

WAC 173-183-450 Salmon vulnerability. (1) The salmon vulnerability ranking is based on seasonal habitat preference of juveniles during outmigration, adults as they return to spawn and the presence of oil in river mouths during peak occurrence of salmon runs. The salmon vulnerability ranking was developed from existing information and determinations of the salmon subcommittee of the scientific advisory board. In the case of Chinook salmon, habitat preference differs for subyearlings and yearlings.

(2) The vulnerability of five salmon species in nine habitats are relatively scored for vulnerability to oil spills on a 1 to 5 scale for each season, where 5 represents the most vulnerable condition, and a score of 1 represents the least vulnerable condition, as follows:

Table 7. Vulnerability of Salmon Species and/or Species Yearclass by Habitat and Season

SPECIES/YEARCLASS and SALMON VULNERABILITY HABITAT	HABITAT VULNERABILITY SCORE (savs) SEASON			
	SP	SU	FA	WI
<u>Chinook (subyearling)</u>				
Intertidal				
Rocky	1	1	1	1
Cobble	2	2	1	1
Gravel	3	3	2	2
Sand (vegetated)	4	5	3	3
Sand (no vegetation)	3	3	2	2
Mud (vegetated)	4	5	3	3
Mud (no vegetation)	3	3	2	3
Subtidal	2	2	1	1
Pelagic	4	4	3	3
<u>Chinook (yearling)</u>				
Intertidal				
Rocky	1	1	1	1
Cobble	3	3	2	2
Gravel	3	3	3	2
Sand (vegetated)	3	3	2	2
Sand (no vegetation)	3	3	2	2
Mud (vegetated)	3	3	2	2
Mud (no vegetation)	3	3	2	2
Subtidal	2	2	1	1
Pelagic	4	4	3	3
<u>Coho</u>				
Intertidal				
Rocky	1	1	1	1
Cobble	3	2	2	2
Gravel	3	4	2	2
Sand (vegetated)	5	4	3	4
Sand (no vegetation)	3	2	2	3
Mud (vegetated)	5	4	3	4
Mud (no vegetation)	3	4	2	3
Subtidal	2	2	1	1

SPECIES/YEARCLASS and SALMON VULNERABILITY HABITAT	HABITAT VULNERABILITY SCORE (savs) SEASON			
	SP	SU	FA	WI
Pelagic	4	4	3	3
<u>Pink</u>				
Intertidal				
Rocky	1	1	1	1
Cobble	2	1	1	1
Gravel	3	1	1	3
Sand (vegetated)	5	2	2	5
Sand (no vegetation)	3	2	2	3
Mud (vegetated)	5	2	2	5
Mud (no vegetation)	3	1	1	3
Subtidal	2	1	1	1
Pelagic	4	2	2	2
<u>Chum</u>				
Intertidal				
Rocky	1	1	1	1
Cobble	2	1	1	1
Gravel	3	2	2	3
Sand (vegetated)	5	3	2	5
Sand (no vegetation)	3	2	2	3
Mud (vegetated)	5	4	2	5
Mud (no vegetation)	3	2	2	3
Subtidal	2	2	1	1
Pelagic	4	4	2	2
<u>Sockeye</u>				
Intertidal				
Rocky	2	2	1	1
Cobble	2	1	1	1
Gravel	2	1	1	1
Sand (vegetated)	2	1	1	1
Sand (no vegetation)	2	1	1	1
Mud (vegetated)	2	1	1	1
Mud (no vegetation)	3	1	1	1
Subtidal	1	2	1	1
Pelagic	4	4	2	2

The habitat-types classified under WAC 173-183-400 correlate with the habitats listed in Table 7 as follows:

TABLE 8. KEY TO TRANSLATING MARINE/ESTUARINE HABITAT TYPES CLASSIFIED UNDER WAC 173-183-410 TO SALMON VULNERABILITY HABITATS

MARINE/ESTUARINE HABITAT TYPE from WAC 173-183-410(3)	EQUIVALENT SALMON VULNERABILITY HABITAT
Marine Intertidal, exposed and semiexposed rocky shores	Intertidal, rocky
Marine Intertidal, sand-scoured rocky shores	Intertidal, rocky
Marine Intertidal, protected rocky shores	Intertidal, rocky

MARINE/ESTUARINE HABITAT TYPE from WAC 173-183-410(3)	EQUIVALENT SALMON VULNERABILITY HABITAT
Estuarine Intertidal, open rocky shores	Intertidal, rocky
Marine Intertidal, semiexposed cobble and mixed-course beaches	Intertidal, cobble
Estuarine Intertidal, open mixed-course beaches	Intertidal, cobble
Marine Intertidal, semiexposed gravel beaches	Intertidal, gravel
Estuarine Intertidal, open gravel beaches	Intertidal, gravel
Marine Intertidal, exposed sandy beaches	Intertidal, sand (presence of vegetation will be determined at the time of the spill)
Marine Intertidal, semiprotected mixed-fine beaches	Intertidal, sand (presence of vegetation will be determined at the time of the spill)
Estuarine Intertidal, open sandy beaches	Intertidal, sand (presence of vegetation will be determined at the time of the spill)
Estuarine Intertidal, sandy low marshes	Intertidal, sand (presence of vegetation will be determined at the time of the spill)
Estuarine Intertidal, mixed-fine beaches and low marshes	Intertidal, sand (presence of vegetation will be determined at the time of the spill)
Marine Intertidal, protected mud flats	Intertidal, mud (presence of vegetation will be determined at the time of the spill)
Estuarine Intertidal, mud flats	Intertidal, mud (presence of vegetation will be determined at the time of the spill)
all Marine and Estuarine Subtidal categories except open water	Subtidal
Marine Subtidal, open water	Pelagic
Estuarine Subtidal, open water	Pelagic

