Memorandum

To: Bassett Creek Watershed Management Commission (BCWMC)
From: Barr Engineering Co. (Karen Chandler, PE; Jessica Olson, PE; Gabby Campagnola)
Subject: Item 5B: Review Costs and Cost Savings Alternatives for 50% Design Plans for Bassett Creek Main Stem Restoration Project, Regent Avenue to Golden Valley Road (CR-M 2024) – Golden Valley, MN
BCWMC August 21, 2025 Meeting Agenda
Date: August 14, 2025
Project: 23272114.00

5B Review Costs and Cost Savings Alternatives for 50% Design Plans for Bassett Creek Main Stem Restoration Project, Regent Avenue to Golden Valley Road (CR-M 2024), Golden Valley, MN

Summary:
Proposed Work: Bassett Creek Main Stem Restoration Project, Regent Avenue to Golden Valley Road (CR-M 2024), Golden Valley
Basis for Review at Commission Meeting: Review costs and cost savings alternatives for 50% design plans
Change Impervious Surface Area: N/A
Recommendations for Commission Action:

1) Select an alternative and authorize Commission Engineer to continue design and bring 90% design to a future Commission meeting
2) If selected alternative is more expensive than budgeted, consider amending the project budget and amending reimbursement agreement with City of Golden Valley.

At the July 17, 2025 Commission meeting, the Commission Engineer presented the 50% design plans for the Bassett Creek Main Stem Restoration Project, Regent Avenue to Golden Valley Road (CR-M 2024). The Commission reviewed and approved the 50% plans and directed the Commission Engineer to develop options for cost savings, work with city staff to obtain easements and continue other work related to the project (obtaining permits, etc.).

The 50% construction cost with contingency is $2,592,000, and the feasibility study construction cost with contingency was $1,568,000. Due to the estimated construction cost of the 50% design exceeding the estimated costs included in the 2023 feasibility study report by $1,023,300, the commissioners requested the following additional information:

- More details about the increased project costs
- A comparison of different cost saving alternatives, including updating the prioritization of the stream restoration areas to reflect changes in erosion since completion of the feasibility study
- Pros and cons associated with different cost saving alternatives, including a comparison of the proposed pollutant load reductions for each option
- Potential grant opportunities to help with increased project construction cost

Increased Project Costs

The most significant elements of the $1,023,000 estimated cost increase can be tied to three categories of construction work:

1. Streambank stabilization and in-channel structures
2. Landscaping and restoration
3. Increases in mobilization/demobilization costs

The following paragraphs provide details about each of these three cost areas.

1. Streambank stabilization and in-channel structures

The overall cost of streambank stabilization and in-channel structures increased approximately $473,000, from $625,000 to $1,100,000 (a 76% increase). The reasons for the increase are:

- The feasibility study used construction pricing/bids that are now over two years old, and construction and material costs have increased. Examples include:
  - Toewood → increased from $65 to $75 per running foot (a 15% increase).
  - Vegetated Reinforced Soil Slope (VRSS) → The feasibility study did not include the cost of the VRSS required for placement above the toewood. The 50% design cost estimate assumes two VRSS lifts per running foot of toewood, so the new unit cost associated with this item is $135 per running foot, with two layers of VRSS assumed above the toewood.
  - Riprap → increased from $153 per ton to $241 per ton (a 58% increase).

- The stream restoration length increased approximately 1,200 feet from that in the feasibility study, from 7,370 ft to 8,585 ft, due to increased erosion found since completion of the Fall 2022 feasibility study field work. This resulted in increased quantities including:
  - Fieldstone riprap → increased from 980 cubic yards to 1,115 cubic yards (a 14% increase)
  - Toewood with VRSS → increased from 1,470 to 1,645 linear feet (a 12% increase)

2. Landscaping and restoration

Based on communications with City staff, who indicated their desire to enhance riparian health while complying with city buffer codes, we expanded the vegetation management component of this project compared to the area included in the feasibility study. In some situations (e.g., on public land), the 50% plans show native vegetation proposed beyond the required city buffer width. These options are shown as add-on one and add-on two in Table 2 below. The overall cost of vegetation management between the feasibility study and 50% design (i.e., treating/removing invasives and enhancing/restoring vegetation) increased $261,000 (a 68% increase) from approximately $382,000 to approximately $643,000*.* Details related to the increase include:

- The feasibility study used construction pricing/bids that are now over two years old, and construction and material costs have generally increased. Examples include:
  - Furnish and plant trees → increased from $290 to $500 per tree (a 72% increase)
  - Furnish and install plugs → increased from $4.50 to $8 per plug (a 78% increase)

- The overall 2.2-acre footprint of invasives removal and 2.5-acre footprint of vegetation enhancement and restoration expanded to 5.6 acres of invasives removal (a 155% increase) and 7.1 acres of native plantings (a 27% increase). Due to the expanded footprints, quantities increased, for example:
    - Furnish and plant trees → increased from 55 to 200 (a 264% increase)
    - Furnish and install plugs → increased from 3,680 to 16,940 (a 360% increase)

3. Increases in mobilization/demobilization

Because mobilization and demobilization are estimated based on a percentage of the overall project cost, these estimated costs will fluctuate as the rest of the project costs change. The feasibility study's estimated cost of mobilization and demobilization increased by $86,300, from $109,700 to $196,000 (a 79% increase). Additionally, the 50% cost estimate is more detailed than the feasibility study estimate and included new line items that would have been lumped into the general mobilization costs in the feasibility study estimate. New line items for the cost of construction entrances, traffic control, and erosion and sediment control represent additional estimated project costs of approximately $83,000.

Cost Saving Alternatives

Alternatives for reducing the overall project cost include reducing the length of restoration and eliminating some or all the buffer enhancement work (treating/removing invasives, enhancing/restoring vegetation, and three years of maintenance). The Commission Engineer reprioritized sites based on changed site conditions and revised the project costs associated with the high, medium, and low priority sites presented in the feasibility study.

Table 1 includes information originally presented in the Options Cost Summary from the feasibility study, adjusted to align with new priority rankings based on changed site conditions and updated project costs. These costs also include establishing native vegetative buffer along the stream's edge on properties where work is occurring. For feasibility assessment of cost, restoration length, and pollutant reductions, refer to the feasibility study.

Table 1. Project Alternatives Cost Summary with (Feasibility Study Estimates)

Alternative	Project Construction Cost Estimate	Stream Length Repaired (ft)	TP Load Reduction (lb/yr)	TSS Load Reduction (lb/yr)
Alternative 1 – High-ranked restoration areas	$1,346,000 ($833,000)	4,085 (4,340)	80.2 (54.4)	165,050 (109,618)
Alternative 2 – High- and medium-ranked restoration areas	$2,003,000 ($1,279,000)	7,465 (5,425)	134.4 (67.0)	270,350 (136,695)
Alternative 3 – High-, medium-, and low-ranked priority areas	$2,372,000 ($1,568,000)	8,610 (7,370)	190.6 (82.4)	381,130 (163,820)

The Engineer also calculated costs associated with two optional project add-ons:

Optional Add-on One: Removing invasives and establishing native vegetation in publicly-owned parcels adjacent to the creek between Regent Avenue and Golden Valley Road, as shown in the 50% drawings.

Optional Add-on Two: Removing invasives and establishing native vegetation in privately-owned parcels along the creek between Regent Avenue and Golden Valley Road in locations that are not part of the project area (i.e. do not have any structures, grading, etc. planned as part of the restoration project work).

Table 2 presents the pros and cons for the three prioritized alternatives along with the optional add-ons.

Table 2. Comparison of Alternatives

Alternative	Project Pros	Project Cons
Alternative 1 – High-ranked restoration areas	• Lowest installation cost; reduces total project cost to $1,346,000, which is $222,000 less than the ordered project construction budget of $1,568,000. • Smallest project area; least amount of disturbance • Removes the fewest trees • Requires the fewest landowner agreements and easements	• Addresses smallest amount of priority eroding areas and associated pollutant removals • Lowest potential for economy of scale; unit costs may be higher than for a larger project Would require a return to the project site if low or medium priority sites are addressed in the future
Alternative 2 – High- and medium-ranked restoration areas	• Lower installation cost than Alternative 3; reduces total project cost to $2,003,000, which is $435,000 more than the ordered project construction budget of $1,568,000. • Fewer trees removed than Alternative 3 • Fewer landowner agreements and easements than Alternative 3	• Would require $435,000 additional funding beyond what was identified when the Commission ordered the project • Requires more landowner agreements and easements than Alternative 1 • Addresses fewer sites and associated pollutant removal than Alternative 3
Alternative 3 – High-, medium-, and low-ranked priority areas	• Addresses all priority eroding streambanks and associated pollutant loading • Allows for economy of scale (larger project could result in lower unit costs) • Practicality of completing all work in the area at once	• Highest-cost alternative; requires $804,000 additional funding beyond what was identified when the Commission ordered the project. • Requires the largest number/area of landowner agreements and easements
Optional Add-on One - Include invasive removal and vegetation enhancement on publicly-owned property adjacent to the creek	• Improves floodplain and riparian vegetation quality and habitat on public lands	• Higher cost than base alternatives; would require $99,000 additional funding beyond what was identified when the Commission ordered the project.
Optional Add-on Two – Include invasive removal and vegetation enhancement on privately-owned property adjacent to the creek	• Combined with Optional Add-on One, improves the largest area of vegetation quality and habitat within the stream floodplain and riparian area	• Higher cost than base alternatives; would require $121,000 additional funding beyond what was identified when the Commission ordered the project. • Requires additional private landowner agreements beyond those needed for any of the base alternatives

