

## Donaldson Run Stream Restoration – Tributary B Frequently Asked Questions (FAQs)

### ***Stream Restoration Overview***

**What is stream restoration?** Put simply, stream restoration creates a stream that is in balance with stormwater flows from its watershed. The result is a stable, self-maintaining stream channel that can dissipate energy along its flow path and balance the processes of erosion and sediment deposition.

#### **Why do a stream restoration project? Why not just leave the stream as it is?**

Donaldson Run has been impacted by stormwater runoff, causing excessive erosion along the stream channel. There are several compelling reasons to do a stream restoration, sooner rather than later:

- **Reduce sediment pollution.** Sediment that erodes from the banks of Donaldson Run degrades the water quality in the stream also pollutes the Potomac River and the Chesapeake Bay. Sediment, and the nutrients carried with it, are pollutants that reduce dissolved oxygen, block sunlight from water, and smother aquatic life. For these reasons, the U.S. Environmental Protection Agency's Chesapeake Bay Program has recognized urban stream restoration as a key component of the plan to restore the Chesapeake Bay watershed.
- **Improve stream health.** By creating a stable stream channel, the habitat for aquatic organisms will be greatly enhanced.
- **Protect the sanitary sewer line.** The stream erosion has uncovered the sanitary sewer line in several places, making it more susceptible to breaks and sewage leaks. This sewer line was originally buried about three feet below the stream channel bottom, but the stream has eroded down several feet over the past 50 years.
- **Improve the long-term health of the stream valley forest.** The stream erosion continues to undermine trees along the stream bank, and a substantial number of mature trees have fallen into the stream or across the trail in recent years. Many of the trees that will be removed by the restoration project are trees that are already undermined by existing stream erosion and are likely to fall or die. The restored stream channel will be stable, and, as a result, the remaining trees and new trees planted after restoration will be protected.
- **Restore native vegetation** to the Tributary B stream valley. The area surrounding Tributary B is overrun with invasive, non-native plants such as kudzu, porcelainberry, and English ivy. These plants choke out native vegetation, and do not support local wildlife. Climbing invasive vines such as English ivy can kill trees as well.
- **Protect the bike trail.** Erosion is threatening the trail through the park in several places.

#### **Q. Why aren't more money and resources being devoted to addressing the problem of storm water runoff at the source? Wouldn't the long-run cost be less and the resolution better?**

A. Stream restoration and [watershed retrofits](#) are both needed to protect our local and regional water resources. Watershed retrofits are storm water management facilities added closed to the source to slow down and treat storm water runoff. Watershed retrofits help water quality in our streams in the long term, but **cannot undo the damage that development and excessive runoff have already caused to local streams**. Streams that have eroded down and widened in their channel will continue to do so, washing more sediment and pollution downstream, and threatening more trees along the stream channel. In addition, the highly urban nature of our County means there is limited space for new stormwater management facilities.

Stream restoration and watershed retrofits are both costly, particularly in urban communities like Arlington County. For FY 2011-2016, Arlington County's proposed Capital Improvement Program for the Stormwater Fund contains slightly more funding for watershed retrofit (\$1.85 million) than for stream restoration (\$1.75 million) projects. This latter number does not include funding for restoration of Donaldson Run Tributary B, which has been committed since 2007, prior to the establishment of the

Stormwater Fund. Funding for Tributary B also includes \$350,000 from the Neighborhood Conservation Program.

**Q. What are the annual costs to maintain the restored areas? How much have the repairs cost?**

A. Approximately \$30,000 has been spent to date on invasive plant control and additional planting of native species along the restored portions of Tributary A. The damage caused by the severe June 2006 storm event, which occurred only two months after construction, was due to two key causes: 1) the severity of the event prior to the establishment of planted vegetation; and, 2) significant construction errors by the contractor. The contractor assumed approximately half of the repair costs; the County paid approximately \$170,000 for the repair work. The County has established more stringent quality control procedures for subsequent stream restoration construction work.

**Q. Most of the year the stream has very low flow, so why do we need a large, expensive project that reshapes the entire area to deal with a few episodes?**

A. Flows during storms are the flows that shape and impact stream channels the most, and the ones that must be addressed in managing and restoring urban streams. During times of high flow in natural streams, water spills over the banks onto a floodplain area. This area exists in all natural stream and river systems. The floodplain slows the stream's flow during storms, deposits nutrients for the streamside forest, protects in-stream habitat and prevents erosion of the stream banks and channel.

