WAC 173-183-620 Habitat index. (1) Most state freshwaters vary to some degree from the natural condition as increased activities within individual watersheds have decreased stream, river, and/or lake habitat quality. In order to account for that degradation prior to assessing damages using the compensation schedule, a habitat index (HI) is calculated to represent existing stream conditions prior to the oil spill.

(2) For each stream, river, or lake impacted by an oil spill where the preassessment screening committee determines that the compensation schedule shall be used, a habitat index (HI) shall be calculated following an oil spill using the following methodology. The HI measures the amount of stream degradation from natural conditions and shall be calculated using the following formula:

Habitat Index (HI) = $[(P_1+P_2+P_3+P_4+P_5+P_6) \div N_p] \times f_1 \times f_2 \times f_3$

where: P_1 = barriers to natural fish movement

P_2 = urbanization

P_3 = condition of riparian vegetation

P_4 = condition of flood plain

P_5 = land use of watershed

P_6 = flow alteration

N_p = number of P parameters used to calculate HI

f_1 = channel modifications

f_2 = impoundment

f_3 = water quality

(3) The RDA committee shall determine which of the habitat quality parameters described in subsection (2) of this section are applicable to the particular spill under consideration. If a parameter is not applicable to the spill under consideration, the parameter shall not be included in the formula provided in subsection (2) of this section.

(4) Habitat quality parameters (P).

(a) Barriers to natural fish movement (P_1). Barriers, to some degree, limit the free passage of fish upstream thus limiting the ability of streams to recover. The scoring of this parameter is based on the influence of barriers in the natural dispersal of fish populations as follows:

Table 12. Scoring of Barriers to Natural Fish Movement (P_1).

RATING	QUALIFICATION
10	No manmade obstructions to free upstream passage of fish
8	No dams or other structures causing a vertical drop of more than 1 foot during low flow
5	No dams or other structures causing a vertical drop of more than 3 foot during low flow
3	No dams or other structures causing a vertical drop of more than 10 foot during low flow
0	One to several dams or other structures each causing a drop of more than 10 feet during low flow

(b) Urbanization (P_2). Urban development has historically had negative habitat effects on freshwater ecosystems. The percent of urban development in a watershed directly influences siltation, riparian

abuse, and water quality deterioration. The scoring of this parameter is based on the percent of urbanization in the stream watershed.

Table 13. Scoring of Urbanization (P_2).

RATING	QUALIFICATION
10	Less than 5 percent of the watershed in urban development
8	Five to 10 percent of the watershed in urban development
5	Ten to 40 percent of the watershed in urban development
3	Forty to 70 percent of the watershed in urban development
0	Seventy to 100 percent of the watershed in urban development

(c) Condition of riparian vegetation (P_3). Riparian vegetation is important to seventy percent of the animal and bird species in Washington for some part of their life cycle. It also exerts thermal regulatory and thermal controls for the aquatic system. The scoring of this parameter is based on the percent of banks that are protected by effective riparian vegetation.

Table 14. Scoring of Condition of Riparian Vegetation (P_3).

RATING	QUALIFICATION
10	Ninety to 100 percent of the banks are protected by appropriate perennial vegetation
8	Sixty to 90 percent of the banks are protected by appropriate perennial vegetation
5	Forty to 60 percent of the banks are protected by appropriate perennial vegetation
3	Ten to 40 percent of the banks are protected by appropriate perennial vegetation
0	Zero to 10 percent of the banks are protected by appropriate perennial vegetation

(d) Condition of the flood plain (P_4). The condition of the flood plain forecasts the amount of sedimentation and erosion in the watershed and as such is a primary predictor of stream degradation. The rating of this parameter is as follows:

Table 15. Scoring of the Condition of the Flood Plain (P_4).

RATING	QUALIFICATION
10	Little or no evidence of active or recent erosion of the flood plain during floods
5	All segments show evidence of occasional erosion of the flood plain. Stream channel essentially intact
0	Flood plain severely eroded and degraded, stream channel poorly defined with much lateral erosion and much reduced flow capacity

(e) Land use of the watershed (P_5). Land use practices exert a great deal of influence on the quality of the aquatic habitat. The rating of this parameter is as follows:

Table 16. Scoring of Land Use of the Watershed (P_5).

