

APPENDIX F: TUALATIN RIVER SUBBASIN FISH HABITAT AND FISH COMMUNITY INFORMATION

INTRODUCTION

The intent of this document is to serve as an aid in interpreting the dissolved oxygen and temperature water quality criteria in the Tualatin River Subbasin. In order to do this, stream segments within the subbasin with designated beneficial uses associated with salmonid habitat and cold-, cool- and warm-water communities must be identified. The beneficial use of salmonid habitat is focused upon since it may require the application of the most stringent criteria for temperature and dissolved oxygen. In addition to this, winter steelhead in the Upper Willamette (including the Tualatin River Subbasin) have been listed as a threatened species under the federal Endangered Species Act. It is important that the TMDLs address the water quality impacts on these species. Stream segments with the potential to support cold-, cool- and warm-water communities are important because they further delineate the applicable dissolved oxygen criteria.¹

It should be noted that this paper is not intended to specifically delineate reaches needing protection under the Endangered Species Act. Since both native and non-native species may be included in the protection of salmonid habitat through water quality standards, the salmonid habitats identified below may include native and non-native species. It should also be noted that the knowledge base related to salmonids in the subbasin is still evolving and that the information given below may change as new data are collected.

All of the following information was gathered in cooperation with the Oregon Department of Fish and Wildlife (ODFW). The final determination of potential salmonid distribution and aquatic community structure was made by DEQ staff.

SALMONID HABITAT DISTRIBUTION

In regard to the application of water quality criteria, the main purpose of examining salmonid habitat distribution is to determine the stream segments and primary times when salmonid spawning, incubation and fry emergence occur. At these locations and times more stringent water temperature and dissolved oxygen criteria apply.

For dissolved oxygen, the pertinent Oregon Administrative Rule (OAR) that applies is (in part) OAR 340-041-0445(2)(a):

- (A) *For waterbodies identified by DEQ as providing salmonid spawning, during periods from spawning until fry emergence from the gravels, the following criteria apply:*
 - (i) *The dissolved oxygen shall not be less than 11.0 mg/L. However, if the intergravel dissolved oxygen, measured as a spatial median, is 8.0 mg/L or greater, then the DO criterion is 9.0 mg/L.*

This DO criterion of 11.0 mg/L is significantly higher than the criteria of 8.0 mg/L and 6.5 mg/L required of non-spawning cold- and cool-water habitat (see discussion in next section).

¹ Information on the relationship between habitat, communities and the applicable criteria are included in the dissolved oxygen and temperature sections of the TMDL document.

