

## **Evaluation and Recommendations**

Monitoring efforts in the Special Protection Areas continue to provide the kind of information needed to comprehensively analyze stream conditions and BMP performance as development proceeds. Stream conditions have, for the most part, remained in the 'good' range since the beginning of the program in 1994. Piney Branch is an exception, as monitoring results show the biological community, particularly the benthic macroinvertebrates, is highly variable from year to year, ranging from 'poor' to 'good'.

Impacts to the biological community residing in streams flowing through the SPA's are from both natural and man-made causes. The record drought that hit the region during 2002 greatly reduced stream flow in the SPA's and portions along Ten Mile Creek mainstem went completely dry. In 1999 the region experienced a drought not quite as severe but that did also have an impact on stream biology. The result was reduced density of stream inhabitants. However, bio-diversity remained intact. In other words, the number of individuals declined, but the number of species remained the same after the drought. Data from fish monitoring in 2002 indicate a similar response to the drought of 2002. Results from biological monitoring in 2003 will help determine the level of impact from the drought. Additionally, land disturbance associated with new development continues to be a potential threat to streams as more acreage begins to develop in the SPA's, particularly in Clarksburg. DEP is working closely with DPS sediment inspectors to monitor, detect and correct problems with sediment control before large scale damage occurs in streams.

Although, land disturbances in Clarksburg have not impacted the stream biota, greater amounts of fine sediments have been observed downstream of the new Clarksburg town center construction. This is cause for concern in light of the land disturbance that will occur in the near future. Effective sediment control is critical to protecting the stream eco-system. In late 2002 DPS began requiring the use of flocculants in sediment basins on some SPA projects to minimize sediment impacts. This requirement is usually made on larger basins or where it is perceived that extra protection is needed. Flocculants are designed to increase the amount of solids that settle out of water in sediment ponds.

Biological monitoring results from Piney Branch are the most variable of all three SPA's. IBI scores fluctuate widely from year to year which is indicative of instability. Variability is likely due to man-made stressors related to the high density development within the headwater areas. DEP has observed increased algae growth in Piney Branch which is believed to be caused by increased nutrient input to the stream. Although, nutrient monitoring conducted throughout the watershed revealed no 'hot spots', results from BMP monitoring on one development project have shown a steady increase in groundwater nutrients. It is possible that nutrient input to Piney Branch has increased but that detection is not possible as the nutrients are quickly taken up by algae growing in the stream. Algae growth causes dissolved oxygen (DO) levels in the stream to fluctuate between day and night. DEP has documented DO reaching stressful levels during the night in Piney Branch. Therefore, what has been determined is that low DO is a significant stressor and that algae growth is the most likely cause. What has not been

determined is the cause of increased algae growth and how to address the problem. Because of this experience, DEP has requested nutrient monitoring of groundwater on development projects in Clarksburg that are now in the review process.

Most of the BMP monitoring results from completed projects, thus far, evaluate how well overall site designs have functioned in meeting performance goals established for each site. For example, several projects have been completed where BMP monitoring has determined whether or not the site has had an impact on stream temperature, stream sedimentation or groundwater elevation. However, much more limited data has been collected on how individual BMP structures are meeting performance goals and reducing pollutant loads to streams. Several projects are coming along, either in the review stage or early construction stage that are going to monitor performance of individual BMP's for pollutant removal. DEP has received some results on removal efficiency of Total Suspended Solids (TSS) from stormwater runoff as it passes through sediment control facilities. DEP has made improvements to the methodology used in conducting this kind of monitoring and anticipates receiving more data on individual BMP performance in the near future.

DEP is continuing to work closely with DPS, project developers and monitoring consultants to improve the timeliness and quality of required BMP monitoring submissions. DEP also had concerns about tracking and reporting BMP monitoring results. Over the past year DEP has been working closely with consultants doing the monitoring to address this concern. Progress has been made on improving monitoring reports submitted by consultants which will make it easier to track BMP monitoring status and to report findings.

## **Appendix 1: Explanation of the Special Protection Area Program**

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### **App. 1.1 Purpose of Special Protection Areas**

Article V of the Montgomery County Code defines Special Protection Areas (SPA's) as geographic areas which may be designated by the County Council where: "...1) existing water resources or other environmental features directly relating to those water resources are of high quality or unusually sensitive; and 2) proposed land uses would threaten the quality or preservation of those resources or features in the absence of special water quality protection measures which are closely coordinated with appropriate land use controls...."

SPA program purposes specified in Article V are to:

- 1) establish coordinated procedures, performance goals, criteria, and requirements for development in SPA's that will mitigate adverse impacts on water resources during and after construction or other land disturbing activities; and,*
- 2) provide a focused, coordinated approach for water quality protection and monitoring in SPA's.*

### **App. 1.2 Designated Special Protection Areas**

To date, the County Council has designated three areas within the County as high quality stream systems which are in need of measures beyond current standards to assure that they are protected to the greatest extent possible from the impact of master planned development activities (Figure 1). In chronological order of their designation these SPA's are: the Clarksburg Master Plan SPA; the Upper Paint Branch Watershed SPA; and the Piney Branch Watershed SPA. Once Special Protection Areas are designated all subsequently approved plans for development, except for those with a valid record plat recorded prior to October 31, 1994, are required to comply with Executive Regulation 29-95, Water Quality Review for Development in Designated Special Protection Areas.