(3) For each oil spill where the compensation schedule is applied, the RDA committee shall determine the following:

(a) For spills greater than 1,000 gallons, the salmon vulnerability habitat(s) exposed to spilled oil and each habitat's percent-coverage of the total area exposed to spilled oil;

(b) For spills of less than 1,000 gallons, the salmon vulnerability habitat(s) in the subregion(s) exposed to spilled oil and the percent-coverage of these habitats in the exposed subregion(s);

(c) The season in which spill impacts will be greatest;

(d) The individual species/year class vulnerability score (SAVSi) as described in subsection (4) of this section; and

(e) The composite salmon vulnerability score for a spill (SAVSS) as described in subsection (5) of this section.

(4) From the information enumerated in subsection (2) of this section, the RDA committee shall determine the species/year class vulnerability score for a spill (SAVSi) by summing the weighted species/year class vulnerability scores for each of the salmon vulnerability habitats classified in Table 8 of subsection (2) of this section, where weighting is defined as percent-coverage of the salmon vulnerability habitats as determined in subsection (3) of this section, as follows:

$$SAVSi = (sav_{s1} * PCT-COV_1) + (sav_{s2} * PCT-COV_2) + \dots + (sav_{sn} * PCT-COV_n)$$

where SAVS_i = salmon vulnerability score for a species/
year class;
savs_j = species/year class habitat vulnerability
score for the season of greatest spill impact from
subsection (2) of this section;
PCT-COV_j = percent-coverage of habitat j from
subsection (2) of this section;
i = Chinook, subyearling (Cs); Chinook, yearling
(Cy); Coho (C); Pink (P); Chum (Ch); and
Sockeye (So); and
n = the number of salmon vulnerability habitats
used to calculate SAVS as determined in
subsection (3) of this section.

(5) The raw salmon vulnerability score for a spill (SAVS_s) shall be calculated as follows:

(a) In years when pink salmon are present in state waters. The chinook salmon spill vulnerability scores for subyearlings (SAVS_{Cs}) and yearlings (SAVS_{Cy}) as determined in subsection (4) of this section shall be averaged, then added to the spill vulnerability scores for coho (SAVS_C), pink (SAVS_P), chum (SAVS_{Ch}) and sockeye (SAVS_{So}) salmon as determined in subsection (4) of this section. The sum of these scores shall then be divided by 5, as described by the following formula:

$$SAVS_s = [(SAVS_{Cs} + SAVS_{Cy})/2 + SAVS_C + SAVS_P + SAVS_{Ch} + SAVS_{So}]/5$$

where SAVS_s = salmon vulnerability score for a spill;
SAVS_{Cs} = chinook, subyearling vulnerability score
from subsection (4) of this section;
SAVS_{Cy} = chinook (yearling) vulnerability score
from subsection (4) of this section;
SAVS_C = coho salmon vulnerability score from
subsection (4) of this section;
SAVS_P = pink salmon vulnerability score from
subsection (4) of this section;
SAVS_{Ch} = chum salmon vulnerability score from
subsection (4) of this section;
SAVS_{So} = sockeye salmon vulnerability score
from subsection (4) of this section;

(b) In years when pink salmon are not present in state waters. The chinook salmon spill vulnerability scores for subyearlings (SAVS_{Cs}) and yearlings (SAVS_{Cy}) as determined in subsection (4) of this section shall be averaged, then added to the spill vulnerability scores for coho (SAVS_C), chum (SAVS_{Ch}) and sockeye (SAVS_{So}) salmon as determined in subsection (4) of this section. The sum of these scores shall then be divided by 4, as described by the following formula:

$$SAVS_s = [(SAVS_{Cs} + SAVS_{Cy})/2 + SAVS_C + SAVS_{Ch} + SAVS_{So}]/4$$

where SAVS_s = salmon vulnerability score for a spill;
SAVS_{Cs} = chinook, subyearling vulnerability score
from subsection (4) of this section;
SAVS_{Cy} = chinook (yearling) vulnerability score
from subsection (4) of this section;
SAVS_C = coho salmon vulnerability score from
subsection (4) of this section;
SAVS_p = pink salmon vulnerability score from
subsection (4) of this section;
SAVS_C = chum salmon vulnerability score from
subsection (4) of this section;
SAVS_{So} = sockeye salmon vulnerability score
from subsection (4) of this section;

(6) If spilled oil enters a river mouth, SAVS_i from subsection (4) of this section shall be assigned a score of 5 for each species/year class in peak occurrence in a river mouth during the period of time the spilled oil enters and remains in the river mouth. Scores of 5 determined for species/year classes under this subsection shall supersede SAVS_i scores calculated under subsection (4) of this section. The RDA committee shall make determinations of whether oil enters a river mouth and whether species/year classes are in peak occurrence when spilled oil is present in a river mouth.

(7) The final SAVS_s score is found by rounding the raw SAVS_s score calculated in subsection (5) of this section to the nearest 0.01 as follows: Decimals less than 0.005 shall be rounded down and decimals equal to or greater than 0.005 shall be rounded up.

(8) The final salmon vulnerability score for a spill shall be multiplied by 1.5 when any number of individuals of state or federal threatened or endangered salmon races and/or runs are exposed to spilled oil.

[Statutory Authority: Chapter 90.48 RCW. WSR 92-10-005 and 92-13-083 (Order 91-13 and 91-13A), § 173-183-450, filed 4/23/92 and 6/16/92, effective 5/24/92 and 7/17/92.]

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