this initial inspection will need to be supplemented with further survey conducted in a manner that meets previously referenced federal and state guidelines.

1.0 INTRODUCTION AND PROJECT DESCRIPTION

During the fall of 2015, Archaeological Research Services (ARS) conducted an archaeological Phase I survey along a segment of Plymouth Creek in the City of Plymouth, Hennepin County, Minnesota. The investigation is part of a feasibility study that is being completed by Barr Engineering (Barr) for the Bassett Creek Watershed Management Commission (BCWMC) Watershed Management Plan.

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The study reach of the creek measures approximately 2800 feet as it extends from from Annapolis Lane on the downstream end to a control structure in Plymouth Creek Playfields Park on the upstream end. Fernbrook Lane crosses the creek roughly half way.

The project is divided into three sub-reaches as shown below in Figure D:1. Land use immediately adjacent to Reaches 1 and 2 is predominantly a disc golf course. Reach 1 has heavy tree cover and sparse vegetation below the canopy, in part due to traffic from the disc golf course. Reach 2 is a mix of tree cover and a grassy riparian area. The land use adjacent to Reach 3 is primarily a wooded valley on both sides of the creek, which is located adjacent to a residential neighborhood.

Barr staff walked the entire study reach in September 2015 and identified sites that require stabilization to address bank erosion, scour, and/or bank failure. Additional site visits were conducted through October and November to meet with stakeholders on site, check conceptual stabilization alternatives, and observe the creek during different flow conditions. Resulting recommendations are shown below.

Stabilization techniques used to prevent additional bank erosion and improve in-stream and riparian habitat may include riprap, j-vanes, cross vanes, biolog, live stakes, vegetated reinforced soil stabilization (VRSS), live fascines, selective tree removal, re-establishment of riparian vegetation, and planting native trees and shrubs.



Figure D:1 Plymouth Creek Study Area

2.0 ENVIRONMENTAL AND HISTORIC SETTING

The survey area is located within the Emmons-Faribault Moraine -- a geomorphic region dominated by glacial features left by the advancing and receding of the Des Moines Lobe during the Late Wisconsin glaciation approximately 18,000 to 13,000 B.P.: irregular loam mantled moraines and numerous ice disintegration features which have created deep, often isolated, now water- or peat-filled depressions (UMAES 1973:18).

At the time of the original land survey, i.e. prior to more extensive impact by Euroamerican settlement, the survey area supported primarily oak openings and barrens, with small pockets of either deciduous hardwoods ("big woods") or open prairie (Marschner 1974). A few miles to the northeast/east/southeast, the Mississippi River valley supported river bottom forest (primarily elm, ash, cottonwood, boxelder, basswood, maple, willow and hackberry) alternating with wet prairie, marshes and slough grasslands.

Easy access to a range of habitats would have provided early inhabitants of the area with a rich variety of plant and animal resources. At the time of Euroamerican settlement, the forest areas supported species such as white-tailed deer, cottontail rabbit, woodchuck, raccoon and bear.

The prairie and prairie/woodland border would have sustained large mammals such as bison and elk, as well as numerous small species. The rivers, lakes, sloughs, and marshes contained muskrat and beaver, numerous types of waterfowl, and many species of fish and turtle (Anfinson 1990).

Reaching farther back in time, pollen cores and macrobotanic evidence attest to quite dramatic changes in the regional environment throughout the postglacial period. A periglacial parkland of spruce and larch followed the retreat of the Wisconsin glaciers and the tundra vegetation associated with their margins. By 11,500 B.P., rapid climatic change had caused the spruce to be succeeded by pine forest (by approximately 10,000 B.P.) and then by a deciduous forest composed primarily of oak and elm. A warming and drying trend, which characterized the early to middle Holocene, peaked at 7,000 to 6,000 B.P., causing the prairie and its transitional prairie-woodland margin to expand some 75 miles north and east of their normal limits. Linked with these climatic warming trends were an increase in the frequency of prairie fires and a marked decline of the water table which caused many small lakes to dry up completely (Wright 1972, 1974; Anfinson and Wright 1990).

