

**HOBSON CREEK CORRIDOR RESTORATION PROJECT, PHASE 1  
TRIBUTARY 6 TO THE EAST BRANCH DUPAGE RIVER**

**Section 319 Project Report**  
Illinois EPA Agreement No. 3190213



Illinois Environmental Protection Agency  
Bureau of Water  
Watershed Management Section

December 2004



**HOBSON CREEK CORRIDOR RESTORATION PROJECT, PHASE 1  
TRIBUTARY 6 TO THE EAST BRANCH DUPAGE RIVER  
SECTION 319 FINAL REPORT**

**ILLINIOS EPA FAA # 3190213  
DECEMBER 2004**

**Prepared For:**

**ILLINOIS ENVIRONMENTAL PROTECTION AGENCY  
BUREAU OF WATER - WATERSHED MANAGEMENT SECTION  
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This report was prepared using United States Environmental Protection Agency funds under Section 319 of the Clean Water Act distributed through the Illinois Environmental Protection Agency. The findings and recommendations contained herein are not necessarily those of the funding agencies.

# HOBSON CREEK CORRIDOR RESTORATION PROJECT

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### **Summary:**

The Hobson Creek Community Council completed the Hobson Creek Corridor Restoration Project, Phase 1 in order to protect against severe streambank erosion, to provide nonpoint source pollution control along Hobson Creek and to improve water quality of the downstream East Branch DuPage River. Installed stream stabilization techniques have provided effective and environmentally sound bank protection and channel stability for the Phase 1 reach. The Hobson Creek Community Council will provide long-term maintenance for the project site. Public involvement to date includes awareness of adjacent homeowners, numerous trail and parkway visitors near existing signage, and publication of three newspaper articles, one environmental newsletter article, and three professional trade magazine publications.

### **Introduction:**

The Hobson Creek Corridor Restoration Project is located on common space owned by the Hobson Creek Community Council in unincorporated Naperville, DuPage County, Illinois. A small portion of the project area is located on private property within the Hobson Creek Community subdivision where the stream has migrated out of the subdivision common space. Hobson Creek has a 1.71 square mile watershed. The watershed is primarily comprised of single family and multi-family residential areas. Hobson Creek has also been identified as Tributary #6 to the East Branch DuPage River. The East Branch DuPage River is located approximately 1,100 linear feet downstream of the project site. The entire Hobson Creek Corridor has been divided into 3 reaches for construction implementation purposes:

- Phase 1 – Upstream project boundary downstream to stream station 10+00 (Sta. 17+50 to 10+00)
- Phase 2 – Stream station 10+00 downstream to Green Trails Drive (Sta. 10+00 to 3+50)
- Phase 3 – Green Trails Drive downstream to Woodridge Park District (Sta. 3+50 to 0+00) and also the Hobson Creek Inlet Channel (additional 250 linear feet)

The Phase 1 project area is the subject of this Final Report. Phase 1 included a 750 linear-foot length of stream which had severely eroded streambanks and 1.61 acres of degraded riparian corridor. Severe streambank erosion was due several factors. Most of the watershed was developed prior to the enforcement of stormwater detention ordinances, resulting in the rapid discharge of large volumes of urban runoff. The streambank riparian corridor was impacted by a dense canopy of invasive shrubs including Buckthorn (*Rhamnus cathartica*) and Honeysuckle (*Lonicera tatarica*). The highly eroded streambanks contain little to no ground-stabilizing vegetation. This provided little functional benefit and contributed to site degradation. The stream channel had also incised approximately one to two feet into the landscape. Moreover, significant channel widening has occurred. There are several locations where bank erosion had forced channel migration out of the common space area into rear yards of individual townhome units. In some areas the streambanks were within 12 feet of undermining structural home foundations and within 5 feet of buried utilities. The Illinois EPA Load Reduction Spreadsheet was utilized to quantify the significant sediment delivery to the East Branch of the DuPage River as described below under Project Benefits.

A primary objective of the Hobson Creek Corridor Restoration Project was to improve the water quality in the project area and to reduce the sediment loading caused by streambank erosion into Hobson Creek and the East Branch DuPage River. This objective was accomplished by extensive streambank stabilization, installation of channel grade control structures, removal of invasive shrub species in the riparian area, and installation of native plantings along the stabilized streambanks and within the riparian area.



Location Map



**Project Schedule**

Table 1 below indicates the project schedule and completion requirements. Permits were received on September 24, 2003. Construction began September 30, 2003 and native planting installations (native shrub live stakes (and previously herbaceous plant plugs) were completed on December 9, 2004 according to approved Plans and Specifications.

