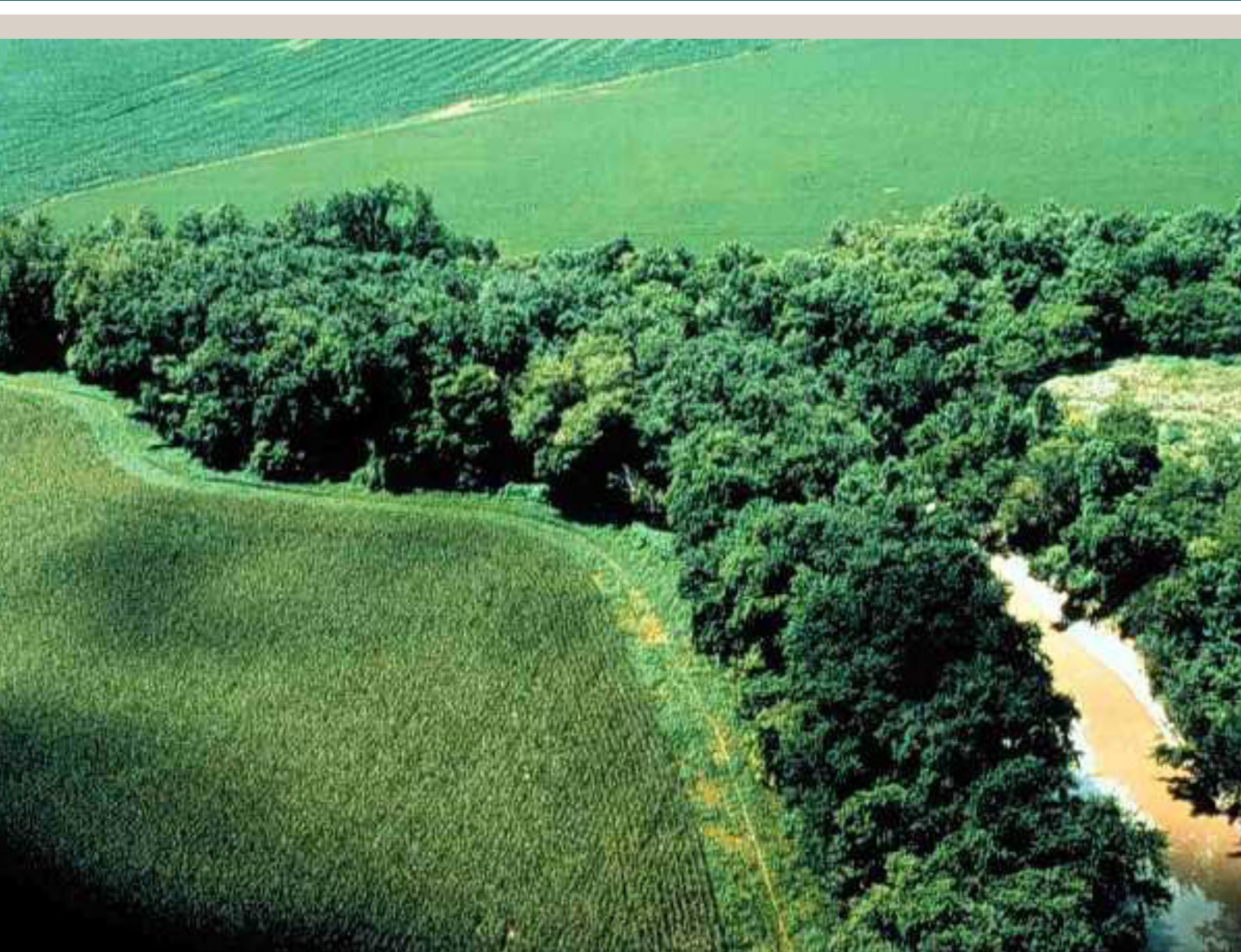


*"We forget that the water cycle and the life cycle are one." Jacques Cousteau*

## Agriculture Resiliency

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# Waterbreaks



**Snohomish Conservation District**

*working together for better ground since 1941*





# WATERBREAKS



The streams and rivers of the Pacific Northwest once flowed through a densely forested landscape, but centuries of land clearing for cities, industry, farming, and transportation have diminished our natural woody ecosystems. These forested areas moderated the effects of flooding, helping to protect uplands from damage and maintain stream and river channel integrity. Today we use flood management technologies such as dikes, levees, and complex drainage systems to allow us to develop floodplains. Unfortunately, even the best technologies have failed to stop, and have even exacerbated, large-scale flood events. With winter and spring flooding predicted to become more extreme and more frequent, new solutions are needed to effectively manage and build resiliency into our floodplain environments. Carefully planned and managed waterbreaks are one of the tools we can use to build a more resilient floodplain.

Waterbreaks are linear systems of forested plantings planned and designed to reduce flooding impacts for adjacent lands. Waterbreaks moderate the flow of water in the same way that windbreaks moderate the flow and impact of winds across landscapes.

## Benefits

Floodplains are high-risk areas for development of any type. Forested systems such as waterbreaks can allow for the maintenance of some of the natural functions of fluvial systems while reducing flood damages to transportation infrastructure and agricultural lands located within these systems (DEC, 2018).

Well-established waterbreaks reduce water velocity and allow overland surface water to soak more readily into soils. Water throughout the stream and river system is slowed and absorbed by the land, leading to an overall decrease in the volume of water running through a river system during a flood event. Without these forested zones, more water enters the river system, leading to higher water crests and stronger floods overall that create more damage (Coleman, 2007).

When properly designed and implemented, waterbreaks:

- Trap and hold debris from floodwaters
- Reduce riverbank scouring and reduce sand deposition on the landscape
- Increase riverbank stability
- Protect levee systems
- Reduce damage to roads and ditches
- Increase wildlife habitat
- Protect water quality by filtering pollution from runoff
- Provide additional farm income through the production of wood and forest products