Pollen cores from Hennepin County have provided quite specific environmental data for the more immediate study area, charting changes from the middle Holocene to the present (Grimm 1983). They suggest that woodlands prevailed throughout the Holocene in the northeastern Big Woods area which includes much of what is now Hennepin County. This is perhaps best explained by local infrequency of fire due to a rolling topography with numerous deep lakes which would have retained water even during the middle Holocene. Just as significant was probably the protection provided by major firebreaks such as the main rivers and large bodies of water like Lake Minnetonka. Local vegetation consisted of a fairly balanced mixture of woodland and prairie from 6,330 to 3,810 B.P., followed by oak-dominated woodlands from 3,810 to 280 B.P. The onset of cooler and wetter climatic conditions encouraged the development of the Big Woods (dominated by elm, maple and basswood) from 280 B.P. to the mid-1800s and the beginning of Euroamerican clearing and settlement (ibid. 1983).

Until the late 1800s, the area around Plymouth and upper Bassett Creeks remained quite rural: all woodlands and farmed fields with a smattering of farms and the western edge of Minneapolis still well to the east (Andreas 1874). As the city expanded west and north, a segment of Bassett Creek was protected as part of Theodore Wirth Park and the historic Grand Rounds Scenic Byway system (Harrison 2002). Beyond that, urban and suburban growth has changed most of the area and although other segments of the creek since have been protected as designated parkland, long stretches of the stream have been confined to channels which have been narrowed and straightened to accommodate residential and industrial development. Old photographs and topographic maps, along with less urbanized segments of the drainage, indicate that the historic appearance was that of a naturally meandering stream which at times was flanked by quite pronounced glacial knolls but elsewhere traversed quite wide and often marshy stretches of floodplain.

As the Twin Cities metropolitan area was one of the first to be cleared for farming or developed for residential and commercial use, much archaeological evidence can be presumed to have been destroyed before it could be recorded and studied but some of it has survived in parks and otherwise protected areas around the metropolitan lakes and rivers especially in the lake country of the southwestern metro region and also on the uplands along the Mississippi River valley and its confluence with the Minnesota River -- all of which, along with the current project area, are part of the so-called "Central Deciduous Lakes South" archaeological region (Anfinson 1990).

Easy access to a wide range of habitats would have provided a rich variety of plant and animal resources throughout this region. In the the forested areas were species such as white-tailed deer, cottontail rabbit, woodchuck, raccoon and bear, and on the prairie -- or along the prairie/ woodland border -- larger game such as bison and elk as well as numerous smaller species. The rivers, lakes, sloughs, and marshes harbored muskrat and beaver, numerous types of waterfowl, clams and many species of fish and turtle (Anfinson 1990).

Archaeological evidence indicates that this rich environment attracted Native Americans to the area throughout the postglacial period. While no archaeological sites have been recorded in close proximity to the survey segment of Plymouth Creek, such evidence is known to exist elsewhere in the Plymouth-Bassett Creek watershed. In May of 2011, ARS completed a cultural resource Phase IA review for the Bassett Creek Watershed Management Commission Resource Management Plan. The results were intended to provide a preliminary understanding of the archaeological and historic potential of six Plymouth and Bassett Creek segments that were considered to warrant channel restoration, sediment removal and/or other water quality improvement measures. OSA site files were reviewed by ARS for information about archaeological sites identified within a mile of these project areas. Information from the history/ architecture data base that is maintained by SHPO was provided by that office directly to Barr. Both sets of data are presented in the 2011 report. In addition, ARS reviewed SHPO report files for cultural resource surveys previously conducted within and near the project area. ARS staff also examined historical maps and aerial photographs at the Minnesota Historical Society and the University of Minnesota-Borchert Map Library.