Currently, Tributary B cannot overflow its banks onto a floodplain, even during very severe storms. Instead, these flows are trapped within the stream's banks. The energy from these high flows has scoured the stream bottom and banks, causing erosion and pollution downstream, damaging trees, sewer lines, and trails, and destroying habitat for fish, amphibians and invertebrates that live in the stream.

The stream restoration will incorporate several design features to restore a floodplain connection and control stream energy during storm events.

**Q. The small pools built in the previous stages create stagnant pools during the dry months of the year, creating significant breeding ground for mosquitoes. Shouldn't that side-effect be considered in the restoration plan? This is a health risk (including West Nile virus) and directly counter to advice the County gives to residents regarding practices on their own property.**

A. A goal of stream restoration projects is to create habitat within the stream channel. This often results in the creation of pools, which are refuges for many fish and invertebrates. Although the stream water in the pools looks calm and stagnant, the water is still flowing slowly through the pools. Mosquitoes need about 7 days in completely stagnant water to complete their life cycle, so the water flowing through the stream should not add more mosquito habitat than existed prior to restoration. Biological sampling conducted in portions of the previously restored Tributary A over the past several years has not found mosquito larvae present except on isolated occasions. As the ecosystem improves after the restoration, mosquito predators including amphibians, birds, fish, other insects, and bats also become more prevalent.

Mosquitoes are one of the hazards of visiting or living near natural areas – among the pros and the cons, many would place them at the top of the con list! Unfortunately, Arlington residents are equally if not more at risk from West Nile virus from the now dominant Asian Tiger mosquitoes that breed in small pools of water in gutters, tires, tarps, flower pots, and similar small containers in their own yards than from mosquitoes in restored or unrestored stream valley systems. The Asian Tiger mosquitoes are active all day long and, because residents spend the most amount of time on their own properties, the risks of contracting West Nile virus from a mosquito are greatest at home than anywhere else.

**Q. Is the use of 'stream restoration' still in its experimental phase, an acceptable way to re-engineer a natural environment? Isn't Donaldson Run a unique natural environment already?**

A. The open space preserved within Zachary Taylor Park offers a refuge for wildlife and provides recreation opportunities for the surrounding community. Both the stream and its valley are an asset to Arlington County and its residents. However, Tributary B, like Tributary A prior to restoration, has been ravaged by stormwater flows and the stream and its valley forest have deteriorated due to land use and drainage decisions made in the watershed over a period of more than 50 years. Tributary B is not a healthy, natural stream. Erosion in Tributary B is contributing to sediment and nutrient pollution locally and in downstream waters including the Potomac and the Chesapeake Bay and undermining trees, damaging infrastructure and impacting native vegetation and wildlife in Zachary Taylor Park.

The practice of stream restoration is beyond the experimental phase and has been recognized at the State and Federal level as a critical component of a comprehensive urban watershed management program. See:

[http://www.nrcs.usda.gov/technical/stream\\_restoration/](http://www.nrcs.usda.gov/technical/stream_restoration/)

<http://www.fws.gov/ChesapeakeBay/stream.html>

[http://www.dcr.virginia.gov/soil\\_and\\_water/documents/streamguide.pdf](http://www.dcr.virginia.gov/soil_and_water/documents/streamguide.pdf)

The Tributary A stream restoration project has achieved its key design objectives, including dramatically reducing stream bank and bed erosion, improving stream habitat, protecting trail and sewer infrastructure, and improving stream access and recreation as well as education and interpretation opportunities. Lessons learned from the Tributary A project include needs for: more stringent construction oversight, better tree protection, more robust planting, and invasive plant control. Based upon design benchmarks, however, the Tributary A project is considered a major success story.

More broadly, the Donaldson Run stream restoration work is a model of County government and local neighborhood collaboration and cooperation, with extensive community outreach efforts. Stream restoration efforts along Donaldson Run have received local, regional, and broader attention. In June 2009, Virginia Tech, through its Department of Forestry, sponsored a stream restoration conference in Arlington that focused on Donaldson Run.

## ***Project Background***

**How did this project get started?** Over 10 years ago, residents in the Donaldson Run neighborhood were concerned about erosion in the stream, which degrades water quality and in-stream habitat, and threatens nearby trees and trails. DRCA applied for Neighborhood Conservation Funding (NCP) in 2001 to study Donaldson Run and identify potential stream improvements. A stream restoration project on Tributary A was completed in 2006. Additional NCP funding was requested for Tributary B in 2004.