RATING	QUALIFICATION
10	More than 80 percent of the watershed protected by timber, improved pasture, terraces, or other conservation practices
8	Sixty to 80 percent of the watershed protected by timber, improved pasture, terraces, or other conservation practices
5	Forty to 60 percent of the watershed protected by timber, improved pasture, terraces, or other conservation practices
3	Twenty to 40 percent of the watershed protected by timber, improved pasture, terraces, or other conservation practices
1	Zero to 20 percent of the watershed protected by timber, improved pasture, terraces, or other conservation practices

(f) Flow alteration (P_6). Alteration of the natural flow regime can frequently alter habitat conditions that are necessary for certain behavioral and ecological needs of species. The rating of this parameter is as follows:

Table 17. Scoring for Flow Alteration (P_6).

RATING	QUALIFICATION
10	Less than 1 percent of the watershed controlled by impoundments and/or less than 50 percent of the watershed controlled by farm ponds
8	One to 30 percent of the watershed controlled by impoundments and/or less than 50 percent of the watershed controlled by farm ponds
5	Thirty to 60 percent of the watershed controlled by impoundments and/or less than 50 percent of the watershed controlled by farm ponds
3	Sixty to 95 percent of the watershed controlled by impoundments and/or less than 50 percent of the watershed controlled by farm ponds
0	Ninety-five to 100 percent of the watershed controlled by impoundments and/or less than 50 percent of the watershed controlled by farm ponds

(5) Habitat alteration functions (F). Each habitat alteration function has the power to reduce the habitat quality rating, dependent on the type and extent of alteration. Functions are expressed on a scale of 0 to 1.0.

(a) Channel modification (F_1). Channel modification can have a dramatic effect of the ability of a stream to provide for a diversity of habitats. This parameter is rated as follows:

$$\text{Channel Modification } (F_1) = 1.0 - (SM*FR)$$

where F_1 = Channel modification rate

SM = Percent stream reach modified, expressed as a decimal

FR = Percent fish reduction, expressed as a decimal

Table 18. Scoring for Percent Fish Reduction (FR).

CHANNEL MODIFICATION	% FISH REDUCTION
Clearing, Snagging	25

CHANNEL MODIFICATION	% FISH REDUCTION
Channel realignment	80
Channel paving	95

(b) Water quality (F_2). Water quality exerts a variety of detrimental and/or beneficial on the aquatic ecosystem. This parameter is rated as follows:

Table 19. Scoring for Water Quality (F_2).

RATING	QUALIFICATION
1.0	Stream water unpolluted. No pollutants detected by standard methods
0.8	Occasional above normal levels of one or more water pollutants usually present, but detectable only by analysis
0.5	Occasional visible signs of oversupply of nutrients or other pollutants detected by analysis
0.4	Occasional fish kills averaging about every 4 years or more
0.2	Occasional fish kills occurring more often than every 4 years
0.0	Grossly polluted waters with fish kills occurring annually or more frequently

(c) Streambed condition (F_3). The condition of the substrate habitat can be altered in such a way as to reduce the effective habitat available to the aquatic community as a whole. This parameter is ranked as follows:

Table 20. Scoring of Streambed Condition.

RATING	QUALIFICATION
1.0	No apparent unstable material in channel with substrate of bedrock, boulders, rubble, gravel or firm alluvium
0.9	Traces of unstabilized silt, sand, or gravel in quiet areas or large pools with firm substrate
0.8	Quiet areas covered with unstable materials, deep pools restricted to areas of greatest scour
0.7	Pools shallow, filled with silt, sand or gravel, riffles contain noticeable silt deposits
0.5	Streambed completely covered by varying thicknesses of transported material such as silt, sand and gravel
0.0	Stream channel nearly or completely filled with unconsolidated, transported material; no surface flow except during floods

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.