

Overview

- Sedimentation and Erosion – What is it?
- Why do we care?
- How to spot serious issues
- Examples and solutions



Sediment Pollution



1.3 Soil Erosion

Causes of erosion
are:

- Gravity
- Wind
- Water



Why do we care?



- The effects of sedimentation on aquatic species and their habitat

A reduction of light penetration from suspended sediment:

- limits heat input
- reduces productivity at every level in an ecosystem
- affects both streams and lakes



Sediment and fish populations

- Dirt in the water will change fish feeding behavior, since prey is less visible
- Sediment reduces the abundance of insect larvae and smothers those that live on the bottom
- The suspended sediment can damage gills
- Effects of several crossings can add up

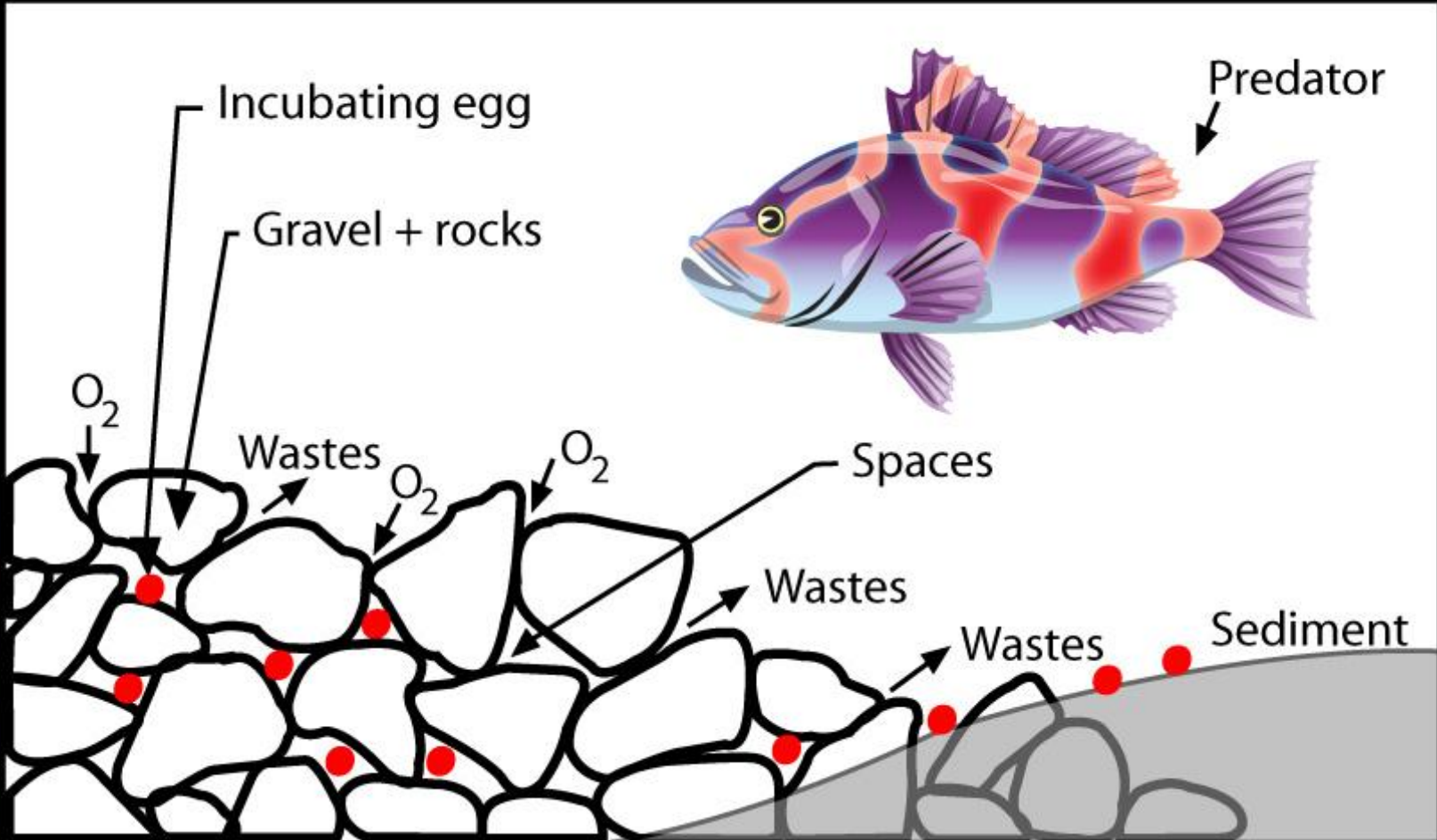


Potential impact of sediment on fish habitat

- Fish avoid areas of high sediment – leaving them with less space to live in
- Loss of spawning habitat
- Loss of insect and plant habitat
- The stream channel gets wider and shallower as it fills with sediment – then warmer



Fish Spawning



SUMMARY

To reduce the impact on fish:

- Allow fish passage through stream crossings
- Prevent erosion
- Keep “deleterious substances” out
- Save streamside vegetation



Why do we care? Government Regulations!

- Fisheries and Oceans Canada
- Alberta Sustainable Resource Development
- Alberta Environment
- The company who owns the road is responsible for the crossings
- Large fines
- Poor public image



How to spot sedimentation issues?



Gabion baskets used to armour the inflow



Bridge deck separating from road



Failed abutment



Treated wood wingwalls that are failing



Markers (Y): Good bridge reflectors



Structural problem (C): culvert sections have separated



Structural problem (S): sunken deck



Structural problem (SL): slumping caused by gullying under bridge



When used properly, silt fences are effective in controlling sedimentation



1. Preliminary Inspection



**Blocked diversion ditch
(requires remedial
measures)**

1. Preliminary Inspection



False ditch



Ditch



3. Sediment Source Inspection



4. External Sediment Source Inspection



4. External Sediment Source Inspection



4. External Sediment Source Inspection





2006



2010



Mud build up on deck







2006



2011

Preventive Measures

- Armouring exposed soil
- Diverting flowing water
- Road Maintenance
- Monitoring for effectiveness
- Reporting



Vegetation is considered armour from an erosion perspective



Armour – Silt Fence



Armour – Silt Fence



Armour - vegetation



Armour – Rip Rap



Riprap, silt fence and geotextile curb



When used properly, silt fences are effective in controlling sedimentation







Rip Rap Armour



Slash, Rip Rap and Silt Fencing



Diversion Ditch - Maintain



Summary Discussion

- What resources do you need to improve the condition of stream crossings on your company's road?