**Table 1: Project Schedule.**  
**Hobson Creek Corridor Restoration Project, Phase 1.**  
 IEPA FAA 3190213.

| Action Item                           | Start Date     | Completion Date *   |
|---------------------------------------|----------------|---------------------|
| FAA 3190213 Award                     | Feb. 18, 2003  | Feb. 30, 2005       |
| Design Engineering                    | March 1, 2003  | May 26, 2003        |
| Permitting                            | May 27, 2003   | Sept. 24, 2003      |
| Bidding                               | August 1, 2003 | August 20, 2003     |
| Construction Contract Award           | N/A            | August 25, 2003     |
| Riparian Invasive Species Removal     | Sept. 30, 2003 | Oct. 15, 2003       |
| Streambank Stabilization Construction | Oct. 10, 2003  | June 30, 2004       |
| Native Plantings                      | Oct. 15, 2003  | Dec. 9, 2004        |
| Project Final Report                  |                | <b>Jan. 7, 2005</b> |

\* Items in **Bold** are expected completion dates.

**Project Description and Stabilization Techniques**

The Hobson Creek Corridor Restoration Project, Phase 1 included lead engineering, surveying and drafting by Patrick Engineering, Inc. Stream stabilization design, native planting selection, construction observation, and maintenance assistance was provided by Ted Gray & Associates, Inc. Landscape Resources, Inc. provided construction services and will provide a minimum of 3-years of site maintenance. The best management practices described below were utilized to restore the riparian corridor and to stabilize the streambanks of the mainstem of Hobson Creek and the south tributary stream channel (which discharges to mainstem at stream station 16+25).

**Restoration of Riparian Corridor**

Hobson Creek Corridor Restoration included vegetation management with replacement of 1.61 acres of dense stands on non-native and invasive shrubs and trees (such as Buckthorn) with 45 native tree-shrub clusters, along with native herbaceous species. The replacement of undesirable vegetation with native species prevents loss of bank soils and promotes bank stability. This will reduce non-point source pollutant loadings to the downstream East Branch DuPage River. Replacement of invasive species with native tree and shrub clusters, grasses, and forbs will also promote filtration and assimilation of nutrients as well as contaminated runoff that can be discharged from surrounding upland areas. Aquatic habitat along the Hobson Creek riparian corridor will be enhanced and diversified.

**Table 2: Streambank Stabilization Practices.**

| <b>Stabilization Practice</b>         | <b>Left Bank<br/>(LF)</b> | <b>Right Bank<br/>(LF)</b> | <b>Total<br/>(LF)</b> |
|---------------------------------------|---------------------------|----------------------------|-----------------------|
| 1-Row A-Jacks / Vegetated Geogrid     | 0                         | 86                         | 86                    |
| 3-Row A-Jacks / Vegetated Geogrid     | 93                        | 355                        | 448                   |
| 3-Row A-Jacks / Re-Shape Slope        | 40                        | 0                          | 40                    |
| Fiber Roll / Re-Shaped Slope          | 145                       | 40                         | 185                   |
| Rock Riffles (3 @ 25 LF per bank)     | 75                        | 75                         | 150                   |
| Toe-of-Slope Native Plantings Only    | 80                        | 70                         | 150                   |
| Widen Channel / Re-Shape Slope        | 120                       | 130                        | 250                   |
| Rock Placement At Storm Pipe Outfalls | 50                        | 20                         | 70                    |
| <b>Total (LF)</b>                     | <b>603</b>                | <b>776</b>                 | <b>1379</b>           |

### Rock Riffle Structures and Stable Channel Construction

Severe channel downcutting has been controlled with installation of rock riffle grade control structures. Riffles not only control channel downcutting but also dissipate excess stream energy and reduce extremely high erosive forces against the streambanks. Three (3) rock riffles were installed in the Phase 1 project area. Materials utilized ranged from 0.5-inch subsurface gravel to 18-inch surface boulders. The rock riffle structures also diversify and improve in-stream habitat, diversify stream substrate materials, and enhance aesthetics. Channel widening was performed in selected areas to re-construct a stable stream channel configuration in areas which had become severely downcut. Approximately 250 cubic yards of excavation was performed to re-construct a stable baseflow channel along approximately 250 linear feet of the stream reach.