Although the results of the records search indicated that a number of archaeological surveys had been conducted within the watershed, many of them had proven negative. Archaeological sites had primarily been identified on larger bodies of water that drain into Bassett Creek: on the shores of Medicine Lake and, a few miles downstream, the Sweeney and Twin Lakes as well as Birch Pond by Wirth Lake. Most of these sites are quite distant from the current project area but a few are close enough to indicate a possible relationship to the latter:

21-HE-0068 (Medicine Lake Mounds) -- seven mounds recorded in 1887 on a hogback ridge on the west side of Medicine Lake (Winchell 1911:255). No longer visible, they may have been destroyed by house and road construction as burial authentication efforts proved negative (Mather et al. 1997). Located in T118N, R22W, Section 26 (SW-NE and W-SW-NE).

21-HE-0261 -- a corner-notched point reported as found on a cultivated terrace that overlooks the marshy Plymouth Creek floodplain in T118N, R22W, Section 22 (W-SW-SE-NE).

The fact that relatively few cultural resources have been recorded in the vicinity of Plymouth and Bassett Creeks more than likely reflects a lack of systematic inventory survey rather than an actual lack of archaeological and historic potential, considering that most of the areas that have been inventoried proved positive. Existing data for the few areas that have been investigated suggest that most uplands that overlook these streams and associated lakes/wetlands would have attracted Native Americans as well as early Euro-American settlers.

Drawing on our understanding of the sites that do exist here as well as in neighboring parts of the "Central Deciduous Lakes South" archaeological region, we know that the following main cultural manifestations are known or likely to be represented in the archaeological record of the general study area: the **Paleoindian and Early Archaic periods** (ca. 10,000 to 3000 B.C.); the **Middle to Late Archaic periods** (ca. 3000 to 800 B.C.); the **Woodland period** (ca. 800 B.C. to

the time of the time of early Euro-American contact); the **Oneota and Plains Village traditions**, which emerged around A.D. 950-1000; the **period of initial contact between Native Americans** (the Eastern Dakota) **and 18th/19th century Euro-Americans** (French, British and American explorers, military men, traders and missionaries); the **period of Euro-American settlement and home-steading**. As this investigation did not produce any archaeological evidence that needs to be evaluated within a larger cultural framework, more detailed discussion of the regional cultural sequence seems redundant in this report. More detailed discussions of the characteristics of each context can be found in Minnesota History in Sites and Structures: Pre-Contact and Contact Period Contexts, compiled and updated as needed by the State Historic Preservation Office (SHPO). A somewhat more comprehensive description is appended to the 2011 report.

3.0 SURVEY METHODOLOGY AND RESULTS

As the project will need a Section 404 U.S. Army Corps of Engineers permit to fill jurisdictional wetlands, it will require compliance with Section 106 of the National Historic Preservation Act of 1966 and consultation with SHPO. As an undertaking that involves non-federal public land and funding, the project will also come under the purview of OSA and Minnesota Statutes 138.31-.42. More encompassing, the Minnesota Private Cemeteries Act (MnST 307.07) protects all human remains and burials that are older than 50 years and located on private or public lands outside of platted, recorded or identified cemeteries.

In view of the above, the archaeological research done for this project has been conducted in a manner that meets the requirements of the Secretary of the Interior's Standards for Identification and Evaluation of cultural resources as well as the standards specified in the State Archaeologist's Manual for Archaeological Projects in Minnesota.

3.1 Records/Literature Search

Prior to the field review, ARS updated information they had already compiled for the Plymouth Creek study area as part of the above-mentioned 2011 Phase IA review. According to OSA staff, no new archaeological site information has been received by that office, nor do their records show that any studies have been or are being conducted in that area since 2011.

3.2 Plymouth Creek west of Fernbrook Lane

As shown in Figure D:1 and described above on page 2, the project route parallels the southern edge of a disc golf course. The medium blue line in the figure shows the existing stream centerline while the darker blue lines indicate the extent of the stream valley and the areas where its banks may be somewhat modified. The green lines show places where minor re-routing of the stream are being considered. Those concepts do not show the exact route, but rather the vicinity and rough extent of a re-route/remeander.

