A scenic view of a stream flowing through a forest. The water is dark and calm, reflecting the surrounding trees. Large, dark rocks are scattered along the banks and in the stream. The trees have vibrant autumn foliage in shades of yellow, orange, and red. The sky is visible through the canopy, showing a bright, overcast day. The overall atmosphere is peaceful and natural.

RESTORING  
STREAMS  
TO REDUCE  
FLOOD LOSS

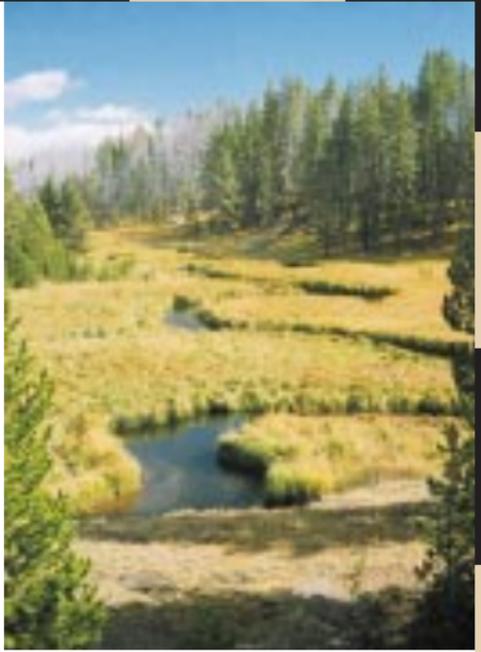
# FLOOD LOSS REDUCTION THE NATURAL WAY



Flood disasters have become a regular occurrence. One in your community may have threatened lives, damaged your property, and left dangerous blockages in nearby streams and rivers. Unless you think ahead, it will be very difficult to resolve tough problems during the chaotic and emotional period after a flood. While floods can't be prevented, many techniques are available to reduce flood impacts by maintaining the stream's ability to function naturally. Here are some ideas that may help you.

▲ Floods can devastate local communities.

- ▶ Natural stream systems act like a sponge to absorb water and energy.



# UNDERSTANDING FLOODING

Floods are natural processes. Floods occur when runoff exceeds the capacity of a stream channel and water overflows onto low-lying lands called floodplains. When people live and work in floodplains, as tens of millions of Americans do, they take the inevitable risk of experiencing flood damage. Past experience in reducing flood risks has shown that when streams lose their natural features, flooding problems become worse. In addition, these streams no longer provide other benefits such as

groundwater protection and fish habitat. New flood loss reduction strategies have been developed that help protect your property by conserving natural stream features and habitat.



- ◀ Streams that have been “cleaned” and straightened move water faster which increases erosion and the height of the flood peak.

# THE CURE CAN BE WORSE THAN THE ILL

Extensive “flood control” work in a stream can cause more problems than it solves. In-stream work that straightens channels, modifies stream banks, or alters other natural stream features usually will increase the damage caused in future floods, and will reduce natural benefits such as fish, wildlife and water quality.

▼ Heavy equipment can be necessary for both flood loss reduction and stream restoration work, but is only effective with careful use. In general, try to keep machines out of the stream channel.



◀ Think of your neighbors! A channel that has been straightened and smoothed can flush water and flood debris rapidly downstream causing damage to your neighbor's property, and downstream communities.

▶ Poorly designed and engineered “flood control” work can cause greater loss of your land through erosion, as well as siltation and clogging of the stream.



# LEARN FROM NATURE

Natural streams and floodplains reduce flood damage by reducing water velocity. They also maintain water quality by filtering sediments and pollutants; preserving and recharging groundwater supplies, providing fish and wildlife habitat; and offering areas for community recreation.

Stream bank vegetation is a valuable part of the stream system. Trees and shrubs along a stream can do more than almost any other single factor to limit flood damage.



▲ Vegetation holds stream banks together and decreases flow velocity, reducing the risk that the stream will dramatically change course and damage your property.

Many people mistakenly believe that gravel bars block river flows and should be removed. Dangerous gravel accumulations certainly occur, but most of the time gravel bars help streams maintain a deep channel that minimizes



sediment, ice, and debris accumulations which do cause flooding.

▲ Most gravel bars help prevent flow blockages and debris accumulations that exacerbate flooding.

# PREPARING FOR THE NEXT FLOOD

The perfect time to make sure that flood damage does not occur again is before repairs or reconstruction of flood-damaged structures. Quickly putting everything back the way it was may only condemn your community to repeat the cycle.



Stream work is technically demanding. With the right advice and assistance, you can reduce costly property damage in future floods, and at the same time

▲ Proper placement and design of road culverts can make the difference in the ability of your roads and stream to withstand a flood with minimal damage.

enhance the fish and wildlife benefits that come from your local stream. The best approach is to seek out expertise and to focus on long term reductions in flood risk.



◀ Riprap is sometimes necessary to stabilize banks, but poor design accelerates water velocities and erodes other downstream areas during future floods.

# WHERE TO GET HELP



Many different kinds of assistance are available to help you cope with flooding. You may want to start

with the appropriate government agencies such as the Federal Emergency Management Agency (FEMA) or the Natural Resource Conservation Service (NRCS) which may offer funding to assist your restoration efforts. Virtually all states have laws that make work in and around a river illegal without a permit. The federal Clean Water Act also requires a separate permit for many kinds of stream work. Use these permitting systems as a vehicle to help fix the causes of flooding, not as a means to just treat the symptoms. Stream-friendly flood loss reduction will not only lessen future flood impacts, but ensure a healthy stream that you can enjoy well into the future.

▲ Flood planning efforts based on the principles of stream conservation preserve the aquatic habitats essential for great fishing and other forms of outdoor recreation.



**Trout Unlimited**

1500 Wilson Boulevard, Suite 310  
Arlington, Virginia 22209-2310  
TEL 703-522-0200



**National Park Service**

**Rivers, Trails, and Conservation Assistance Program**

1849 C Street, NW, Room 3606  
Washington, DC 20240  
TEL 202-565-1200