### A-Jacks and Vegetated Geogrid

Streambank stabilization was the most important feature to prevent additional soil pollutant transport throughout Hobson Creek and the downstream East Branch DuPage River. In the more severely eroded areas, the streambanks were graded to a flatter slope (excess cut removed), seeded and planted using native vegetation (described below), stabilized with vegetated geogrid (Bio-D Block), with toe of slope protection using 1 row or 3 rows of A-jacks. The permanent A-Jacks structures have a high energy-dissipation capability. The vegetated geogrid provided biodegradable erosion control along tall slopes as steep as 2.5:1 (H:V). These techniques were suited for areas that could be stabilized with vegetation alone, such as areas with high flow velocities along erodible soils, and where high bank shear stresses and sharp meander bends occur. A-Jacks biotechnical measures were also utilized where the stream channel migrated out of the common area into private lands and where the erosion threatened building structures or private properties. Approximately 488 linear feet of 3-rows a-jacks were installed, as well as 86 linear feet of 1-row a-jacks. All of the a-jacks were installed with bio-d block vegetated geogrid above the a-jacks with the exception of 40 linear feet of 3-row a-jacks which were installed with a re-shaped slope.

### Fiber Roll and Re-Shaped Slopes

Streambanks with moderate erosion were lightly graded back, on a cut-and-fill balance, seeded and planted with native plant vegetation, covered with an erosion control blanket, with toe (base) stabilization using coconut (coir) fiber roll. Areas exhibiting only minor erosion were stabilized by re-shaping bank slopes, seeding and planting with native vegetation, and installing erosion control blanket. Plant communities were improved by removing the non-native / invasive vegetation, as well as introducing rooted plant materials. Approximately 185 linear feet of fiber roll were installed with re-shaped slopes above the fiber roll.

### Rock Placement At Storm Pipe Outfalls

Existing storm pipe outfalls were stabilized by re-placing rock that had previously been removed by the erosive force of the flowing stream. There were two storm pipe outfalls which were stabilized using rock. The left bank contained a storm pipe outlet near stream station 14+75. This pipe contained a 25-foot long outlet ditch leading to Hobson Creek. The pipe outfall and ditch were stabilized by installing a rock toe, re-shaped slopes, and shrub live stakes along 50 linear feet which includes both banks of the outfall ditch. The right bank at stream station 11+90 contained a storm pipe outfall which previously contained little to no rock protection. This outfall was stabilized using a rock wall over 20 linear feet in length that was built up to the height of the top of the outfall pipe. The total length of streambank protected by rock placement near storm pipe outfalls was 70 linear feet.

### Native Plantings

Proper selection and installation of native plantings and seed is instrumental to project success. Native seed and plantings were installed along all stabilized streambank areas. Effective native plant installations improve long-term streambank stabilization, pollutant filtration, wildlife habitat, dissipation flow energy, and improvement of site aesthetic values. Toe-of-slope (Type 1) native seed and plug lists, and mid-slope to upper slope native seed (Type 2) plug lists are provided in Tables 3 and 4 below. Native shrub live stakes (cut live stems) were utilized in shaded areas with high erosive forces (Table 5). Approximately 150 linear feet of stream channel was stabilized using native plantings alone without other streambank stabilization treatments. Also, as described above under Restoration of Riparian Corridor, forty-five (45) native tree-shrub clusters were installed throughout the riparian area. The ball-and-burlap tree and shrub species used for the tree-shrub clusters are described in Table 6.

