Design and Installation of Embedded Culverts

Kamloops
March 12, 2002

Pilot 2

Part 4: Inspection and Maintenance
Objective

• Ongoing inspection and maintenance of stream crossings and control structures must be conducted on a regular basis to ensure they:
  – Protect fish and fish habitat
  – Maintain safe fish passage
  – Reduce the risk of releasing sediment or other deleterious substances
Inspection and Maintenance

- Embedded culvert should be inspected regularly for:

1. Substrate retainment
2. Flow
3. Scour/aggradation
4. Fill/culvert settlement and distortion
5. Debris
6. Riprap
7. Roadway sediment control
1. Substrate Retainment

- If inspection reveals that substrate is not being retained, original design parameters should be re-evaluated
- Simply replacing streambed substrate is not acceptable (may cause downstream pool infilling)

- Larger rock may have to be installed in a interlocking fashion
- Design discharge must be maintained
- Specialist consultation may be required
Inspection and Maintenance

2. Flow

- Inspect at low flow condition and after significant flood events.
- Ensure water is remaining on the surface and that low channel exists for fish passage.
- Fines may have to be washed into substrate and/or downstream weir installed.
3. Scour

- Inspect for scour at outlet and inlet
- Inspect for streambed aggradation upstream or downstream
- Maintain downstream weir
4. Fill Settlement and Culvert Distortion

• Fill/culvert should be inspected for settlement and distortion
5. Debris

- Trash racks may be designed and installed to accommodate fish passage

- Culvert should be cleared of debris as soon as possible
6. Riprap

- Riprap should be inspected and augmented or replaced as required.
7. Roadway Sediment Control

- Instruct grader operators to prevent blading material into stream
- Maintain existing vegetation inside ditch closest to the steam to allow for filtering sediment
- Ensure cross drains and ditch blocks are functioning
7. Roadway Sediment Control

- Maintain vegetation by hydroseeding and fertilizing
- Ensure ditch outflows near the crossing discharge onto vegetated area, into a sump or other sediment control device and not directly into stream
- Maintain or reinstall all permanent erosion control devices
Summary

• Inspection and maintenance is key in keeping embedded culverts functioning properly.

• Areas to focus on:
  - Substrate retainment
  - Flow
  - Scour/aggradation
  - Fill/culvert settlement and distortion
  - Debris
  - Riprap
  - Roadway sediment control
Acknowledgements

2 Pilot Projects

Hotfish Creek
Gary Forster – Road Construction Foreman, Riverside Forest Products

Stuart Creek
Dan Dobson – MOF SBFEP Technician, 100 Mile House, BC