

Drainage Management



BMP Factsheet #13

SEDIMENT TRAPS

Introduction

A sediment trap is generally an easily accessible constructed 'basin' or depression on a watercourse where sediment settles out and accumulates, allowing for its removal. Sediment trap maintenance (removal of accumulated sediment) is necessary to ensure proper function. A well-functioning sediment trap enables you to trap and remove sediments regularly from one location rather than having to maintain an entire watercourse reach, saving money and reducing negative impacts to aquatic life and water quality.

Prior to installing a new sediment trap, investigate other means to control sediment input into surface waters, such as installing riparian buffers and grass filter strips. Sediment traps should not be located in areas with gravel or cobble spawning substrates and should be located downstream far enough to preclude upstream head-cut of spawning areas. Log weirs can be installed to reduce the potential of head-cuts, but need to ensure fish passage. The streambank next to the sediment trap should be planted with native trees and shrubs, leaving a small area to provide access.

Impacts

Sediment traps are not naturally occurring features of a watercourse. Sediment traps can have both benefits and drawbacks to fish and other aquatic life.

Benefits:

- Fish may benefit from deep pools creating refuge below the water column in constructed or modified watercourses.
- Downstream habitat may be improved as a result of smaller quantities of fine sediment accumulations below the sediment trap.

Drawbacks:

- Downstream habitat may be degraded and lose complexity if coarse sediments (gravel, wood) are trapped.
- In seasonal watercourses fish may become stranded in the sediment trap

rather than moving downstream as flows decrease.

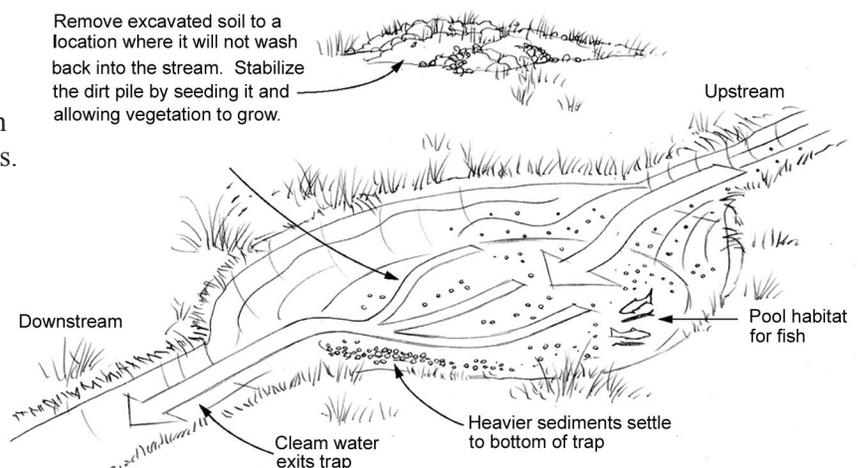
- Large or regularly maintained sediment traps may not be shaded well enough to keep water temperatures low enough to support aquatic life.
- Upstream head cutting may be a problem if sufficient gradient exists. The result can be channel destabilization and increased erosion upstream.
- Flow control structures may be needed at either end of the sediment trap. These structures will impede the natural flow of water and may impact fish passage.

Permitting

Constructing a new sediment trap requires individual permitting and is not included in a Drainage Improvement District's (DID) Drainage Management Plan (DMP). Maintaining existing sediment traps within DIDs can be permitted as a component of the DMP if the Best Management Practices (BMPs) listed below are followed.

Locating a Sediment Trap

- Locate a sediment trap where accumulations of sediment consistently occur, such as the point where two constructed ditches meet or at a significant break in slope where water velocity slows and sediment accumulates as it drops out of the water column.



SEDIMENT TRAP IS TWO TIMES AS LONG AS IT IS WIDE

- An easily accessible location such as a road crossing may also be appropriate if riparian vegetation exists or is planned, *Factsheet #20 Watercourse Re-vegetation*.

Constructing a Sediment Trap

- The size of a sediment trap depends on the velocity of the water entering the trap and the size of particles that are to be filtered out. Heavier sediments such as gravel and sand settle out faster than fine sediments such as silt or clay. Qualified professionals should be consulted.
- In lowland agricultural areas small traps may be simply constructed by widening and deepening a portion of the constructed ditch.
- Generally, the effective length of the sediment trap should be at least twice the width of the basin. To ensure slope stability the bank side slopes should be 2 horizontal to 1 vertical or flatter with a maximum height of 10ft.
- A combination of sluice gates or flashboard risers and bypass channel or bypass pipe may be useful to facilitate maintenance.

Maintaining Sediment Traps

- Accumulated sediments should be removed periodically, every 1 to 10 years depending upon sediment load.
- Clean the trap when it's half full. Do not allow sediments to build up, overflow the trap and accumulate downstream.
- Clean sediments in the late summer or early fall when the water is the lowest. If the watercourse is dry you can maintain the trap at any time, see *Factsheet #1 Hydraulic Project Approval*.

Best Management Practices for Sediment Trap Maintenance

1. Work must be completed during the time period of August 1 to September 30 when water levels are low.
2. Fish must be removed prior to maintenance work. Refer to *Factsheet #15 Fish Protection*.
3. All work must be conducted during favorable weather and low water conditions. If heavy rain occurs unexpectedly, delay maintenance until water levels recede.
4. Sediments or muddy water should not be released downstream. Monitor closely and implement Sediment Control BMPs when needed.
5. Leave riparian vegetation along the banks of the watercourse.
6. Excavation should be limited to the design profile. Deepening the trap may cause bank failure and erosion.
7. Equipment used to complete drainage maintenance activities shall only operate from the top of the channel bank and not from within the watercourse.
8. All equipment used must be in good repair and be free of excess oil and grease. All hydraulic equipment used in the watercourse must use environmentally sensitive hydraulic fluids.
9. A spill containment kit must be readily accessible on site in the event of a spill. Any spills of deleterious substance into a watercourse must be immediately reported to WDOE
10. Refueling of equipment should be conducted a minimum of 50' away from any watercourse
11. Dredged materials must be placed landward in such a way that its re-entry into the watercourse is prevented. It may be added to adjacent fields or hauled off site.

Note: The most cost effective drainage maintenance BMP is to identify the source of sediments and prevent them from entering the watercourse. See *Informational Factsheet #22 Farm Practices*.