**Table 3. Native Herbaceous Plant Plugs Species List.**

| <u>Scientific Name</u>           | <u>Common Name</u>  | <u>Percent of Total</u> |
|----------------------------------|---------------------|-------------------------|
| <u>Type 1 Native Plant Plugs</u> |                     |                         |
| Acorus calamus                   | Sweet Flag          | 5%                      |
| Andropogon gerardii              | Big Bluestem        | 10%                     |
| Andropogon scoparius             | Little Bluestem     | 5%                      |
| Asclepias incarnata              | Swamp Milkweed      | 5%                      |
| Carex stipata                    | Common Fox Sedge    | 5%                      |
| Elymus virginicus                | Virginia Wild Rye   | 3%                      |
| Hystrix patula                   | Bottlebrush Grass   | 3%                      |
| Iris virginica                   | Blue Flag Iris      | 10%                     |
| Juncus tenuis                    | Path Rush           | 5%                      |
| Panicum virgatum                 | Switch Grass        | 14%                     |
| Scirpus acutus                   | Hardstem Bulrush    | 5%                      |
| Scirpus cyperinus                | Wool Grass          | 5%                      |
| Sorghastrum nutans               | Indian Grass        | 10%                     |
| Spartina pectinata               | Prairie Cord Grass  | 10%                     |
| Verbena hastata                  | Blue Vervain        | <u>5%</u>               |
|                                  |                     | 100%                    |
| <u>Type 2 Native Plant Plugs</u> |                     |                         |
| Allium cernuum                   | Nodding Wild Onion  | 3%                      |
| Andropogon scoparius             | Little Bluestem     | 3%                      |
| Aster novae-anglia               | New England Aster   | 6%                      |
| Ceanothus americanus             | New Jersey Tea      | 3%                      |
| Echinacea purpurea               | Purple Coneflower   | 9%                      |
| Elymus canadensis                | Wild Canada Rye     | 6%                      |
| Elymus virginica                 | Virginia Canada Rye | 4%                      |
| Eurythronium americanum          | Trout Lily          | 3%                      |
| Eupatorium maculatum             | Joe-Pye Weed        | 5%                      |
| Helianthus grosseserratus        | Sawtooth Sunflower  | 3%                      |
| Juncus tenuis                    | Path Rush           | 3%                      |
| Lobelia cardinalis               | Cardinal Flower     | 3%                      |
| Lobelia siphilitica              | Great Blue Lobelia  | 3%                      |
| Monarda fistulosa                | Bergamont           | 5%                      |
| Panicum virgatum                 | Switch Grass        | 9%                      |
| Parthenium integrifolium         | Quinine             | 3%                      |
| Pycnanthemum virginianum         | Mountain Mint       | 3% <sup>c</sup>         |
| Ratibida pinnata                 | Yellow coneflower   | 3%                      |
| Solidago speciosa                | Showy Goldenrod     | 3%                      |
| Solidago patula                  | Swamp Goldenrod     | 3%                      |
| Sporobolous heterolepsis         | Prairie Dropseed    | 6%                      |
| Tradescantia ohiensis            | Spiderwort          | 3%                      |
| Trillium erectum                 | Trillium            | 3%                      |
| Zizia aurea                      | Golden Alexander    | <u>5%</u>               |
|                                  |                     | 100%                    |

**Table 4. Native Plant Seed List.**

| <u>Scientific Name</u>          | <u>Common Name</u>  | <u>Percent of Total</u> |
|---------------------------------|---------------------|-------------------------|
| <u>Type 1 Native Plant Seed</u> |                     |                         |
| Aster laevis                    | Smooth Aster        | 3%                      |
| Aster novae-anglia              | New England Aster   | 3%                      |
| Andropogon gerardii             | Big Bluestem        | 3%                      |
| Andropogon scoparius            | Little Bluestem     | 5%                      |
| Avena sativa                    | Seed Oats           | 10%                     |
| Carex stipata                   | Common Fox Sedge    | 5%                      |
| Elymus canadensis               | Wild Canada Rye     | 5%                      |
| Elymus virginica                | Virginia Canada Rye | 3%                      |
| Gentiana andrewsii              | Bottle Gentian      | 3%                      |
| Gilardia pulchella              | Indian Blanket      | 5%                      |
| Iris virginica                  | Blue Flag Iris      | 5%                      |
| Lolium multiflorum              | Annual Rye          | 12%                     |
| Panicum virgatum                | Switch Grass        | 6%                      |
| Phlox divartica                 | Blue Phlox          | 2%                      |
| Rudbeckia hirta                 | Black-Eyed Susan    | 10%                     |
| Scirpus acutus                  | Hardstem Bulrush    | 5%                      |
| Sorghastrum nutans              | Indian Grass        | 3%                      |
| Spartina pectinata              | Prairie Cord Grass  | 6%                      |
| Tradescantia ohiensis           | Spiderwort          | 3%                      |
| Verbena hastata                 | Blue Vervain        | <u>3%</u>               |
|                                 |                     | 100%                    |
| <u>Type 2 Native Plant Seed</u> |                     |                         |
| Allium cernuum                  | Nodding Wild Onion  | 3%                      |
| Andropogon scoparius            | Little Bluestem     | 6%                      |
| Aquilegia canadensis            | Columbine           | 3%                      |
| Avena sativa                    | Seed Oats           | 10%                     |
| Cassia fasciculata              | Partridge Pea       | 3%                      |
| Echinacea purpurea              | Purple Coneflower   | 5%                      |
| Elymus canadensis               | Wild Canada Rye     | 5%                      |
| Eupatorium perfoliatum          | Boneset             | 5%                      |
| Lolium multiflorum              | Annual Rye          | 10%                     |
| Panicum virgatum                | Switch Grass        | 9%                      |
| Parthenium integrifolium        | Quinine             | 5%                      |
| Ratibida pinnata                | Yellow coneflower   | 5%                      |
| Rudbeckia hirta                 | Black-Eyed Susan    | 8%                      |
| Solidago speciosa               | Showy Goldenrod     | 5%                      |
| Solidago patula                 | Swamp Goldenrod     | 5%                      |
| Sporobolous heterolepsis        | Prairie Dropseed    | 5%                      |
| Veronica fasciculata            | Ironweed            | <u>3%</u>               |
|                                 |                     | 100%                    |