### **App. 1.3 Water Quality Plan Review Process**

The SPA program requires the Montgomery County agencies and M-NCPPC to work closely with project developers to pro-actively address possible impacts to the existing stream conditions and to guide the development of related concept plans for site layout, environmental buffers, forest conservation, site imperviousness, stormwater management, and sediment control earlier in the regulatory review process. Outside of SPA's, County and M-NCPPC staffs generally are able to review a project only *after* a plan is formally submitted by an applicant showing a proposed site's conceptual layout and stormwater management designs. This review typically occurs for the preliminary plan of subdivision. (Review of a proposed project's conformance to environmental protection requirements and guidelines may also occur with a site plan, special exception application, mandatory referral, or zoning application). This sequencing of plan review requires a reactive response by County

and M-NCPPC staffs to approve projects in the development review process. This often necessitates major modifications to development plans when County staff or M-NCPPC staff find that environmental protection measures proposed by the applicant are inadequate.

Within SPA's, County and M-NCPPC staffs are now able to convey environmental protection goals, objectives, and concerns to the applicant of a proposed development project *before* the applicant designs the initial site layout concept for the project. The SPA program is designed to put the environmental issues up front in planning for land development within the SPA's. This proactive approach reduces the potential for negative environmental impacts by requiring the County and the M-NCPPC to provide detailed environmental information and guidance on enhanced protection measures to the applicant prior to the concept plan design stage and before the formal development review process begins. Applicants are then able to design projects which take into account current available information on stream conditions, forest conditions, types of soils, site topography, and other environmental features, to address identified environmental constraints, and to incorporate enhanced BMP's before concept plans are submitted.

Under the SPA program, most applications for new development projects in SPA's are required to submit water quality plans which will provide a more comprehensive package of information to the County than is required as part of the more typical (i.e., non-SPA) development review process.

In addition to evaluating the stream conditions, the SPA review process includes site visits, analysis of subwatershed environmental characteristics, investigation of existing environmental problems, avoidance and/or minimization of the long term impacts of the development, and implementation of BMP monitoring plans.

#### **App. 1.4      Public Input**

A water quality plan is a document submitted by a permit applicant that demonstrates how a new development project within a SPA proposes to meet certain site-specific, watershed protection goals. It is required for most development projects within SPA's. Typically, permit applicants must prepare both a preliminary and a final water quality plan.

After submission of a preliminary water quality plan, a SPA public information meeting will be held if requested in accordance with Executive Regulation 29-95. At these meetings developers present technical and site design information and methods to the public which show how the water quality plan will meet the performance goals for the SPA as specified in the SPA Conservation Plan. These meetings produce useful dialogue between the public, the County, M-NCPPC, and project developers regarding site design, environmental sensitivity, and BMP selection.

After considering input obtained at an informal public information meeting, the DPS, in coordination with

DEP, acts on those aspects of the water quality plan in which the two agencies have lead agency responsibility (see Appendix 1.5 below for summary of lead agency responsibility in water quality plan review). In addition, the Planning Board holds a public hearing for a water quality plan, as either part of, or in conjunction with a public hearing for the proposed development project itself. The Planning Board is required to review and act on those aspects of the water quality plan in which the M-NCPPC has lead agency responsibility (see also Appendix 1.5 below).

#### **App. 1.5 Agency Review and Approval of Water Quality Plans**

The SPA law requires that water quality plans for a project be approved by DPS, in coordination with DEP, and the Planning Board before the project can proceed. Each agency has lead role responsibility for different components of a water quality plan. M-NCPPC has lead agency responsibility for site imperviousness requirements and environmental guidelines, environmental buffers, and forest conservation. Lead agency responsibility for DPS covers stormwater management controls, sediment and erosion controls. DEP has lead agency responsibility for carrying out and reporting results from the SPA stream monitoring program, performance monitoring for best management practices and for preparing SPA conservation plans.

## Appendix 2: Glossary of Terms

**BMP** - Acronym for 'Best Management Practice', refers to either a structure or practice that is designed to either improve water quality or reduce the impact that storm water runoff imparts on the receiving stream. Examples include but are not limited to: 1) storm water retention ponds - purpose is to collect, hold and release storm water runoff at a reduced rate, 2) bioretention areas - an area of densely planted wetland plants that act to uptake nutrients from stormwater runoff, 3) infiltration trench - purpose is to get as much storm water runoff into the ground as possible thus reducing the volume of runoff and recharging groundwater which is important in maintaining baseflow in a nearby stream.

**IBI** - Acronym for 'Index of Biological Integrity' - the IBI is simply a method of comparing the biological community found in any stream to that found in reference streams. Reference streams are the "least impaired" streams within the Montgomery County region. By measuring how closely a stream compares to the reference condition, a relative assessment can be made of resource condition. The IBI rates the resource condition as excellent, good, fair, or poor. An excellent rating is equivalent or comparable to the reference condition, while a poor rating indicates a condition having little or no similarity to the reference condition. DEP has developed an interim IBI for both fish and benthic macroinvertebrates that is specific to the Montgomery County region.

**Benthic Macroinvertebrates** - Small creatures that spend at least part of their lives in or on the stream bottom. The name 'benthic macroinvertebrate' derives from the fact that they are bottom dwelling (benthic), large enough to see with the naked eye (macro), and without backbones (invertebrates). Benthic macroinvertebrates include not only insects but also crustaceans (crayfish), oligochaetes (worms) and mollusks (freshwater clams, snails).

**Embeddedness** - Refers to the extent to which rocks (gravel, cobble or boulders) are covered or sunken into the silt, sand or mud on the stream bottom. This is an important assessment in that many stream inhabitants occupy the spaces in between the rocks on the stream bottom. Thus, as embeddedness increases there are fewer spaces in between the rocks as this space is filled with sediment and therefore fewer stream inhabitants.

**Riffle** - That portion of a stream where water flows fast and shallow over rocky substrate. This area of a stream is where a majority of the benthic macroinvertebrates live along with several species of fish.