Although the field survey primarily focused on the areas that seemed likely to be affected by the undertaking, the entire length of this creek segment was visually reviewed including all areas adjacent to the stream banks up to a distance of 75 feet from the stream. The field review was conducted following the flow of the creek downstream.

From the bottom of the stream valley, ARS staff checked erosion exposure along the banks as well as erosion residue deposited at their base and in the creek. Following the top of the creek bank and covering all adjacent ground, the team then inspected the surface for evidence of any signs of past cultural activity as well as any existing subsoil exposure in the form of animal burrows, wind falls and erosion around tree roots. Because of good lateral visibility even in wooded areas as well as the ubiquitous presence of good erosion exposure all along the disc golf course and the creek banks, ARS could rely on visual inspection to provide sufficient survey coverage without supplementary shovel testing. Figures D:3 to D:5 illustrate the type of good ground exposure encountered all along this stretch. The last approximately 200 feet long segment west of Fernbrook Lane flows through low, quite marshy terrain without any archaeological potential. The area that then would be disturbed by the proposed culvert replacement under Ferndale Avenue has been completely disturbed by road construction and is also completely lacking in archaeological potential.

3.3 Plymouth Creek east of Fernbrook Lane

This eastern segment of the project -- Reach 3 on Figure D:1 -- is primarily a wooded valley which, along its northern side, abuts a residential neighborhood with newer homes on landscaped lots north of east-trending 35th Avenue. South of the avenue, wooded terrain slopes quite rapidly down to Plymouth Creek. South of the creek, however, there are several fairly level terraces that overlook the creek and could have invited enough historic use to have considerable archaeological potential (Figures D:8 and D:9). Considering that many of these terraces by now have been quite badly impacted by erosion, slumping and undercutting as shown in Figures D:6 and D:7, they are likely to be in need of bank stabilization, debris removal and some rerouting of the channel.

Consequently, ARS staff decided to supplement thorough visual inspection along the creek with systematic shovel testing of areas that lacked subsoil exposure. An initial series of tests was approximately one meter in from the south side of the creek and at approximate ten meter intervals. A second series was placed six-seven meters south of the creek, again at ten meter intervals but now staggered for more complete coverage with tests placed approximately between the ones to the north.

All tests measured approximately 40 centimeters in diameter. Each unit was taken down to sterile mineral soil, removing the soil contents by 10-centimeter levels and screening them through quarter-inch hardware cloth. It was then backfilled once soil profiles had been noted. Individual test records will be kept on file by ARS. GPS readings were used to record all test locations. All test profiles were very similar, with 40 to 50 centimeters of dark grayish brown sandy silt loam over a substratum of coarser, more sandy and gravelly, lighter colored grayish brown silt loam.

Like the preceding visual inspection of all areas affected by erosion, all test results proved negative.

4.0 CONCLUSION AND RECOMMENDATIONS

Visual inspection of existing erosion exposure, in some areas supplemented by shovel testing, has provided enough survey coverage to conclude that none of the bank segments that are prioritized for stabilizing feature any archaeological evidence.

However, should final design of needed stabilization measures change the now proposed areas of project impact, this initial inspection will need to be supplemented with further survey conducted in a manner that meets previously referenced federal and state guidelines.