**Table 5. Native Shrub Live Stakes.**

| <u>Scientific Name</u> | <u>Common Name</u>  | <u>Percent of Total</u> |
|------------------------|---------------------|-------------------------|
| Cornus stolonifera     | Red-Osier Dogwood   | 40%                     |
| Cornus racemosa        | Gray Dogwood        | 10%                     |
| Salix Interior         | Sandbar Willow      | 20%                     |
| Viburnum dentatum      | Arrowwood Viburnum  | 15%                     |
| Viburnum lentago       | Nannyberry Viburnum | <u>15%</u>              |
|                        |                     | 100%                    |

**Table 6. Native Tree-Shrub Clusters.**

| <u>Scientific Name</u>    | <u>Common Name</u>  | <u>Percent of Total</u> |
|---------------------------|---------------------|-------------------------|
| <u>Trees</u>              |                     |                         |
| Juglans nigra             | Black Walnut        | 25%                     |
| Platanus occidentalis     | American Sycamore   | 25%                     |
| Tilia americana           | Basswood            | 25%                     |
| Quercus bicolor           | Swamp White Oak     | <u>25%</u>              |
|                           |                     | 100%                    |
| <u>Shrubs</u>             |                     |                         |
| Cephalanthus occidentalis | Button Bush         | 25%                     |
| Cornus stolonifera        | Red-Osier Dogwood   | 15%                     |
| Salix Interior            | Sandbar Willow      | 15%                     |
| Sambucus canadensis       | Elderberry          | 15%                     |
| Viburnum dentatum         | Arrowwood Viburnum  | 15%                     |
| Viburnum lentago          | Nannyberry Viburnum | <u>15%</u>              |
|                           |                     | 100%                    |

**Project Costs and Quantities**

A summary of quantities and costs are listed below.

**Table 7: Summary of Quantities.**

**BASE BID SCHEDULE OF QUANTITIES AND PRICES**

| <b>Item No.</b> | <b>Stream Restoration Practice</b>                            | <b>Quantity</b> | <b>Units</b> | <b>Unit Cost</b> | <b>Extended Cost</b> |
|-----------------|---|-----------------|--------------|------------------|----------------------|
| 1               | <b>Selective Removal of Invasive Species</b>                  | <b>1.61</b>     | ACRES        | \$7,000.00       | \$11,270.00          |
| 2               | <b>Tree Removal, 6" to 12" Diameter</b>                       | <b>8</b>        | EA           | \$121.00         | \$968.00             |
| 3               | <b>Tree Removal, Over 12" Diameter</b>                        | <b>3</b>        | EA           | \$240.00         | \$720.00             |
| 4               | <b>Rock Riffle Structures</b>                                 | <b>3</b>        | EA           | \$2,888.00       | \$8,664.00           |
| 5               | <b>Fiber Roll</b>   | <b>185</b>      | LF           | \$34.00          | \$6,290.00           |
| 6               | <b>1-Row A-Jacks</b>  | <b>81</b>       | LF           | \$46.00          | \$3,726.00           |
| 7               | <b>3-Row A-Jacks</b>  | <b>488</b>      | LF           | \$86.00          | \$41,968.00          |
| 8               | <b>Vegetated Geogrid (Bio-D Block)</b>                        | <b>1064</b>     | LF           | \$30.00          | \$31,920.00          |
| 9               | <b>Re-Shaped Slope / Erosion Control Blanket</b>              | <b>311</b>      | LF           | \$26.00          | \$8,086.00           |
| 10              | <b>Excavation of Stable Baseflow Channel</b>                  | <b>250</b>      | CY           | \$38.00          | \$9,500.00           |
| 11              | <b>Rip-rap Installation</b>                                   | <b>9</b>        | CY           | \$185.00         | \$1,665.00           |
| 12              | <b>Native Tree / Shrub Clusters in Riparian Corridor</b>      | <b>45</b>       | EA           | \$217.00         | \$9,765.00           |
| 13              | <b>Native Shrub Live Stakes (3 per 1 LF)</b>                  | <b>140</b>      | LF           | \$23.00          | \$3,220.00           |
| 14              | <b>Native Shrub Live Stakes (1 per 6 LF)</b>                  | <b>70</b>       | LF           | \$2.00           | \$140.00             |
| 15              | <b>Native Plant Plugs (2-in. potted plants) at 2 per 1 LF</b> | <b>70</b>       | LF           | \$6.00           | \$420.00             |
| 16              | <b>Post-Project Construction Fence</b>                        | <b>500</b>      | LF           | \$2.00           | \$1,000.00           |
| 17              | <b>Erosion Control &amp; Maintenance</b>                      | <b>1</b>        | LS           | \$4,263.00       | \$4,263.00           |
| 18              | <b>Rooftop Downspout Management</b>                           | <b>1</b>        | LS           | \$3,600.00       | \$3,600.00           |
| 19              | <b>Project Signs</b>  | <b>2</b>        | EA           | \$1,572.00       | \$3,144.00           |
| 20              | <b>Construction Access &amp; Restoration</b>                  | <b>1</b>        | LS           | \$1,592.00       | \$1,592.00           |
| 21              | <b>3-Year Vegetative Perf. Standards and Guarantee</b>        | <b>1</b>        | LS           | \$12,198.00      | \$2,439.60           |
| CO001           | Outfall Structure Rip-rap & re-shaping                        | 1               | LS           | \$1,271.49       | \$1,271.49           |
| CO002           | Decale for Signs  | 2               | LS           | \$50.00          | \$100.00             |
| CO003           | Wildflower Seeding  | 1               | LS           | \$957.00         | \$957.00             |
| <b>Total</b>    |   |                 |              |                  | <b>\$156,689.09</b>  |

