

Table 1. Water temperature evaluation criteria to assess proposed targets (ODFW) on the North Santiam River for spring Chinook salmon.

Use	Date Range	Impact Type	criteria (°C)	criteria (°F)	Reference
Migration	May-01 to Jul-15	delay	< 11.1	< 52.0	From sub-group, based on run timing and temperature
Holding	May-01 to Sep-15	extreme	> 19.5	> 67.1	Approximate maximum 'upstream mix' calculation downstream of Dexter (see below). Keefer et al. (2010) report adult stress at ~18-19 °C and above.
Holding	May-01 to Sep-15	sub-optimal	> 16.0	> 60.8	ODEQ core cold water criteria
Spawning	Sep-01 to Oct-15	extreme	> 15.6	> 60.1	Same as incubation
Spawning	Sep-01 to Oct-15	sub-optimal	> 13.0	> 55.4	NFMS comment on 30% report; ODEQ spawning criteria
Incubation	Sep-01 to Dec-31	extreme	> 15.6	> 60.1	From sub-group, based on experimentation (Taylor and Garletts, 2007)
Incubation	Sep-01 to Dec-31	sub-optimal	> 10.1	> 50.2	NFMS comment on 30%
Incubation	Sep-20 plus 1750 ATUs	early emergence	na	na	Standard reporting metric in Willamette River annual water quality report (USACE 2014) based on average Willamette Hatchery data.
Rearing	All year	sub-optimal	>18	>64	USEPA 2003
Rearing	All year	extreme	>20	>68	Approaching lethal temperatures, high disease risk, USEPA 2003

Table 2. Water temperature evaluation criteria to assess proposed targets (ODFW) on the North Santiam River for winter steelhead.

Use	Date Range	Impact Type	criteria (°C)	criteria (°F)	Comments/Reference
Migration	Feb 1-Mar 31	sub-optimal	>16	>60.8	WDOE 2002
Migration	Feb 1-Mar 31	extreme	>20	>68	WDOE 2002
Spawning	Mar 1-May 31	sub-optimal	>10	>50	Sharpe (unpublished data), WDOE 2002, USEPA
Spawning	Mar 1-May 31	extreme	>15	>59	Sharpe (unpublished data), WDOE 2002
Incubation	Mar 1-Jun 30	sub-optimal	>10	>50	WDOE 2002, USEPA 2001
Incubation	Mar 1-Jun 30	extreme	>15	>59	WDOE 2002
Incubation	Apr 20 plus 1000 ATUs	late emergence	na	na	Estimated emergence dates TBD, Keefer and Caudill 2010
Rearing	All year	sub-optimal	>18	>64	USEPA 2003
Rearing	All year	extreme	>20	>68	Approaching lethal temperatures, high disease risk, USEPA 2003