**Who is working on this project?** The project team is composed of County staff from Department of Environmental Services, the Department of Parks, Recreation and Community Resources, and the consultant team. An **advisory group** has been formed to advise the project team. This advisory group includes representatives from the civic association, and one representative from each of the Urban Forestry Commission, the Parks and Recreation Commission, the Environment and Energy Conservation Commission, and Arlingtonians for a Clean Environment.

**Prior to using stream restoration techniques, the County would install large rocks or concrete along stream banks, but that didn't fix the erosion problems. How is a stream restoration project different?** This project is different from the previous attempts to stabilize the stream. It involves careful study and analysis of the stream channel and watershed prior to doing any work. By better understanding the stream and the amount of water flowing in it, modern techniques lead to design of a stable channel shape that will be self-maintaining. The new design of the stream channel will allow the stream to dissipate energy along its flow path, without eroding the channel or negatively impacting downstream areas, so the stream channel will maintain its shape.

## ***Public Process***

**When did the Tributary B project start?** The public planning and design process for the project began in 2004 with an announcement in the [Donaldson Run Civic Association newsletter](#) that a vote would be taken at the September DRCA general meeting to designate the Tributary B project as DRCA's #1 Neighborhood Conservation Program project. A unanimous vote in support of the project occurred at the September 2004 meeting. Votes were also taken at two DRCA meetings during 2005 to reaffirm the Tributary B stream restoration project as the neighborhood's first priority NC project.

The [Neighborhood Conservation Advisory Committee](#) approved \$350,000 for the Tributary B stream restoration project in December 2007. Matching funds to construct the project will come from the County's Stormwater Fund.

More than a dozen civic association newsletters have provided updates on the project since 2004, and separately, the project has been discussed by DRCA leadership and/or staff at more than a dozen civic association meetings since 2004.

A **citizen advisory group** has been formed to advise the project team. This advisory group included several representatives from the civic association, and one representative from each of the Urban Forestry Commission, the Parks and Recreation Commission, the Environment and Energy Conservation Commission, and Arlingtonians for a Clean Environment.

The anticipated schedule moving forward is as follows:

### **60% Design**

- DRCA/community meeting, June 2010
- Stakeholder Advisory Group meeting, July 20
- Second Streamwalk, Summer 2010

### **100% Design**

- Stakeholder Advisory Group meeting, September 2010
- DRCA/community meeting, September/October 2010

### **Construction**

Fall 2010/Winter 2011; if schedule runs longer, state/federal environmental permits prohibit construction from February through May, so construction may not start until Summer 2011.

## ***Project Logistics***

### **How will the project impact neighbors and users of the park (noise, access, etc)?**

Construction equipment will be used in the stream restoration project, to reshape the stream channel, install sanitary sewer lines, and move heavy items, such as rocks. County staff will work with the community to minimize disturbance as much as possible. One advisory group member pointed out that that remodeling a house is a good metaphor for a stream restoration project: There is some disturbance and mess while the remodeling takes places, but the end goal should be a drastic improvement that is worthy of the disturbance.

### **What type of equipment will be used for the project?**

Some heavy equipment, such as backhoes, will have to be used in restoring the stream channel. Disturbance to neighbors will be minimized as much as possible, and great efforts will be made to protect trees and plants from damage from the equipment. This will be done, in part, by choosing a contractor with experience operating in wooded park environments such as those along Donaldson Run.

**Q. To what extent do the storm and sanitary sewer pipes need to be replaced and what impact will that have on the project? Who pays for that part?**

A. A short section of the storm sewer pipe between N. Upton St and the upstream outfall for Donaldson Run Tributary B has been damaged by stormwater flows and will be replaced. In addition, the endwall for the storm sewer pipe that drains N. Upshur St will be replaced or repaired.

Replacement of public sanitary sewer pipe is not anticipated. Several public sanitary sewer pipes and one private sanitary sewer lateral have been exposed as the stream has eroded over the past 50 years. The restoration will raise the elevation of the stream, burying these pipes. This will protect them from breaking and releasing untreated sewage into the stream (as has happened in the past in both the Tributary A and B stream valleys).

Repairs to the storm sewer system and protection of the sanitary sewer pipes have been included in the Donaldson Run Tributary B restoration project budget and will be paid for with the combined funding for the project from the Neighborhood Conservation Program and the Stormwater Fund.