**ITEMS AS ORDERED BY ENGINEER**

| <b>IAOE #</b> | <b>Stream Restoration Practice</b>               | <b>Quantity</b> | <b>Units</b> | <b>Unit Cost</b> | <b>Extended Cost</b> |
|---------------|--|-----------------|--------------|------------------|----------------------|
| <b>3a</b>     | <b>1-Row A-Jacks</b>                             | <b>5</b>        | LF           | \$46.00          | \$230.00             |
| <b>3d</b>     | <b>Re-Shaped Slope / Erosion Control Blanket</b> | <b>14</b>       | LF           | \$26.00          | \$364.00             |
| <b>Total</b>  |  |                 |              |                  | <b>\$594.00</b>      |

**Total Contractor Costs to Date: \$157,283.09**

Table 8: Project Cost Summary.  
Hobson Creek Corridor Restoration Project, Phase 1.  
IEPA FAA 3190213.

| Project Cost Summary                  | Total Cost to Date | Local Match Share | Grant Assistance Amount |
|---------------------------------------|--------------------|-------------------|-------------------------|
|                                       |                    |                   |                         |
| <b>Clerical</b>                       | \$0.00             | \$0.00            | \$0.00                  |
| <b>Supervisor</b>                     | \$0.00             | \$0.00            | \$0.00                  |
| <b>DIRECT LABOR</b>                   | \$0.00             | \$0.00            | \$0.00                  |
|                                       |                    |                   |                         |
| <b>Fringe Benefits</b>                | \$0.00             | \$0.00            | \$0.00                  |
| <b>Overhead Costs</b>                 | \$0.00             | \$0.00            | \$0.00                  |
| <b>INDIRECT COSTS</b>                 | \$0.00             | \$0.00            | \$0.00                  |
|                                       |                    |                   |                         |
|                                       |                    |                   |                         |
| <b>EQUIPMENT, MATERIALS, SUPPLIES</b> | \$0.00             | \$0.00            | \$0.00                  |
|                                       |                    |                   |                         |
| <b>Engineering</b>                    | \$48,629.47        | \$19,451.79       | \$29,177.68             |
| <b>Permit Fees &amp; Legal Fees</b>   | \$10,786.34        | \$4,314.54        | \$6,471.80              |
| <b>Streambank Stabilization</b>       | \$157,283.09       | \$95,759.58       | \$61,523.51             |
|                                       |                    |                   |                         |
| <b>SUBCONTRACTS</b>                   | \$216,698.90       | \$119,525.90      | \$97,173.00             |
|                                       |                    |                   |                         |
|                                       |                    |                   |                         |
| <b>Totals</b>                         | \$216,698.90       | \$119,525.90      | \$97,173.00             |

IEPA Grant Award: \$107,970.00  
**Balance of Award: \$10,797.00**

**Operation and Maintenance Plan**

Maintenance of native plantings along the stabilized streambanks and within the riparian corridor is critical to project success. The Hobson Creek Community Council will take responsibility for the EPA Section 319 grant 10-year Operations & Maintenance agreement for streambank bioengineering protection measures and plant maintenance. The following are provisions for this Agreement.