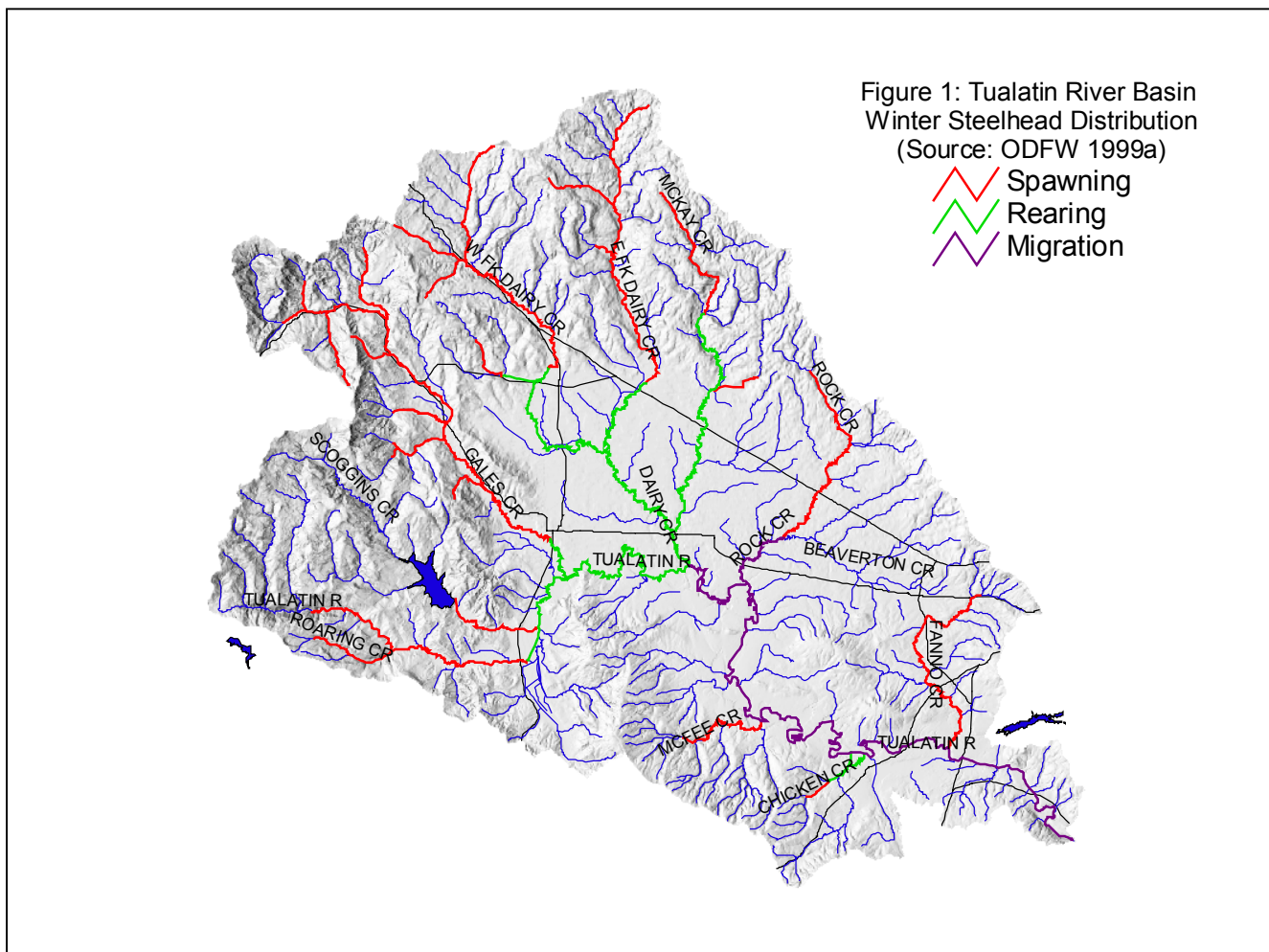
For water temperature, OAR 340-041-0445(2)(b) is applicable:

- (A) *To accomplish the goals identified in OAR 340-041-0120(11), unless specifically allowed under a Department-approved surface water temperature management plan as required under OAR 340-041-0026(3)(a)(D), no measurable surface water temperature increase resulting from anthropogenic activities is allowed:*
- (iv) *In waters and periods of the year determined by the Department to support native salmonid spawning, egg incubation, and fry emergence from the egg and from the gravels in a basin which exceeds 55.0°F (12.8°C);*

This criterion is also significantly more stringent than the 64°F (17.8°C) criterion which applies to waters where salmonid fish rearing and migration, but no salmonid spawning, is a designated beneficial use. (Note that the same criterion apply for rearing and migration stream segments.)

