7.0 Stream Restoration

7.1 Issue Statements

One of the primary concerns of residents in the Bassett Creek watershed is the maintenance of the natural beauty of the creek in residential and recreational areas. In many parts of the watershed, residential areas abut the creek on either side and there is concern that any channel modifications could destroy the aesthetic appeal of the area and have a corresponding effect on property values. In addition to maintaining the natural beauty of the stream corridor, there are areas of significant stream bank erosion and sedimentation along Bassett Creek that need to be addressed. The BCWMC and its member cities have identified the extent and severity of streambank erosion along most of the Bassett Creek trunk system. Only the problem areas along the North Branch of Bassett Creek are yet to be identified. The known problem areas are shown on Figure 13.

7.2 Goals and Policies

7.2.1. Stream Restoration Goals

Implement stream restoration measures whenever necessary to maintain health, safety, and welfare.

Maintain or enhance the natural beauty and wildlife habitat value of Bassett Creek.

7.2.2. Stream Restoration Policies

A. The BCWMC will establish and maintain a Creek and Streambank Trunk System Maintenance, Repair and Sediment Removal Fund through an annual assessment. This fund will be used to finance stream maintenance, repair, and restoration projects. This is a part of the BCWMC's annual water quality and flood control program (see Table 12-4).

B. The BCWMC will use the Creek and Streambank Trunk System Maintenance, Repair and Sediment Removal Fund to finance maintenance and repairs needed to restore a creek or streambank area to the designed flow rate.

C. The BCWMC will use the Creek and Streambank Trunk System Maintenance, Repair and Sediment Removal Fund to finance work needed to restore a creek or streambank area that has either resulted in damage to a structure, or where structural damage is imminent, based on an assessment of benefits.

D. The BCWMC will use the Creek and Streambank Trunk System Maintenance, Repair and Sediment Removal Fund to finance the portion of a project that provides BCWMC benefits. The property owner or city where the project is located will fund the remainder of the project. BCWMC benefits include reduced potential for flooding, mitigation of water quality impairment, or minimizing the potential for water quality impairment.

E. The BCWMC may use the Creek and Streambank Trunk System Maintenance, Repair and Sediment Removal Fund to finance the BCWMC's share of maintenance projects to be applied for by the cities that have a regional benefit, or to partially fund smaller, localized projects that cities wish to undertake.

F. The BCWMC member cities will complete and update their inventories of significant erosion and sedimentation areas along the Bassett Creek trunk system and will share this information with the BCWMC. The BCWMC will allocate funds from the Creek and Streambank Trunk System Maintenance, Repair and Sediment Removal Fund only for those areas identified in a completed inventory. Golden Valley, New Hope and Plymouth have completed inventories.

G. The BCWMC will consider the effect of stream/ditch structures on natural habitat and the needs of people/pedestrians.

H. The BCWMC will review maintenance or enhancement of navigability as part of the feasibility evaluation on all new projects.

I. The BCWMC will encourage restoration of stream and streambank areas where the natural beauty of the creek has been compromised.

J. The member cities are responsible for funding maintenance and repairs that are primarily aesthetic improvements.

K. The BCWMC will consider the effect of future flood control projects on the natural beauty and wildlife habitat values of Bassett Creek.

L. The BCWMC will maintain the scenic and aesthetic qualities of stream channels consistent with public needs and public use.

M. The BCWMC Technical Advisory Committee will develop guidelines for the allocation of funds from the Creek and Streambank Trunk System Maintenance, Repair and Sediment Removal Fund.

N. The BCWMC will review local watershed management plans for compliance with this Plan's goals and policies regarding stream restoration.

7.3 Background

Figure 13 shows the known stream erosion and sediment deposition sites along the Bassett Creek trunk system and the tributary on the north end of Medicine Lake. These sites were either identified by the cities or were known to BCWMC. The BCWMC developed a stream erosion site inventory form for the cities to use in the field. The cities of Golden Valley, New Hope and Plymouth have identified the extent and severity of streambank erosion along the Bassett Creek trunk system within their cities. Only the problem areas within Crystal and Minneapolis are yet to be identified. It is important that the location, description, severity, and extent of the eroding streambanks be documented. The erosion sites should then be prioritized for remediation, based upon the severity and extent of erosion, stability of the eroding site, number and types of threatened resources, preliminary cost of remediation, benefits of remediation for stream water quality, and input from the cities.

As part of the *Bassett Creek Main Stem Watershed Management Plan* (2000), BCWMC estimated the sediment and phosphorus loading to Bassett Creek from channel erosion. Three erosion scenarios were created to illustrate increased loadings resulting from minor, moderate and severe channel erosion. The scenarios differed by streambank height, extent of erosion into the channel banks, and the density of the eroded soil. The additional loading of sediment for these erosion scenarios was computed as a function of the length of stream channel impacted by erosion. The most likely condition present in Bassett Creek lies between the moderate and severe scenarios with approximately 10 percent of the stream channel suffering from erosion.

Similar scenarios were used to estimate the additional loading of phosphorus to Bassett Creek. Soil phosphorus data were obtained from the University of Minnesota's Extension Service soil test data

for Hennepin County. These data report the average plant available soil phosphorus from over 2000 soil tests.

The study results indicate that moderate channel erosion could contribute an additional 1,000,000 pounds of suspended sediments and 500 pounds of phosphorus annually to the Main Stem of Bassett Creek. This would represent a 190 percent increase in sediment loading and a phosphorus loading increase of 2 percent.

The following paragraphs describe the effects of urbanization on streams, as quoted from the *Minnesota Urban Small Sites BMP Manual* (Barr, 2001c):

> Existing stream characteristics are a reflection of conditions in the watershed. Under natural conditions and at bank-full capacity, studies have shown that streams can handle a flow approximately equal to the 1½ to 2 year frequency peak discharge within their banks (Rosgen, 1994; Leopold et al., 1964). The frequency of bank-full events increases with urbanization, and might be expected to occur 2 to 8 times per year compared to less than once per year under natural conditions, causing the stream to enlarge its channel to reach a new equilibrium with the increased flows. In addition to regular flood damage, this condition causes previously stable channels to erode and widen. Much of the eroded material becomes bed load and can smother bottom-dwelling organisms. Sediment from streambank erosion eventually settles in stream, rivers and lakes, reducing their capacity and water quality. Base flow in streams is also affected by changes in hydrology from urbanization because a large part of base flow comes from shallow infiltration. Impervious cover reduces base flow, reducing the volume of water available for base flow in streams (MPCA, 2000). The problem may be further compounded by the installation of shallow ground water drainage systems to accommodate road or building construction. Lower recharge rates for groundwater in a watershed are generally reflected in lower stream base flows. Low rates of recharge also extend low flow durations; particularly during prolonged droughts.
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> Urbanization will increase the runoff volume from each storm event, thereby increasing the erosive force of the flows in the channel and can significantly upset the sediment load equilibrium that was established over many years. While the significance of large flood events should not be underestimated, the smaller flows with an approximately nine-month to two-year return period frequency can be very erosive. Often, these smaller flows have not been given sufficient consideration. Hydrologic studies need to look at flood, peak flow and total flow

conditions, while keeping in mind that small-storm hydrology is a critical component for protection of property, water quality and habitat.