

**APPENDIX I - Temperature Monitoring Data and Evaluation of Relevant Criteria
for Belshaw Creek within the Mt. Vernon Allotment**

Stream temperature is an important factor affecting distribution and abundance of salmonids within the Subbasin. Water temperatures influence water chemistry, as well as every phase of salmonid life history. Optimal temperatures for steelhead are 50° to 61° F (10° to 16° C), and the lethal temperature is approximately 77° F (25° C). Within the Upper Mainstem John Day River, high stream temperatures occur near the end of July or the beginning of August and coincide with low stream flows and warm daytime temperatures. By the end of August, stream temperatures are typically dropping.

A variety of water temperature standards/desired conditions/criteria are addressed by the MNF when designing land management actions and evaluating their effects. They are described below.

Current Condition & Forest Plan Standards & Guidelines

The Forest Plan water temperature standard and RMO directs the Forest to meet state water quality standards and prevent measurable increases in water temperature (1990 Forest Plan Watershed S&G-2, 1995 PACFISH Water Temperature RMO), and maintain maximum water temperatures below 64°F within migration and rearing habitat and below 60°F within spawning habitats (PACFISH). The Forest Plan Watershed Standards and Guidelines are:

2. Water Quality Standards and BMP's. Meet Water Quality Standards for waters of the States of Oregon (Oregon Administrative Rules, Chapter 340-41) and Idaho through planning, application, and monitoring of Best Management Practices (BMP's) in conformance with the Clean Water Act, regulations, and federal guidance issued there to.

7. Stream Temperatures. Prevent measurable temperature increases in Class I Streams. Temperature increases on SMU Class II (and fish bearing Stream Management Unit Class III) streams will be limited to the criteria in State standards. Temperatures on other streams may be increased only to the extent that water quality goals on downstream, fish-bearing streams will still be met. Normally, stream shade management on Class III streams will differ little from treatment on Class II streams

Oregon State Water Quality Standards

In addition to meeting the Forest Plan standard, the Forest must meet Oregon water quality standards under the Clean Water Act. EPA approved new water quality standards for Oregon in March 2004. Streams in the aquatic effects analysis are considered “salmon and trout rearing and migration habitat” for Oregon water temperature standards. Therefore, the following water temperature standard applies:

The seven-day-average maximum temperature of streams identified as having salmon and trout rearing and migration use; may not exceed **17.8** degrees Celsius (**64.4** degrees Fahrenheit).

Amendment 29 DFC

1. Chinook and/or Westslope cutthroat trout spawning & rearing habitat - 7 Day Mean Max 55°F (12.8°C)
2. All other John Day Basin streams – 7 Day Mean Max 64°F (17.8°C) - *Amendment 29 specifies DFCs for temperature to result in compliance with Oregon State Water Quality Standards, including instantaneous reading at any time of less than 68°F (20°C) in all anadromous streams without Chinook, bull trout, or Westslope cutthroat trout spawning*

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and rearing habitat. This water quality standard has been revised since Amendment 29 was issued, thus the revised standard is applied.

PACFISH RMO

1. No measurable increase in 7 Day Mean Max – *MNF data insufficient to determine whether this RMO is being met.*
2. Migration & rearing habitat - 7 Day Mean Max Below 64°F (17.8°C)
3. Spawning habitat - 7 day Mean Max Below 60°F (15.6°C)

Matrix of Pathways and Indicators:

STEELHEAD (S)

1. Functioning Appropriately (FA): 7 Day Mean Max 50-57°F (10-13.9°C)
2. Functioning At Risk (FAR): 7 Day Mean Max - Spawning habitat 57-61°F (13.9-16.1°C), Migration & rearing habitat 57-64°F (13.9-17.8)
3. Functioning At Unacceptable Risk (FAUR): 7 Day Mean Max - Spawning habitat >61°F (16.1°C), Migration & rearing habitat >64°F (17.8°C)

Table I-1 presents water temperature monitoring data for Belshaw Creek in the Belshaw Pasture of the Mt. Vernon Allotment for years 1997-2001. The table also displays whether or not the temperature data meets or fails to meet each standard described above: 1) State water quality standards; 2) Amendment 29 DFC; 3) PACFISH RMO; and, 4) NMFS MPI. The location of the Belshaw Creek temperature monitoring site is displayed in Figure I-1.

The mean yearly maximum of seven day rolling means of the daily maximum in degrees Fahrenheit (7 day mean max) was 63.2 degrees. The mean number of days per year over 64 degrees F was two.

The state water quality standard of the seven-day mean maximum temperature of 64 degrees F for streams with anadromous fish passage and salmonid rearing use *was met*. The Amendment 29 DFC for Chinook salmon and/or Westslope cutthroat trout spawning and rearing habitat of seven day mean maximum of 55 degrees F was *not met*, but the requirement for compliance in all other John Day Basin streams with state water quality standards *was met*.