**Bioengineering Materials Inspections**

Bioengineering materials inspections for the constructed streambank stabilization area will occur at least two times per year according to the attached schedule in Table 9. Repairs will be made as necessary, as determined by the Owner and their designated Representative.

1. A-Jacks: Inspections will occur for dislodgement or relocation of A-Jacks components if any, broken pieces, or other indications of potential stabilization concerns.
2. Fiber Roll: Inspections will occur for the staking, undercutting, cord fasteners, and integrity of the Fiber Roll.
3. Rock Riffles: Some rock displacement at the riffles is expected, but significant relocation of larger rock materials is not desirable. Major relocation of rock will be inspected and noted.
4. Re-Shaped Slopes and Vegetated Geogrid: The performance of the re-shaped slopes and vegetated geogrid to stabilize the site slopes will be inspected. Growth of vegetation and locations requiring additional planting will be inspected. Eventually, the vegetated geogrid will biodegrade presumably within a few years. The capability of plantings to stabilize the resulting angle of repose will be noted.

### Native Plant Maintenance

Conditions will be monitored and maintenance will be performed as described in the attached schedule. Native plant maintenance will occur using spot herbicide applications, hand removal of nuisance weeds, and related activities performed at least three times per year per the attached schedule. Non-native species will be removed from the streambank stabilization area.

### Maintenance Costs

We estimate that the annual site maintenance budget will be approximately \$5,000 annually, primarily to control re-introduced invasive species such as Buckthorn (*Rhamnus cathartica*), and Tartarian Honeysuckle (*Lonicera tatarica*) from taking over the newly establishing native plants. Expenditures may be higher expenditures during the first three years for native plant maintenance and nuisance weed control as the native plantings become established. Costs for Operations and Maintenance shall be paid by the Owner, the Hobson Creek Community Council.

**Table 9. Site Maintenance Schedule.**

### **Post-Construction through 2012**

| <b>Activity</b>                     | <b>late March</b> | <b>mid-May</b> | <b>mid-June</b> | <b>mid-July</b> | <b>mid-August</b> |
|-------------------------------------|-------------------|----------------|-----------------|-----------------|-------------------|
| Mow and/or Cut Natives              | X                 |                |                 |                 |                   |
| Spot Herbicide / Remove Weeds       |                   | X              | X               |                 | X                 |
| Bioengineering Materials Inspection | X                 |                | X               |                 |                   |

### Responsibilities

The Hobson Creek Community Council Board and their designated Representative shall be responsible for project site maintenance. Participating parties will include the Owner's Representative, professional Contractor services support, or possibly volunteers of the Hobson Creek Community.

## Project Benefits

### Water Quality

Most of the Phase 1 streambank stabilization construction was completed by December 15, 2003. Final planting installations were completed by December 9, 2004. We observed rapid establishment of temporary cover crop following slope stabilization. Despite significant rainfall events in June 2004, the banks remained protected and erosion was greatly reduced. Selected replacement of invasive trees and shrubs with native species in the 1.61-acre riparian area will also substantially reduce the loss of bank soils and promote bank soils stability. Native riparian plantings will substantially not only reduce sheet erosion but also mass wasting within the region. This will significantly reduce non-point source pollutant loadings to the downstream East Branch DuPage River. Based on site observations, there is minimal sediment delivered to the stream from the restoration site.

The Illinois EPA Load Reduction Spreadsheet was used to calculate pollutant loading rates from the project site. Input data included a combined streambank (left and right bank) length of 1,379 linear feet (see Table 2). We included 794 linear feet of severe erosion with a bank height of 5 feet and an erosion rate of 0.55 ft/yr. We also included 585 linear feet of moderate streambank erosion with a bank height of 3 feet and an erosion rate of 0.40 ft/yr. Based on these assumptions, the project site had previously contributed approximately 115 tons of sediment, 115 pounds of phosphorus, and 231 pounds of nitrogen annually to Tributary # 6. These estimates do not include historic sediment loss due to severe channel downcutting which has also occurred at this site. Due to stream stabilization, these pollutant loading rates to Hobson Creek have been dramatically reduced at the project site.

