Anacostia Stream Trash Surveying Methodology and Indexing System

Prepared for:
Anacostia Trash Workgroup

Prepared by:
John Galli and Kathy Corish
Department of Environmental Programs
Metropolitan Washington Council of Governments

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I. Introduction

Trash is defined as discarded material or refuse. Often this refuse is improperly, carelessly or intentionally disposed of and therefore ends up along roadsides, in public and private open space and in streams. Concerned with the large volume of trash in the tidal Anacostia River and many of its tributaries, the Anacostia Watershed Restoration Committee (AWRC) established an ad-hoc workgroup to conduct an initial assessment of the Anacostia River's trash problem and advised the AWRC on strategies for its reduction and prevention. The 1996 *Summary Report on Anacostia Trash* produced by the workgroup found that despite the many individual trash collection and prevention programs throughout the watershed, trash is still a significant and pervasive problem. In response, the AWRC in December, 1996 established the Anacostia Trash Workgroup as a permanent workgroup with the hope of building partnerships among the various individual programs to more effectively combat the trash problem throughout the watershed. As a first step, the AWRC directed the Anacostia Trash Workgroup to conduct a comprehensive trash survey of the watershed.

Before developing the Stream Trash Surveying Methodology and Indexing System, COG staff conducted a search for: 1) existing stream trash surveys or surveying methodologies, 2) indexing systems that characterize the severity of stream trash problems and 3) a system of indicators to trace sources of stream trash. While there is much information regarding existing surveys of and surveying methodologies for marine debris and land-based litter, very little information could be found on surveying methodologies and indexing systems for trash in streams. Search efforts included an internet search and phone conversations with several leaders in the field of litter surveying methodologies (Hurld, 1998; Jones, 1998; Schert, 1998; Syrek, 1998).

II. Anacostia Tributary Trash Surveying Methodology

Borrowing from some of the techniques used to survey land-based litter (Syrek, 1986) and from their many years of experience in local stream surveying, COG staff set out to develop a simple, low-cost stream trash surveying methodology that could be performed quickly and easily by citizen volunteers with minimal training or guidance.

Stream reaches to be surveyed generally include known lengths ranging from 500 feet to approximately one mile, depending on the location of well-defined road crossings or other landmarks. Reaches must be long enough to provide an accurate characterization of the number of items observed on a per 100-foot basis, but also be of a length that can be walked within a one-half to two hour period. Stream lengths can be calculated using a map wheel and 200-foot scale topographic maps, or obtained through local resource agencies such as COG. While the following methodology can be quite satisfactorily performed by one surveyor, it is generally recommended that a team of two surveyors walk a survey reach. This is especially important for large mainstem areas which are more than 50 to 60 feet wide. Additionally, a two-person team is typically safer.

A. Pre-Survey Considerations and Preparation

Seasonal factors and rainfall/stream discharge conditions can significantly affect trash generation and accumulation rates (Syrek, 1986); therefore, a given stream reach should be surveyed at approximately the same time each year. Note, stream access and surveying will typically be easier during late winter and early spring due to a reduction in vegetation along streambanks. Surveying should be conducted on dry days and at least two to three days after the last significant storm event so that the stream is running clear and trash items within the stream and its channel are clearly visible. Furthermore, every attempt should be made to organize volunteer teams so that all survey sites within a sub-basin are surveyed during approximately the same time period (i.e., preferably within the same one to four week period).

B. Equipment

Essential equipment for trash surveyors include the following:

- water-resistant or water-proof boots, or hip-waders if available,[1]
- hand-held tally counter,
- Anacostia Tributary Trash Survey form,
- clip board,
- mechanical pencil.[2]

As an option, a large-scale, planning-level topographic map (1 in. = 200 ft.) may be used to highlight conditions and measure distances. Finally, if available, a camera equipped with color slide film provides excellent photo-documentation of representative conditions and/or notable areas observed while surveying.

C. Surveying Procedures and Counting Guidelines

As COG staff discovered during their pilot survey of Sligo Creek, the best vantage point for observing and counting trash is generally within the stream channel. However, due to varying and unpredictable water depths along even a short stretch of stream, this option is only possible if hip-waders are available. The second best option is to employ two surveyors, one on each stream bank. The third and final option requires the lone surveyor to record while walking along one side of the stream channel.

