YOOKWA 2003 Compendium

Objective

Reach 1 of Yookwa Creek is an alluvial fan built by material depositing between the upstream canyon reach and the downstream Vernon Lake/Sebalhall River. Forest harvesting on the fan has weakened the channel banks and resulted in an over-widened channel with a very high coarse sediment load that is delivered downstream. This coarse sediment is impacting valuable fish habitat in Sebalhall River, Nimpkish River and Vernon Lake.

Strategies to stabilize the channel on the fan include 1) encouraging revegetation of extensive coarse sediment deposits, 2) creation of high-flow distributary channels such as are found on undisturbed fans, and 3) protect existing banks against erosion where possible.

The objective of work at these sites is to promote the distribution of flood flows over the fan and reduce the capacity of the main channel to transport coarse sediment. Reduced transport capacity should result in increased deposition of coarse sediment on bar tops and eventual stabilisation of the fan channels. Reducing the coarse sediment delivery to the downstream reaches of Sebalhall River should reduce bank erosion and create increased pool depths in this highly valuable habitat. Diversion of normal, or average, flows is not expected. However, because most of the transport of sediment downstream in fluvial channels is thought to occur at, or near, bankfull stage, the distributary channels should be functioning on a yearly or bi-yearly basis.

WLAP Region/ MOF Region
Vancouver Island/Vancouver

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Proponent/Implementing Partners
Partnership of Canadian Forest Products Ltd, 'Namgis First Nation and IWA. This work was carried out under the guidance of the Nimpkish Resource Management Board (NRMB).

Watershed/Stream
Nimpkish River/Yookwa Creek

Location
Yookwa Creek flows easterly to Lower Sebalhall River. Sebalhall River flows northerly into Nimpkish River, just above Nimpkish Island Ecological Reserve, approximately 24 km southeast of the town of Woss on northern Vancouver Island.

Introduction
Yookwa Creek has a moderate sized basin in the upper Nimpkish River watershed. Forest harvesting on the fan has weakened the channel banks and resulted in an over-widened channel with a very high coarse sediment load that is delivered from the alluvial fan to the Sebalhall River and the Nimpkish River. Several engineering studies were carried out to determine where the sediment is coming from, how stable the system is now and options to deal with the situation.

During the winter of 2002 and spring of 2003 the Yookwa Technical Working Committee, as appointed by the NRMB, approved the restoration concept of working with the current channel configuration of Yookwa Creek on its fan while attempting to restore a more natural stream system of distributary channels[1]. These occasionally

[1] A distributary channel is a river branch that flows away from the main stream and does not rejoin it, common on alluvial fans. On Yookwa Creek fan, distributary channels flow across the fan into Vernon Lake or lower Sebalhall River without rejoining the main stream.

wetted channels allow floods flow to travel to Vernon Lake along alternate paths to the main channel, reducing flow in the main channel. This condition encourages coarse sediment deposition on the fan surface, decreasing throughput to Sebalhall River, thus reducing impacts to downstream reaches.

Assessment and Prescription

Several outside experts (including DFO and WLAP) were consulted before the final prescription was developed by Northwest Hydraulic Consultants.

Rehabilitation Work

Site YK1DC1 - Distributary Channel at 600m on the Right Bank (Type 3)

- Excavated 120m length of channel through the Yookwa Creek bank to encourage flood flows in Yookwa Creek to leave the main channel and flow along an alternate route to Vernon Lake.
- The excavated section of the grade was lined with local gravel and cobbles to a depth of about 0.3m to add some resistance to the bed of the new channel.
- Cleared trees and shrubs from the centreline of the channel alignment for a 450m length below the excavated channel to ensure the connectivity of the channel to Vernon Lake to avoid stranding fish that may enter the channel during flood flows.
- Constructed a 25m long, 2m high, and 1.0m deep riprap apron at the head of the channel to prevent flood flows from eroding the opening and expanding the channel.

Site YK1DC2- Distributary Channel at 900m on the Right Bank (Type3)

- Excavated 130m length of channel to a depth of 0.5-2.0m through the Yookwa Creek bank to encourage flood flows in Yookwa Creek to leave the main channel and flow along an alternate route to Vernon Lake. Material removed from the channel was spoiled on the access roads using the dump truck. The volume was too great to side cast.
- Cleared small logjams and sediment wedges for a distance of about 225m between the upper excavation and the access road. This section of the channel contained flowing water in the past and only required minimal clearing to allow flood flows to pass along the channel.
- Excavated 90m length of channel to a depth of about 1.1m through the access road to connect the upper and lower channels. All material removed from the channel was side cast.
- Cleared trees and shrubs from the centreline of the channel alignment for a 425m length below the excavated channel to ensure the connectivity of the channel to Vernon Lake to avoid stranding fish that enter the channel.
- Constructed a 25m long, 2.5m high, and 1.0m deep riprap apron at the head of the channel to prevent flood flows from eroding the opening and expanding the channel.
- A debris catcher was constructed logs and rock anchors to prevent debris that is carried along the upstream bank from blocking the entrance to the channel.
- Constructed a logjam to pond water at the mouth of the distributary channel allowing a greater portion of the flow to enter the channel.

For Further Information

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