# Generic Substrate and Whitefish Spawning

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Function Updated by mbayly on Sat, 02/17/2024 - 23:09.

## Species Information

**Common Name:** Whitefish (generalized)

## Stressor Details

**Stressor Name:** Substrate
**Units:** (see notes)
**Metric:** Substrate Class Categorical
**Scale:** linear
**Function Type:** step
**Vital Rate/Process:** HSI

## Life Stage & Context

**Life Stages:** Spawners
**Geography:** Washington
**Activity:** Spawning

## Descriptions

### Overview

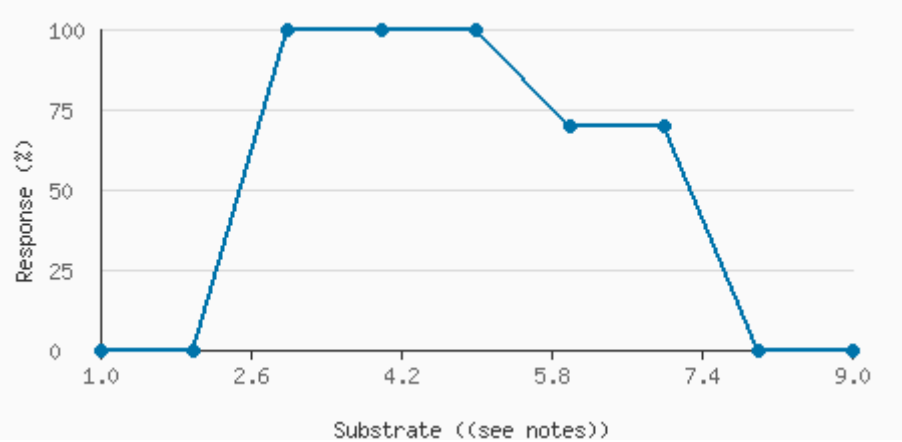
WDFW and Ecology recommended Habitat Suitability Criteria (HSC) or preference codes and values for instream flow modeling using PHABSIM or RHABSIM models. These values are based on habitat suitability studies. WDFW and/or Ecology staff (or individuals following WDFW-Ecology study guidelines) recorded the depth, velocity, substrate, and cover used by fish in a study reach.

Recommended Preferences do not always accurately reflect local conditions. Therefore, these preference values should only be used after consultation with and written agreement of WDFW and/or Ecology instream flow biologists. HSI preference curves are being revised continually as new data are obtained and analyzed. Please contact the Department of Ecology or WDFW for the most recent preference curves for salmon, trout, and other game fishes.

Cover Classes
1 - silt, clay, or organic
2 - sand
3 - sm gravel (0.1-.5")
4 - med gravel (.5-1.5")
5 - lrg gravel (1.5-3")
6 - sm cobble (3-6")
7 - lrg cobble (6-12")
8 - boulder (>12')
9 - bedrock

Source: See TABLE 1. Generic Cover/Substrate Codes and Preference Value

## Stressor Response Data




| Raw Stressor Values | Scaled Response Values 0 to 100 | SD | low.limit | up.limit |
|---|---|---|---|---|
| 1 | 0 | 0 | 0 | 100 |
| 2 | 0 | 0 | 0 | 100 |
| 3 | 100 | 0 | 0 | 100 |
| 4 | 100 | 0 | 0 | 100 |
| 5 | 100 | 0 | 0 | 100 |
| 6 | 70 | 0 | 0 | 100 |
| 7 | 70 | 0 | 0 | 100 |
| 8 | 0 | 0 | 0 | 100 |
| 9 | 0 | 0 | 0 | 100 |

## Citations

Beecher, H., Caldwell, B. (2022). INSTREAM FLOW STUDY GUIDELINES. Technical and Habitat Suitability Issues Including Fish Preference Curves. UPDATED, January 25, 2022. 04-11-007

## References

(Beecher and Caldwell 2022) - https://apps.ecology.wa.gov/publications/documents/0411007.pdf