**Q. What about the Chesapeake Bay Preservation Ordinance that limits development and tree removal along Arlington County streams? Does the County have to abide by these regulations?**

A. The Department of Chesapeake Bay Local Assistance (DCBLA), the State agency that oversees the implementation of the Chesapeake Bay Preservation Act and Regulations, recognizes the benefits of comprehensive stream restoration and has issued guidance (excerpted below) that establishes stream restoration projects as 'permitted development' activities under State law and regulation and Arlington County's Chesapeake Bay Preservation Ordinance.

*Water Dependent Facilities*

*Certain uses are permitted by-right within the RPA. Water dependent facilities, i.e., facilities that by their very nature require that they be located adjacent to the water, are among these facilities. Some examples of water dependent facilities that are permitted to be located within the RPA include the water dependent portion of marinas, aquacultural facilities that require fresh flows of water, beaches, docks and piers as well as stream and wetland restoration projects that have been permitted by state and federal agencies such as DEQ and USCOE.*

As explained in the State guidance excerpted above, stream restoration projects must obtain all other required environmental permits to work in waterways.

## **Trees/Plants**

**Will a tree inventory be conducted as part of the project?** Yes, the trees near the stream have been inventoried and measured. The proposed stream channel will be adjusted as much as possible to protect mature trees, without compromising the design.

**How are the trees going to be replaced?** Some trees along the stream channel will have to be removed in the course of re-configuring the stream channel. However, many of the trees that are close to the stream banks are already endangered due to the stream erosion. Many more native trees and plants will be planted following the restoration project than will be removed.

**What types of plants will be used in re-vegetating the stream banks after the project?** The stream valley is mostly shaded, and shade-tolerant native species of grasses, shrubs, and trees will be used. Currently, there are extensive invasive, non-native plants throughout the stream valley, so the addition of more native plants will improve the habitat for wildlife.

**Q: Why are you planting small trees (seedlings) instead of larger ball-and-burlap trees? Won't they take a long time to grow?**

A; The survival rate for smaller trees is much higher than for larger trees. The Virginia Department of Forestry recommends planting seedlings for reforestation for these reasons:

- Ball-and-burlap trees must be watered for the first year or so to ensure survival. This is challenging in a park setting.
- Ball-and-burlap trees spend the first few years regrowing root mass that was removed when they were transplanted. Seedlings are transplanted with their entire root system intact and can spend all their energy on growth, so they typically catch up with their ball-and-burlap counterparts in height and diameter in several years.
- Seedlings send out more roots quickly than the ball-and-burlap trees. The roots interweave with each other along the stream bank, contributing to the bank stability sooner than the ball-and-burlap trees.

**Q. What herbicides are being used to maintain prior stream restoration projects?**

A. Herbicides containing glyphosate and triclopyr have been used in Zachary Taylor Park and Lee Heights Park to limit populations of invasive plants along restored sections of Donaldson Run. When applied properly, these herbicides are among the least toxic available for application near aquatic resources.

**Q. How can small trees and new vegetation absorb as much water as the existing large trees and thick vegetation? The planting from previous phases do not seem to have grown much.**

A. New, small trees do not absorb as much water as larger established trees. However, in the long term, the restoration should create a healthier, more diverse streamside forest that will not only absorb surface runoff, but also provide many additional benefits for water quality and wildlife.

Stream erosion along Tributary B has undermined many of the existing large trees as the stream has deepened and widened its channel. As a result, a substantial number of mature trees have fallen into the stream or across the trail in recent years. In addition, non-native, invasive plants make up the majority of the thick vegetation growing along Tributary B. Invasive vines such as English ivy, Chinese wisteria and Japanese wisteria damage streamside trees by overtopping, shading, and girdling them, or by introducing disease-causing pathogens. Many of the trees that will be removed by the stream restoration project are currently undermined by erosion or overtaken by invasive plants and may not have survived much longer in any case.

Removal of healthy, existing trees is avoided if at all possible, but is sometimes necessary for stream restoration. When trees must be removed, they are typically replaced with several young trees of various species. This increases the diversity of the streamside forest. Maintenance of the restored area prevents re-establishment of invasive plants. The restored stream channel will also be stable, limiting erosion and protecting remaining trees and new seedlings alike.

**Project web site:**

[Tributary B Stream Restoration Project web site](#)

<http://www.arlingtonva.us/departments/EnvironmentalServices/epo/page75482.aspx>

For more information, please contact Larry Finch of the Donaldson Run Civic Association at [lefinch@verizon.net](mailto:lefinch@verizon.net) or 703-528-6349 or Aileen Winqvist with Arlington County at [awinqvist@arlingtonva.us](mailto:awinqvist@arlingtonva.us) or 703-228-3610.