Using a hand-held tally counter, the surveyor(s) walks within the stream channel or along the stream bank counting each trash item that is bottle cap size or larger (i.e., approximately one inch diameter or larger). Surveyors should count only those trash items observed within the bankfull channel (i.e.,

[1] Hip-waders allow the surveyor to walk within the stream channel rather than up along the stream bank. COG staff found that significantly more trash can be observed from the stream channel.

[2] In generally, a pencil operates better than a pen during cold weather and generally will not bleed on clothing. A mechanical pencil does not require sharpening.

everything from top-of-bank to top-of-bank including items visible within the stream itself). As a general rule, surveyors should not count very small trash items (i.e., items smaller than a bottle cap, such as cigarette butts, styrofoam packaging chips or bits of paper) unless several are observed.

If two surveyors are walking within the stream channel each should count only those trash items from the middle of the stream channel to his or her respective bank. If two surveyors are walking along opposite banks, one person should count both the trash items observed along his or her stream bank and those within the stream itself, while the other should count only those items on his or her bank. Finally, if only one surveyor is available and cannot survey within the stream channel, he or she should be aware that many trash items along the opposite bank could be hidden from view. To avoid overlooking these trash items, the surveyor should stop intermittently at points that offer a clear view of the opposite bank. Items of special interest and concern (e.g., oil quart containers, tires, etc.) should be tallied during the survey.

Once the stream reach has been surveyed, the surveyor(s) should complete the trash survey form (Table 1) by noting the total number of trash items counted, the different categories of trash items observed, and the three categories of greatest abundance. When possible, noteworthy areas should be photo-documented.

III. Stream Trash Indexing System

In an effort to standardize the reporting of trash levels observed along Anacostia tributaries, COG staff developed a simple, relative trash indexing system. COG's Stream Trash Indexing System uses a verbal ranking to characterize the number of trash items observed per 100 feet of stream surveyed. The system ranks the level of trash as follows:

No. Items/100 ft.	Verbal Ranking
0 - 10.0	None - Very Light
10.1 - 25.0	Light
25.1 - 50.0	Moderate
$\geq$ 50.1	High

COG staff developed this indexing system during its pilot trash survey of Sligo Creek watershed. A total of twenty survey reaches within the Sligo Creek watershed, distributed along its mainstem and major tributaries, were surveyed. In addition, reference streams assumed to have low trash levels based on low population densities and low development levels within their drainage areas were selected and surveyed to provide baseline trash levels for a clean stream. The surveyed reference streams include: Mary Bird Branch (a tributary of South Fork Quantico Creek in Prince William Forest Park, Prince William County, Virginia), the Talbot Farm Tributary (a tributary to South Fork Catoctin Creek, Loudoun County, Virginia) and sections of Upper Paint Branch (Montgomery County, Maryland).

Cited and General References

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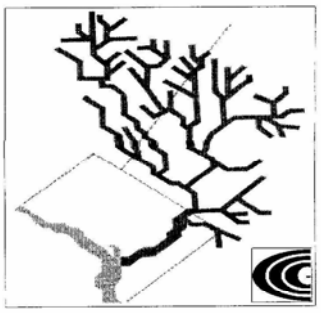
Anacostia Tributary Trash Survey



Date : _____

Investigator(s) : _____

_____

_____

Subwatershed : _____

Stream Reach : _____

Survey Length (ft) : _____

Total No. of Observed Items : _____

No. of Items per 100 ft : _____

Top Three Items : [ ] [ ] [ ]

Items (check box if present ; provide actual count for parenthesized items)

- [ ] 1. Plastic Bags
- [ ] 2. Plastic Bottles
- [ ] 3. Glass
- [ ] 4. Aluminum Cans
- [ ] 5. Styrofoam cups, etc.
- [ ] 6. Paper, Cardboard, Cloth
- [ ] 7. Auto :
  - [ ] Oil Quart Containers (_____)
  - [ ] Oil Filters (_____)
  - [ ] Air Filters (_____)
  - [ ] Antifreeze Containers (_____)
- [ ] 8. Car Batteries (_____)
- [ ] 9. Car Tires (_____)
- [ ] 10. Auto Body Parts
- [ ] 11. Construction Debris :
  - [ ] Bricks
  - [ ] Concrete
  - [ ] Drywall
  - [ ] Lumber
- [ ] 12. Appliance(s)

_____

_____

- [ ] 13. Wooden Pallets (_____)
- [ ] 14. Metal :
  - [ ] Drums (_____)
  - [ ] Cans
  - [ ] Etc.
- [ ] 15. Miscellaneous

_____

_____

Photograph (Number and Description):

_____

_____

Notes :

_____

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