5.0 REFERENCES

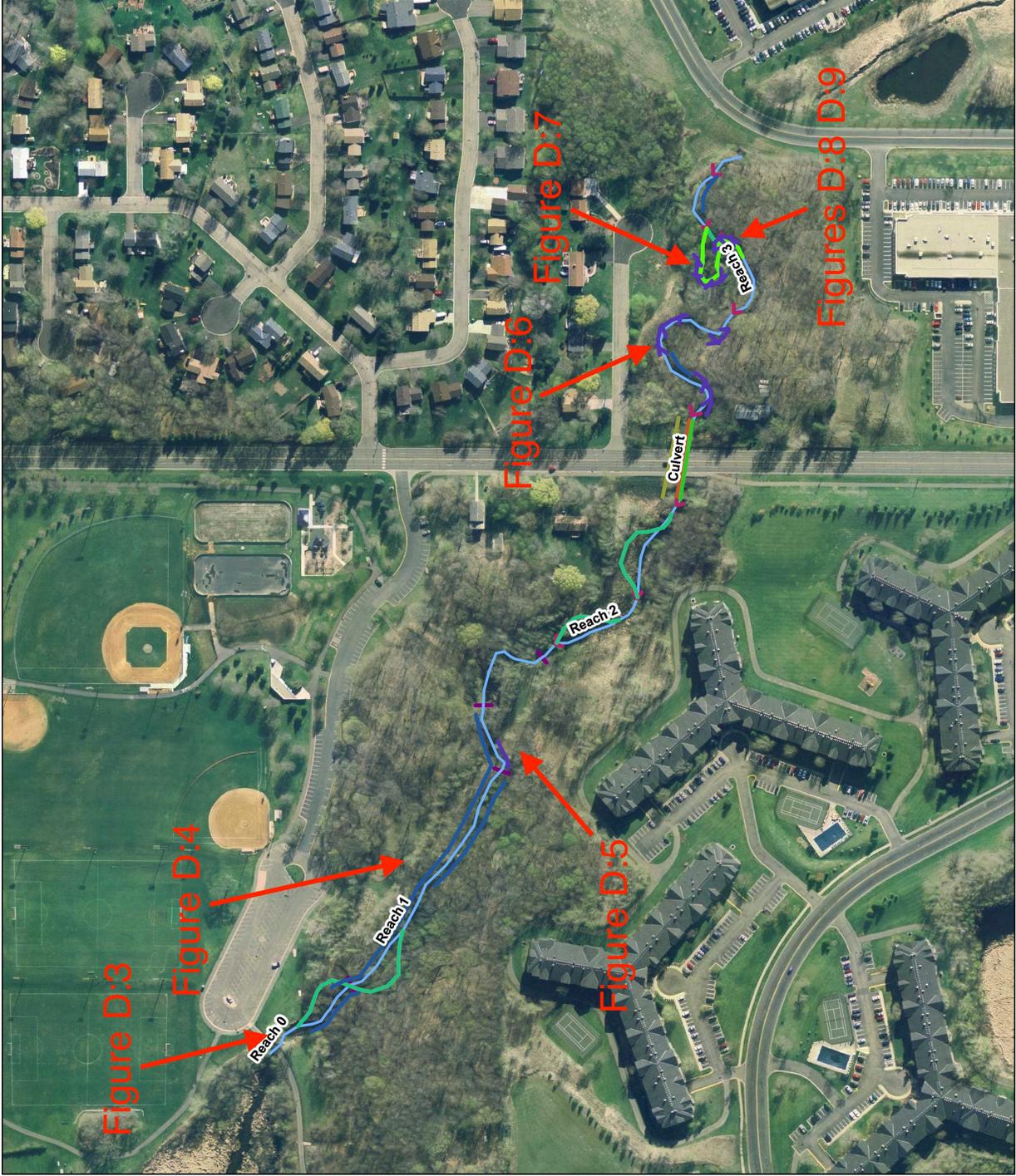
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Exhibits

Figures D-2 through D-9



Legend

| TYPE | Color |
|--------------------|--------------|
| Bank stab. | Blue |
| Culvert bed | Green |
| Culvert replace | Orange |
| Debris remov. | Light Green |
| Floodplain culvert | Yellow-Green |
| Grade control | Purple |
| Meander | Teal |
| XS change | Dark Blue |
| Concept_Reaches | Light Blue |
| Bridges | Dark Purple |



Figure D:2



PLYMOUTH CREEK STUDY REACH
 Plymouth Creek Feasibility Study
 Bassett Creek Watershed
 Management Commission



Figure D:3



Figure D:4



Figure D:5



Figure D:6



Figure D:7



Figure D:8



Figure D:9