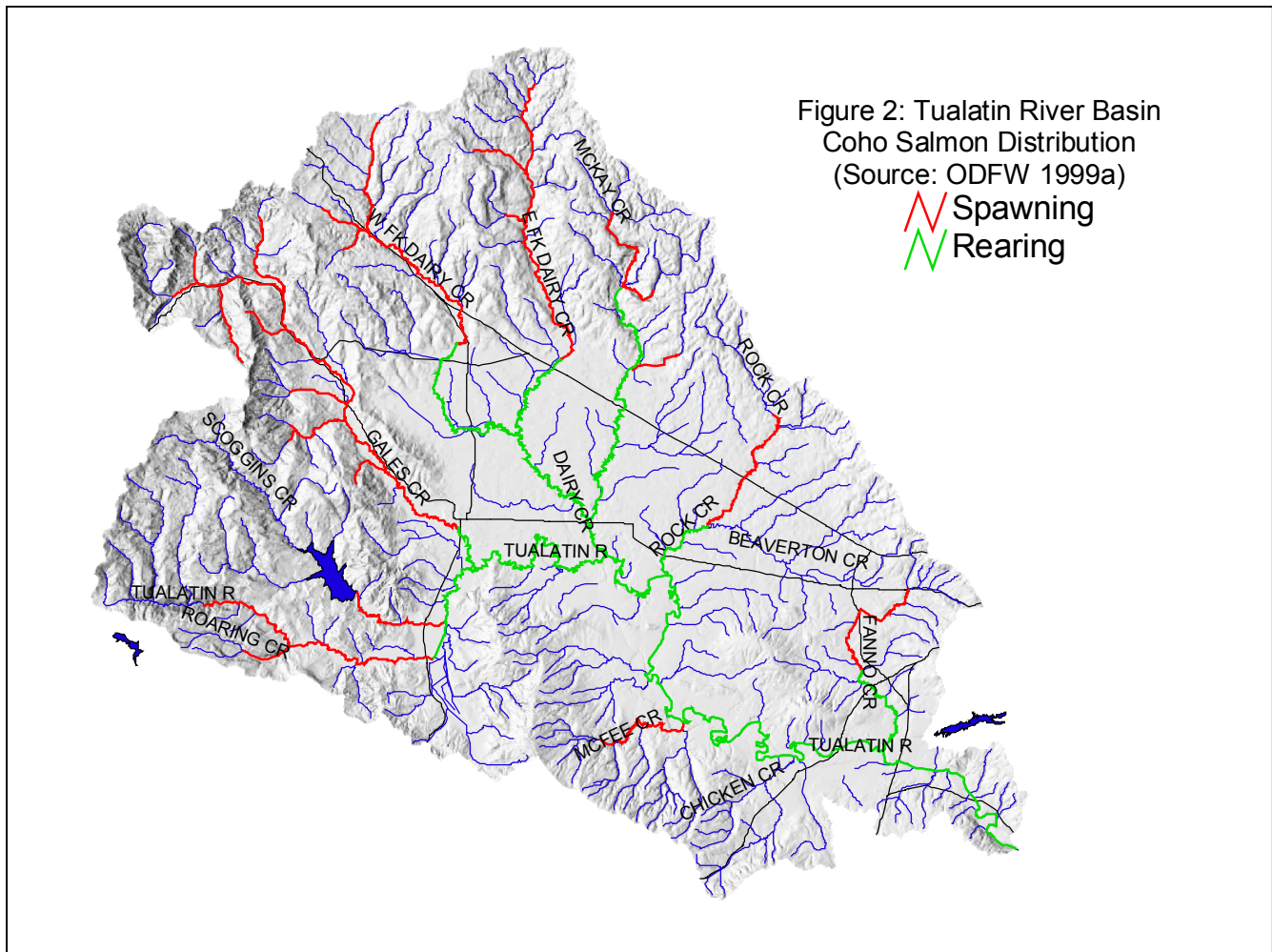
STEELHEAD

The steelhead habitat distribution information came from drafts of ODFW's 1999 distribution maps. This distribution map (Figure 1) is an update of earlier maps and includes habitat information obtained from an analysis of a 1995 ODFW fish study (ODFW, 1995) and the best professional judgement of ODFW biologists. The dates generally supporting steelhead critical life stages in the subbasin are included in Figure 4.



COHO SALMON

The habitat distribution information for coho salmon also came from drafts of ODFW's 1999 distribution maps and is presented in Figure 2. The dates generally supporting coho critical life stages in the subbasin are included in Figure 4.



CUTTHROAT TROUT

Since no habitat distribution map existed for cutthroat trout in the Tualatin River Subbasin, a new map was developed using information from the 1995 ODFW study (ODFW, 1995), the 1992 ODFW Fish Management Plan (ODFW, 1992), and the best professional judgement of DEQ and ODFW biologists. The Cutthroat habitat distribution map is presented in Figure 3. The dates generally supporting Cutthroat critical life stages in the subbasin are included in Figure 4. Searun (anadromous) cutthroat are not known to occur in the Tualatin River (ODFW, 1992).