The project as ordered by the Commission included streambank restoration of all high, medium ,and low priority sites. Construction plus contingency costs were originally estimated at $1,568,000. The following table shows updated costs for each alternative and "add-ons" from Table 2.

Option	Option Cost	Option + Add-on one	Option + Add-on one and Add-on two
Alternative #1 high priority only	$1,346,000	$1,445,000	$1,566,000
Alternative #2 high and medium priority	$2,003,000	$2,102,000	$2,223,000
Alternative #3 High, medium, low priority	$2,372,000	$2,471,000	$2,592,000

Grant Opportunities and Additional Levy

If the selected alternative by the Commission has a higher construction cost than the original construction budget, the increased construction cost may be offset by one or more grants.

The Minnesota Department of Natural Resources recently issued a Request for Proposal for the Conservation Partners Legacy (CPL) Grant. Grant awards range from $5,000 to $500,000 for projects to restore, protect, or enhance wetlands, forests, or habitat for fish, game, or wildlife in Minnesota. Projects are funded on lands that are permanently protected by a conservation easement, in public ownership, or in public waters. The program requires a 10% match of non-state funds. The Commission could opt to apply for this grant which is due by September 16, 2025.

Additional potential grants could be pursued in 2026 including a BWSR Clean Water Fund Competitive Grant or a Hennepin County Opportunity Grant.

Additional funding could also come from a 2027 levy. Although the current list of 2027 CIP projects includes $1M for the next project in the Medicine Lake Rd & Winnetka Ave Long Term Flood Mitigation Plan in Golden Valley, the city has indicated it will not be ready to implement that project before 2028. Therefore, there is "room" in the 2027 CIP levy to include additional funding for this stream restoration project, if needed.

Recommendation

1. Select an alternative and authorize Commission Engineer to continue design and bring 90% design to a future Commission meeting
2. If selected alternative is more expensive than budgeted, consider amending the project budget and amending reimbursement agreement with City of Golden Valley.

Attachment: Supplemental information on invasive removal and benefits of native vegetation

(Note: The information below is updated from the information provided to the Commission in a June 2023 memo regarding the Ponderosa Woods Stream Restoration Project Feasibility Study.)

Portions of the project area on public and private land are degraded and dominated by buckthorn on streambanks and in the riparian area (including the floodplain). In areas where buckthorn was present, there was little to no understory vegetation present during the April 2025 field visit. Other portions of the project area are also dominated by invasives other than buckthorn. Areas with other types of invasive species (e.g. tansy, honeysuckle, thistle) prevent native and non-native desirable species from flourishing. All the design alternatives with vegetation management components include removal of buckthorn and other invasives to help restore these project areas – along the streambanks, and in the floodplain and riparian areas.

The riparian area extends from the stream channel to the edge of the floodplain as shown in Figure 2. Riparian areas include vegetation species that are more water-tolerant, whereas upland vegetation tends to prefer less water. In the case of buckthorn, it resides both in riparian and upland areas because it can tolerate both wetter and drier habitats. Because buckthorn grows well in both habitats, it can grow to be pervasive throughout a large area, degrading both riparian and upland areas. For the Bassett Creek Main Stem Restoration project area, the riparian area may extend to the limits of the project area or beyond as shown on the attached Figure 1; further field investigations would be necessary to determine the exact extents of the riparian area. The floodplain forest wetland area shown in Figure 1 approximates the riparian and floodplain area based on elevations included in the BCWMC XP SWMM model for this reach.

