

WSDOT Statewide Fish Passage Monitoring Plan

To ensure that fish passage projects are constructed as designed, the state instituted post-project monitoring. Each completed fish passage barrier correction is evaluated after construction to ensure that it conforms to the design and permits. The project is reevaluated within one year of construction and at years 5 and 10 following construction to ensure that it remains passable and provides continuity of stream processes throughout the project limits. Frequency of monitoring can be increased at the discretion of WSDOT Stream Restoration Program with the intent to closely monitor any condition beyond expected norms and to determine if corrective action is necessary to maintain stream function or fish passage.

1. **Post Construction Inspection:** following construction, projects are evaluated to ensure that the construction conforms to designs and permits. At a minimum the following project elements are inspected to ensure consistency with the design and permits:
 - Culvert/bridge span
 - Culvert rise
 - Culvert/bridge type
 - Streambed mix
 - Streambed shape
 - Streambed slope
 - Other design features such as LWM, meander bars, bands, boulder clusters, etc.
 - Channel function elements throughout the entire project limits listed in items 3 and 4 below
2. **Over-Winter Evaluation:** fish passage projects are reassessed after the first winter following completion of the initial construction to evaluate the impact from higher winter flows on fish passage and stream function throughout the project limits. Data collected include parameters listed in items 3 and 4 below.
3. **Long-Term Evaluation:** 5 and 10 years after construction each fish passage project is evaluated to determine whether it still provides effective fish passage and stream function.
 - At each sampling interval, the project limits are assessed for fish passage.
 - An assessment is made to determine if the project still conforms to the design standards under which it was constructed. Monitoring parameters, as described in section 4 below, provide a framework for evaluation.
4. **Monitoring Parameters:** these individual elements are evaluated to ensure the project continues to provide fish passage and stream function throughout the project limits.
 - **Streambed Material:** Is there streambed material throughout the culvert and design channel? How does the material compare to the common condition?
 - **Flow:** Is there a loss of surface flow anywhere in the project limits atypical of the stream's hydrology? Does a defined channel and a low-flow thalweg exist through the entire length of the project limits? How does the water depth through the project limits compare to the common condition?
 - **Channel Path:** Is the location of the thalweg predominantly along the edge of the culvert? What is the percentage of channel length entrained and does it alternate sides? Is it full span? Describe the channel's flow path and how does it compare to the channel immediately outside of the project limits?
 - **Channel Cross-Section:** How wide is the constructed stream channel? How do the width and depth compare to the common condition? How well does the design channel tie into the common condition?
 - **Channel Slope:** What is the channel slope through the structure, upstream, and downstream of the structure? How does the overall project slope compare to the slope of the common condition?

- Hydraulic Drops: Are channel-spanning hydraulic drops present within the project limits? If so, how do the hydraulic drops compare to the original design, previous monitoring assessments, and common condition? Do any hydraulic drops exceed the maximum allowed for fish passage?
- Other Design Features: Do constructed hydraulic and habitat complexity features function as intended throughout the project limits?
- Final Determination: Is the project fish passable? Are risks noted to the continuity and long-term function of the stream channel within the project limits? Determine if action is needed following the guidelines below.

Actions Determined by Monitoring

The responses to the monitoring parameters help determine the course of action taken by the state. Actions are determined on a case-by-case basis and involve one of the following solutions. If the fish passage project fails to provide fish passage, the project will be repaired, modified, or replaced.

1. No Action Needed
 - The project provides fish passage and stream function. The responses to the monitoring standards are within expected norms.
2. Increased Monitoring
 - The project provides fish passage and stream function. Some of the responses to the monitoring standards are beyond the expected norms. This action is taken when stream processes may naturally correct the substandard responses.
3. Repair
 - The project is in danger of losing fish passage or stream function but can be restored by activities within the scope of maintenance work. This may be initiated at any time, after a period of increased monitoring or after a site-specific meeting with the Tribes. Any repair is monitored to ensure that it functions as designed.
4. Modification
 - The project has lost fish passage or stream function but can be restored with a modification to the original design. This may be initiated at any time, after a period of increased monitoring, or after a site-specific meeting with the Tribes. Any modification is monitored to ensure that it functions as designed.
5. Replace
 - The structure has lost fish passage and stream function and can only be restored through complete replacement of the structure. This can be determined after a catastrophic event, a period of increased monitoring, continued failures of a Repair or Modification, or after a site-specific meeting with the Tribes.

Documenting Results

Summary results of WSDOT's Fish Passage Monitoring are available in the annual *WSDOT Fish Passage Performance Report* posted on the [WSDOT Fish Passage website](#).

Parties external to WSDOT can access monitoring reports on the [WSDOT Fish Passage Inventory Web Map](#).

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