The PACFISH RMO has three criteria. There was insufficient data to determine if there has been no measurable increase in the seven day mean maximum (criterion 1). Criterion 2, seven-day mean maximum below 64 degrees F for migration and rearing habitat, *was met*. Criterion 3, seven-day mean maximum below 60 degrees F for spawning habitat, *was not met*. The data supported a NMFS MPI rating of NPF (seven day mean maximum >61 degrees F for spawning habitat; >64 degrees F for migration and rearing habitat).

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Table I-1. Temperature monitoring data and evaluation of relevant criteria for Belshaw Creek within the Mt. Vernon Allotment

Stream	Pasture	Years Analyzed	Mean Yearly Max of 7 Day Rolling Means of Daily Max (°F) (7 Day Mean Max)	Daily Max Over 64°F (Mean Days Per Year)	State Water Quality Standards (Meet/Fail)	303d Listed (Y/N)	Amendment 29 DFC (Meet/Fail)	PACFISH RMO (Meet/Fail)	MPI (FA, FAR, FAUR)
Belshaw Cr	Belshaw	1997-2001	63.2	2	Meet	N	Fail 1 Meet 2	Meet 2 Fail 3	FAUR S

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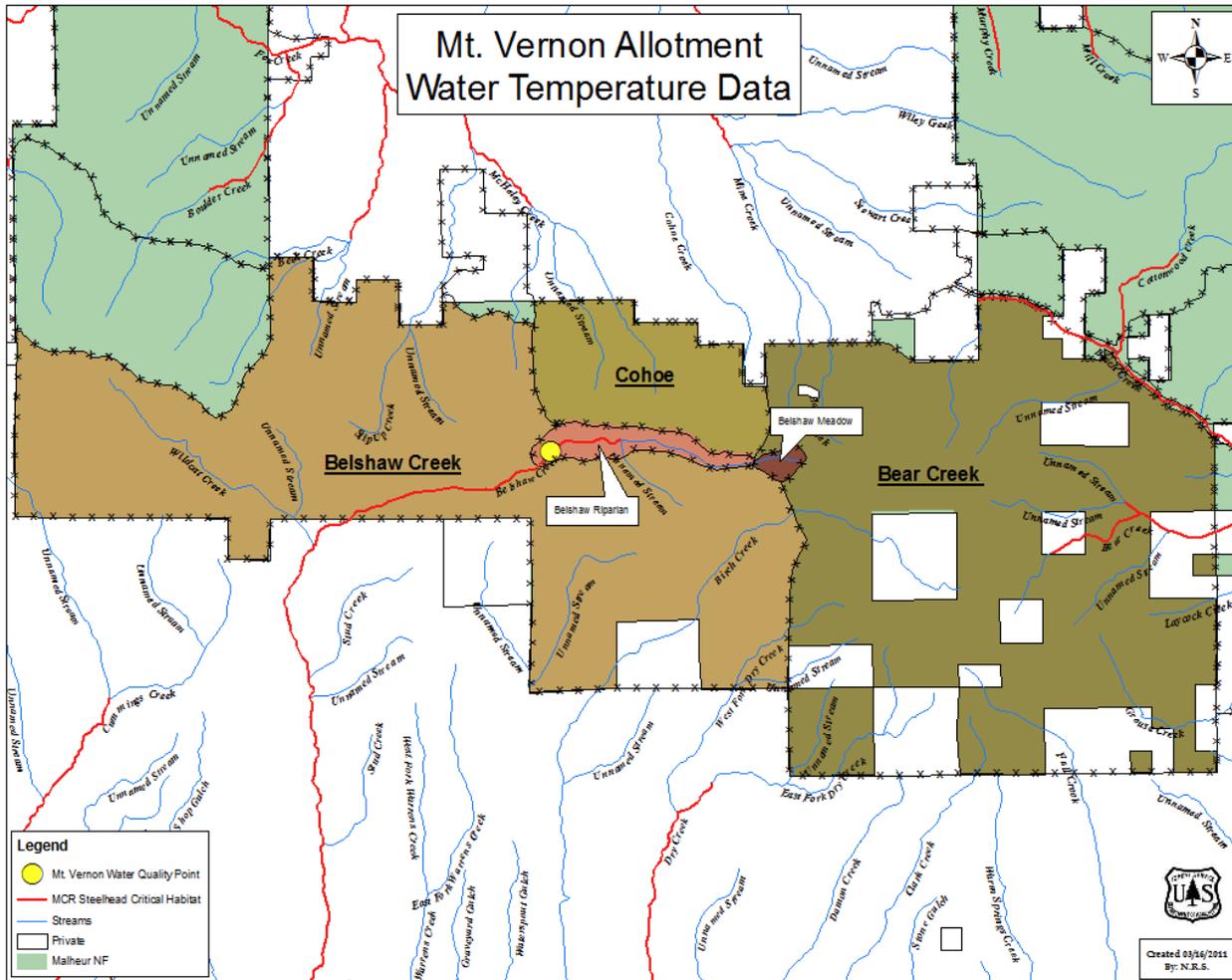


Figure I-1. Location of Belshaw Creek temperature monitoring site.