### Habitat and Riparian Function

- Selected replacement of invasive species with native tree and shrub clusters, grasses, and forbs will protect and diversify wildlife habitat corridor along Hobson Creek, as well as diversity the native plant understory which is an indicator of a healthy ecosystem. The proposed plant species will also increase the diversity of foraging opportunities for wildlife. Significant amounts of dead woody debris in the riparian corridor were not removed, as this provides habitat for invertebrates, amphibians, birds, and mammals.
- Selected removal of invasive species will allow more desirable and beneficial species to flourish. There were numerous impacts to ecological integrity caused by the previously existing invasive plant species in the riparian zone. Dense stands of invasive shrubs such as common buckthorn and Tartarian honeysuckle previously shaded and out-competed growth of seedlings of black walnut (*Juglans nigra*) and bur oak (*Quercus macrocarpa*) which occur in limited number in the riparian area. Indeed, few seedlings of these desirable tree species were previously observed in the existing riparian area. Riparian restoration will increase sunlight penetration and increase the density of desirable tree and shrub species.

- The proposed riparian planting restoration will enhance the function of interception of rainfall. Deep-rooted trees and plants have increased absorption properties over the existing riparian species.
- The proposed density of trees, shrubs, forbs and grasses will enhance pollutant filtration and assimilation of nutrients as well as contaminated runoff discharged from surrounding upland areas, or through the project site. Native groundcover such as grasses and forbs are particularly efficient at trapping sediment in the uptake of phosphorus and nitrogen nutrients which otherwise cause pollution within the waterway. The proposed planting plan will significantly increase the abundance of groundcover species. Deep-rooted trees will increase the uptake of nitrogen from shallow groundwater, improving water quality of the stream.
- The proposed planting plan will help restore in-stream vegetative cover by encouraging partial sunlight penetration into the water column to enhance growth of shoreline forbs and grasses, as well as potentially allowing in-stream aquatic macrophytes. This will enhance the function of in-stream habitat conditions.

#### Public Outreach / Education

Project Signage (per project plans) placed at strategic locations at Green Trails Drive and at Green Briar Drive are being utilized to notify motorists, pedestrians, and visitors regarding the project, funding sources, and proposed improvements and activities. The project site adjoins a walking trail and outdoor athletic facilities at Seven Bridges Park owned by the Woodridge Park District that receives thousands of visitors annually. This park is located immediately downstream of Green Trails Drive. In addition, Caddy Corner Park is located adjacent to the upstream end of the project site, along the Hobson Creek corridor. Many of these park visitors use trails and sidewalks along the Hobson Creek stream corridor which will further enhance community educational outreach from the project site.

The Hobson Creek Community Council (HCCC) Board and members have been active over the last several years in acquiring Phase 1 Section 319 Clean Water Act grant funding through the Illinois EPA and U.S. EPA, acquiring DuPage County Water Quality Improvement Program funding, completing final engineering design, obtaining regulatory permit approvals for the Phase 1 and Phase 2 project areas, educating homeowners, acquiring landowner signoffs for the proposed work in the common area, setting aside matching funds to complete portions of this project, contracting with stream consultants, and other activities. Over 20 landowners along the project site have been contacted by HCCC regarding the project for easement agreements associated with the proposed work. Additional HCCC education includes Board meetings, quarterly newsletter updates, and announcements in meetings of the Conservation Foundation. According to Mr. Bob Longacre of HCCC, in part as a result of these efforts and a successful project, the residents of HCCC have been pleased with the project results to date.

Various newsletter, newspaper and periodical articles have been published regarding the Hobson Creek Corridor Restoration Project. The Conservation Foundation newsletter Watershed Currents published a project article in 2003, Vol. 2, Issue 2. Three newspaper articles have been published regarding the project. Meg Dedolph published "Homeowners Work to Restore Creek" in The Naperville Sun in mid-November, 2003. A letter to the editor of the Naperville Sun was published in response to the newspaper article was submitted by the Commissioner of the Forest Preserve District of DuPage County, entitled "Hobson Creek Restoration Lifts Quality of Life." One pre-construction newspaper article was published in the Daily Herald, Section 1. This newspaper article was entitled "Your Actions May Be Key to Water Quality, County Says." One professional publicist published three professional journal articles featuring the Hobson Creek Corridor Restoration Project. An article entitled "Hobson Creek Restoration Project" was published in the November / December 2004 Land & Water Magazine by Greg Northcutt including interviews with Ted Gray. An article entitled "Stable Streams" was published by Mr. Northcutt in December 2004 Civil Engineering News Magazine. November 2004. An article titled "Stabilizing an Urban Streambank" was published by Mr. Northcutt in the November, 2004 Landscape Architect and Specifier News.

## ATTACHMENT 1: PROJECT PHOTOS

**ATTACHMENT 2: PROJECT ARTICLES**

**A) LAND & WATER MAGAZINE SEPT./ OCT. 2004**

**B) WATERSHED CURRENTS (CONSERVATION FOUNDATION)**