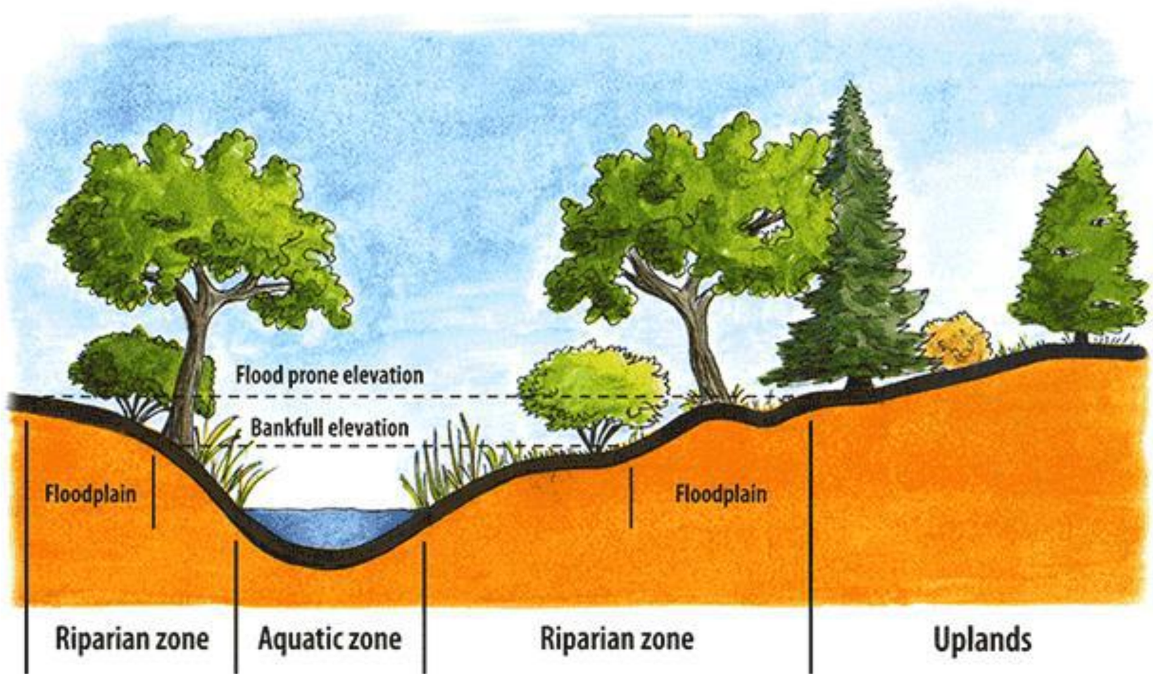
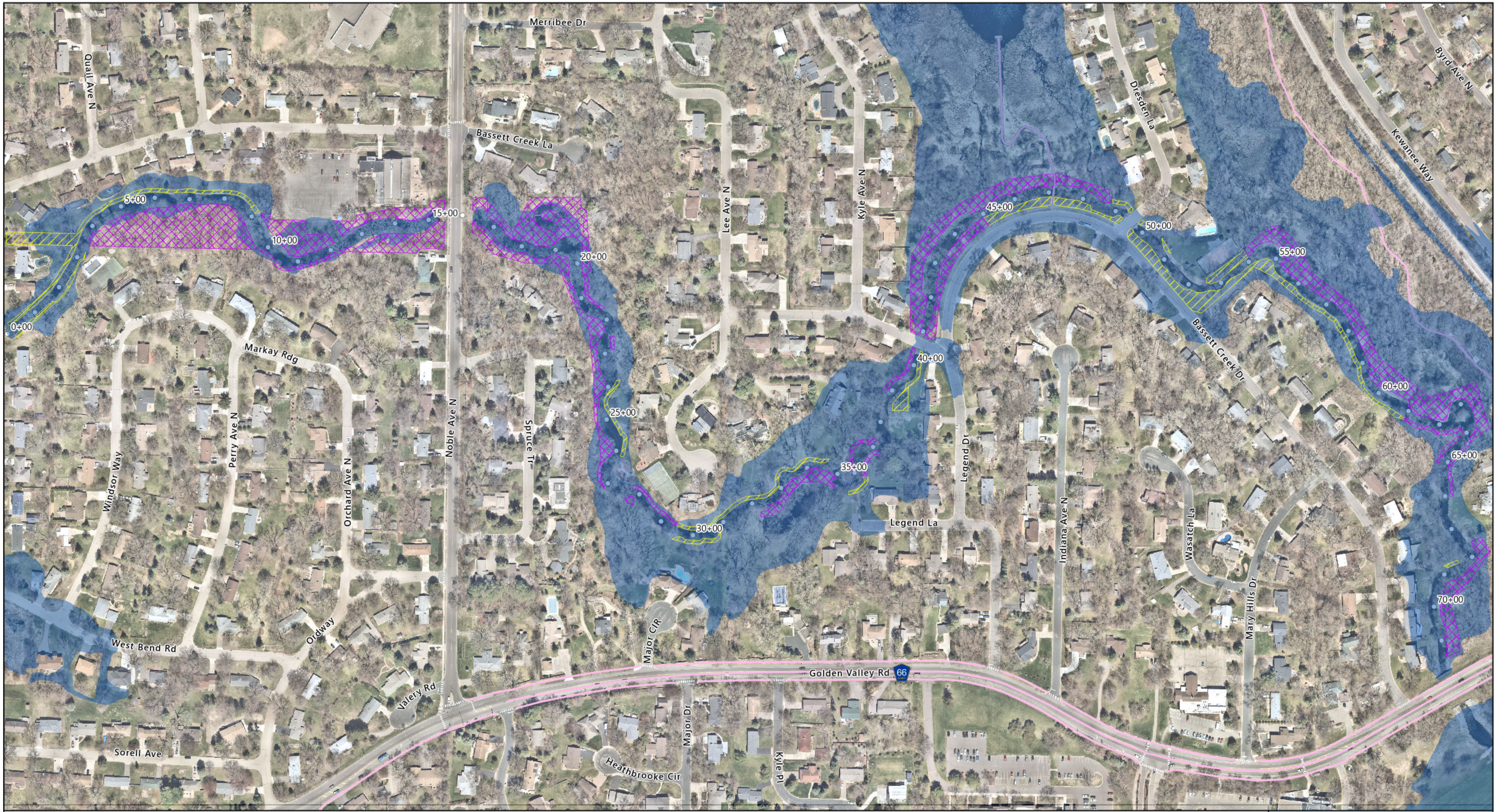


