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50 | Sharpe (unpublished data), WDOE 2002, USEPA |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59 | Sharpe (unpublished data), WDOE 2002 |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 |