

MANAGING DEBRIS In The Susquehanna River Watershed

"The signatory states agree that dumping or littering upon or in the waters of the Susquehanna River Basin or its tributaries or upon the frozen surfaces thereof any rubbish, trash, litter, debris, abandoned properties, waste material, or offensive matter, is prohibited and that the law enforcement officials of each state enforce this prohibition."

--Section 6.8 of the Susquehanna River Basin Compact

Where does debris in the Susquehanna River and its tributaries come from?

The Susquehanna River Basin—covering portions of New York, Pennsylvania and Maryland—is comprised of 67 percent forest lands and contains nearly 40,000 miles of rivers and streams. Debris in the Susquehanna River and its many tributaries comes from both natural and man made sources. The vast majority, however, comes from natural sources.

Natural Debris: As part of a natural cycle, branches from streamside trees and vegetation (sometime whole trees and shrubs) fall into the streams or onto stream banks and flood plains. The fallen, natural material often is carried downstream during high flow events. A significant percentage of the natural debris comes from the more heavily-forested upper reaches of the Susquehanna basin, where the Susquehanna River and its tributaries meander, creating conditions for streamside trees and brush to fall into the waterways.

Man Made Debris: In addition to natural materials, about 15 percent of debris slugs formed during high flows contain man made materials such as:

- shoreline structures (primarily from docks);
- boats;
- drums and barrels ;
- vehicle tires;
- bottles and containers;
- fuel storage tanks; and
- building materials.

Unfortunately, some people view streams as convenient trash receptacles. They dump their garbage and lawn materials (such as grass clippings

and cut tree limbs) directly into the streams. Others dump garbage along stream banks and in flood plain areas or use these areas to store firewood and other materials. Such activities (whether illegal or ill-advised) increase the chances of debris being swept downstream during high water events.

What are the impacts of flowing debris throughout the Susquehanna basin?

Debris slugs can cause a variety of problems, including:

- clogging culverts and piling up behind bridge piers, which impedes river flows, aggravates flooding and increases shoreline erosion;
- creating navigational hazards as water-logged trees and large branches float just below the water line;
- reducing shoreline aesthetics and clogging docks and marina boat slips;
- limiting recreational opportunities and damaging boats;
- creating nuisances for public drinking water suppliers; and
- creating problems for the hydroelectric facilities on the lower Susquehanna River.

How is debris transported?

The greatest movement of debris occurs during times of high flows, when enormous amounts of debris are carried to the lower Susquehanna River. High flow events involving ice flows transport the most debris. (The January 1996 flood is the most recent occurrence.)

With the Susquehanna basin being one of the nation's most flood-prone watersheds, frequent high flow events are inevitable. The main stem Susquehanna River also is more prone to ice jams and subsequent flooding than any other river east of the Rocky Mountains.

What do the lower Susquehanna hydroelectric facilities do to remove debris?

During times of normal to low flows, debris in the main stem of the Susquehanna River ultimately gets trapped (at least temporarily) behind the hydroelectric dams on the lower Susquehanna River—namely at the Safe Harbor and Conowingo dams. Since 1989, the operators have removed and disposed of the debris from their facilities. Debris removal activity normally occurs between May and November. The two facilities remove about 7,000 tons of debris each year at a combined annual cost of more than \$100,000.

Debris removal at the dams is the result of a 1989 cooperative agreement by the hydroelectric facilities, the Susquehanna River Basin Commission (SRBC), the State of Maryland and other regulatory agencies.

During times of high flows, dangerous, fast flowing waters make debris removal at the hydroelectric facilities impossible. As such, the movement of debris through dam gates or over dam spillways is virtually uncontrolled at these times. A substantial portion of the debris ends up in the Chesapeake Bay.

What else is being done to reduce the amount of debris in the rivers and streams?

SRBC. The Commission has a direct interest in debris management and has historically been the only agency involved in public education to make upstream residents aware of the impacts of debris in their own region, as well as on downstream residents and businesses. Through outreach and education, upstream residents learn about the benefits of removing debris.

State and federal flood control dams. A significant amount of debris gets trapped behind flood control projects throughout the Susquehanna basin during times of normal to low flows. The amount of natural and man made debris removed yearly at these flood control facilities represents about 10 per cent of the total debris generated in the basin.

State and local governments. State and local public officials periodically inspect and remove debris at dams, bridges and road culverts and have the responsibility for enforcing existing anti-litter laws.

Volunteer stream cleanups. Throughout the entire Susquehanna River Basin, various watershed, environmental and civic organizations conduct annual or periodic volunteer river cleanup events that remove untold amounts of debris.

What else can be done to remove debris?

Given the nature of the debris problem, which is largely a natural phenomenon, it is very important to realize that governments and the private sector cannot eliminate the problem entirely. There are, however, a number of actions that can be taken to reduce the amount of debris in the basin.

SRBC. Following the January 1999 high flow event that dumped thousands of tons of debris into the lower Susquehanna River and the Chesapeake Bay, SRBC's commissioners took the following actions:

- called on the hydroelectric facilities to determine if new and improved debris removal technologies were available; and
- adopted a resolution calling on SRBC staff to investigate the feasibility of significantly enhancing its public education and outreach activities, including:
 - (1) establishing an annual river cleanup program to remove debris;
 - (2) training local government officials to help them address debris problems and enforce existing local litter laws; and
 - (3) developing a debris management presentation for SRBC's Speakers' Bureau to educate watershed organizations, schools, boating/sporting enthusiasts, shoreline property owners and others.

State and local governments can, among other actions, better enforce existing anti-litter laws.

Public and private landowners can better manage lands adjoining streams and rivers. Landowners should periodically inspect for and remove debris before high water events sweep them downstream. Landowners also should properly store floatable materials and not store firewood, storage tanks, barrels and similar items on stream banks or in flood plains.