Research on waterbreaks has shown that forested streambanks tend to collect soil while grassed and cropped banks have consistently shown significant loss of footage over time. Waterbreaks have the potential to protect levees and can significantly lower reclamation costs on farms after flood events (Dwyer et al., 1997).

## Design and Maintenance

Waterbreaks designed for agricultural land protection include primary waterbreaks that parallel a river or stream and secondary (or interior) waterbreaks that are established as field borders. Interior waterbreaks are established perpendicular to usual prevailing flood currents and tied into the primary waterbreak. Interior waterbreaks can also be



planted across the landscape in order to divert floodwaters away from high-value crops or other sensitive areas (Wallace et al., 2000).

When designing a waterbreak, there are some standard design practices to keep in mind. For quick establishment and protection, plant vigorous growing trees at 10-foot centers along the river and vigorous growing shrubs at 6-foot centers with shrubs on the upland side of the planting. Similar plants and spacing would be used for interior waterbreaks with shrubs planted on the downstream side of the planting.

Choose native species that can tolerate flood conditions and that are adapted to the soils and sun exposure where you are planting. Planting a diverse range of trees and shrubs will create habitat and discourage pest outbreaks (Wallace et al., 2000).

Once waterbreaks have been installed, maintenance is important to maintain the integrity and function of the practice. Maintenance tasks for a highly functioning waterbreak include:

- Weed control for new plantings until trees and shrubs are well established
- Protection from wildlife and/or livestock browsing
- Replanting to fill gaps
- Occasional harvesting or pruning to ensure overall vigor of plants

## How to Begin?

When considering waterbreak plantings, take note of historical flooding and future projections in order to help determine the width and layout of the waterbreaks. Consider your overall objectives for the planting. What is the current and potential future use of the landscape and what are potential secondary uses for the planting? You'll also want to take into account the overall aesthetics of the waterbreaks and implications for both upstream and downstream watersheds.

For help designing a waterbreak system that meets your needs, contact a planner from the Snohomish Conservation District at (425) 335-5634 who can assess the overall landscape.



## Find Out More

For more information on waterbreaks contact the Snohomish Conservation District at (425) 335-5634.

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