Figure 2. Riparian Versus Upland Areas (Reference 3)



Legend

- Lawn
- Wooded
- 100-year Floodplain
- Project Stationing

Vegetation Type and Floodplain Near the Project Area

FIGURE 1

Barr footer:

The following are qualitative benefits for buckthorn removal and revegetation of the understory vegetation:

- Buckthorn shades out the understory vegetation, which leads to exposed soils and increased erosion potential (more sediment runoff) to the stream and downstream water bodies.

- Removing buckthorn and other degraded trees opens up the tree canopy and allows sunlight to reach the ground to promote understory vegetation growth (including native plants). This decreases the amount of exposed soil, which can improve water quality by preventing sediment from entering the stream.

- Buckthorn will continue to re-seed the area if not removed.

- More buckthorn removal leads to more water quality and habitat improvements.

In previous work associated with the Ponderosa Woods Stream Restoration Project Feasibility Study project, the Commission Engineer sought to find additional quantitative information on the benefits of buckthorn removal and revegetation of the understory vegetation on phosphorus and sediment load reductions to streams and other water bodies. There is limited quantitative information available; the following information is a summary of some of the additional information available from the literature review completed in 2023:

Preliminary research shows buckthorn's impact on carbon and nitrogen cycles and on increased areas of exposed soils (References 4, 5, and 6). Researchers found that carbon and nitrogen can accumulate beneath buckthorn at a higher rate and will eventually accumulate within the carbon and nitrogen cycling within the soil. This is potentially due to its higher productivity of leaf litter, which also has been shown to decompose at a faster rate than native plants. The quick decomposition of leaf litter that occurs beneath the buckthorn may also result in a higher leaching rate of nitrogen. Though phosphorus was not evaluated in the research, it is possible to infer that there would also be a higher leaching rate of phosphorus.

Researchers also found that the increase in carbon and nitrogen levels attract another invasive species, the earthworm, and together they can quickly demolish the leaf litter layer and expose the soil. Once the soil is exposed, it is more prone to erosion and can alter the structure of the forest floor.

Buckthorn is present in both riparian and upland areas along Bassett Creek. Of special concern are exposed soils in the riparian area resulting from increased amounts of buckthorn. Loose soils may be eroded during higher flow events that reach the riparian areas (and therefore the floodplain).