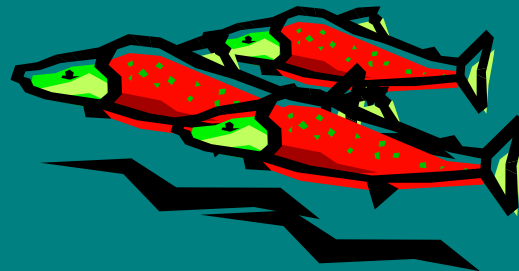


**Kamloops**  
**March 12, 2002**

**Pilot 2**

# **Design and Installation of Embedded Culverts**

## **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

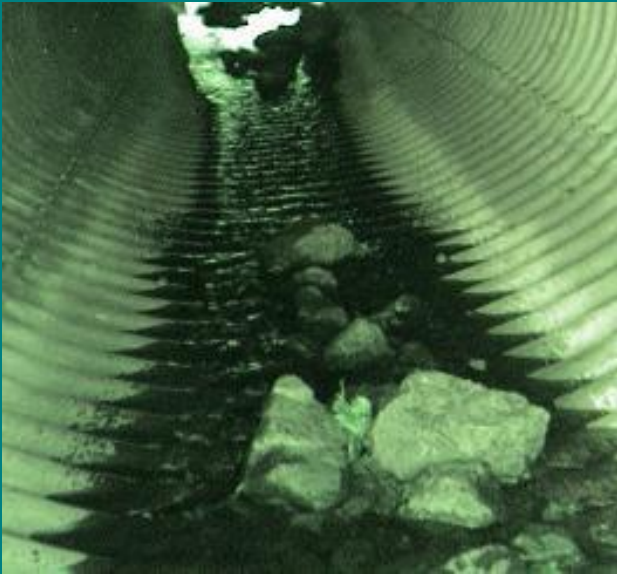


# Inspection and Maintenance

- 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 an interlocking fashion
- Design discharge must be maintained
- Specialist consultation may be required



## 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



- Culvert should be cleared of debris as soon as possible

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





## 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 stream 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**

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## 2 Pilot Projects

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