

Soos Creek Fine Sediment TMDL – Conceptual Model

Washington State Department of Ecology

The following steps describe the pathway along which land use changes can impair the health of benthic macroinvertebrates:

1. Development

As the population in a watershed increases, the pressure to convert vegetated areas (e.g., forests, meadows, wetlands) to a built environment increases.

2. Impervious cover

Hard surfaces, such as buildings, roads, parking lots, increase with development. These surfaces reduce the ability of the landscape to infiltrate stormwater.

3. Stormwater runoff

Older stormwater infrastructure is built to deliver runoff to streams efficiently, preventing stormwater infiltration into soils and resulting in high stream flows during rain events.

4a. Stream flashiness

Stormwater runoff increases instream flows to levels that are much higher than those that would have occurred before development. These flows can be of short duration but intense.

4b. Instream erosion

Increased instream flows due to stormwater runoff increase erosive forces and mobilize fine sediment from stream banks and stream bed.

5. Upland sediment

Stormwater also carries fine sediment to streams from developed areas that are upland in the watershed.

6. Fine sediment

Fine sediment from upland and formed through erosion settle on the stream bed and clog the spaces between cobbles and rocks.

7. Benthic invertebrates

The fine sediment that clogs interstitial spaces between stream bed cobbles degrades habitat for benthic macroinvertebrates.