CHINOOK SALMON

The Tualatin River Subbasin is not considered by ODFW's District Biologist to include chinook salmon spawning habitat. Any possible Chinook habitat in the subbasin would be for rearing and/or migration. Since rearing and/or migration are designated beneficial uses throughout the subbasin for other salmonid species, water quality criteria protecting this habitat are already applied to all stream segments in the subbasin.

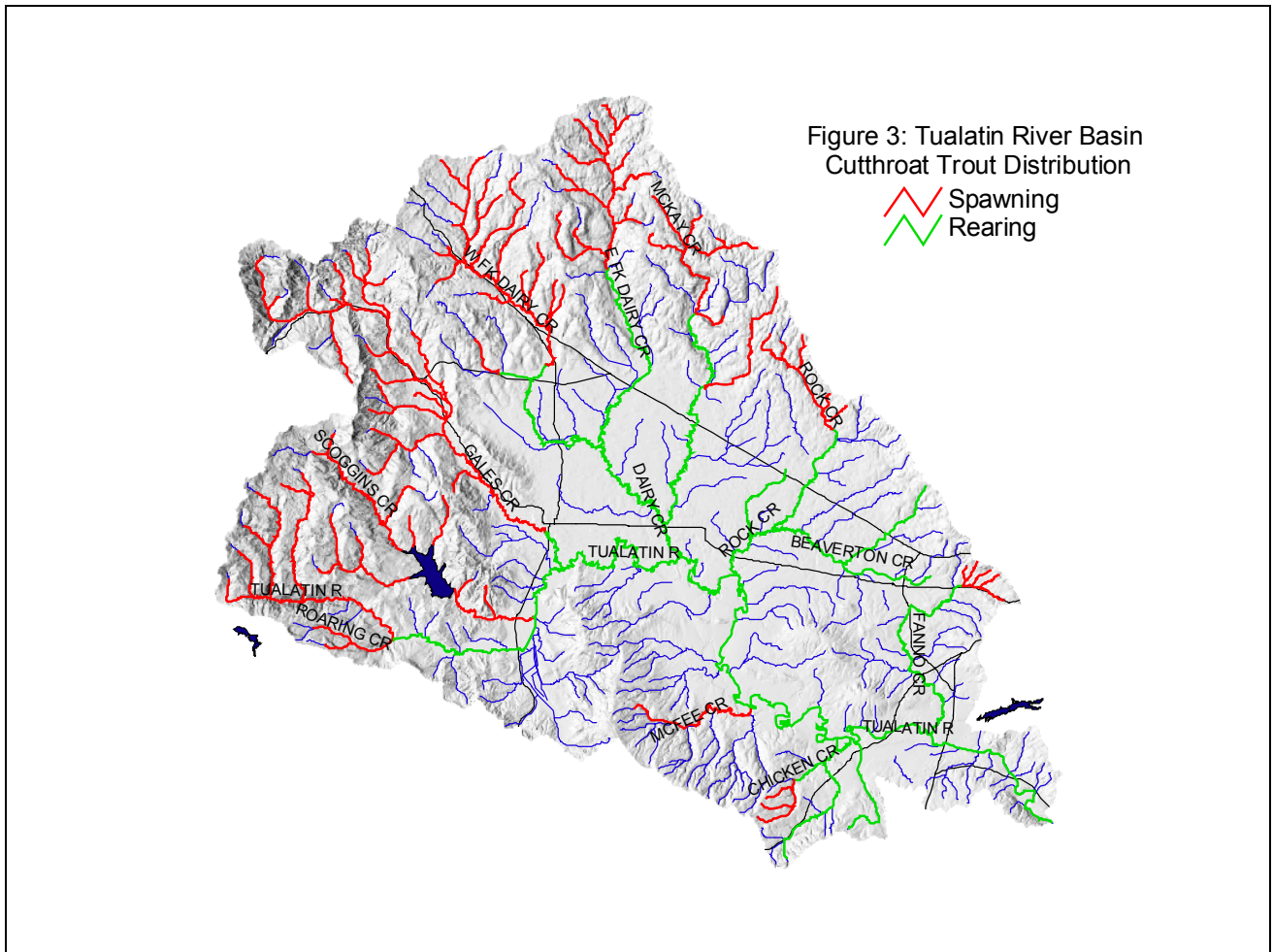


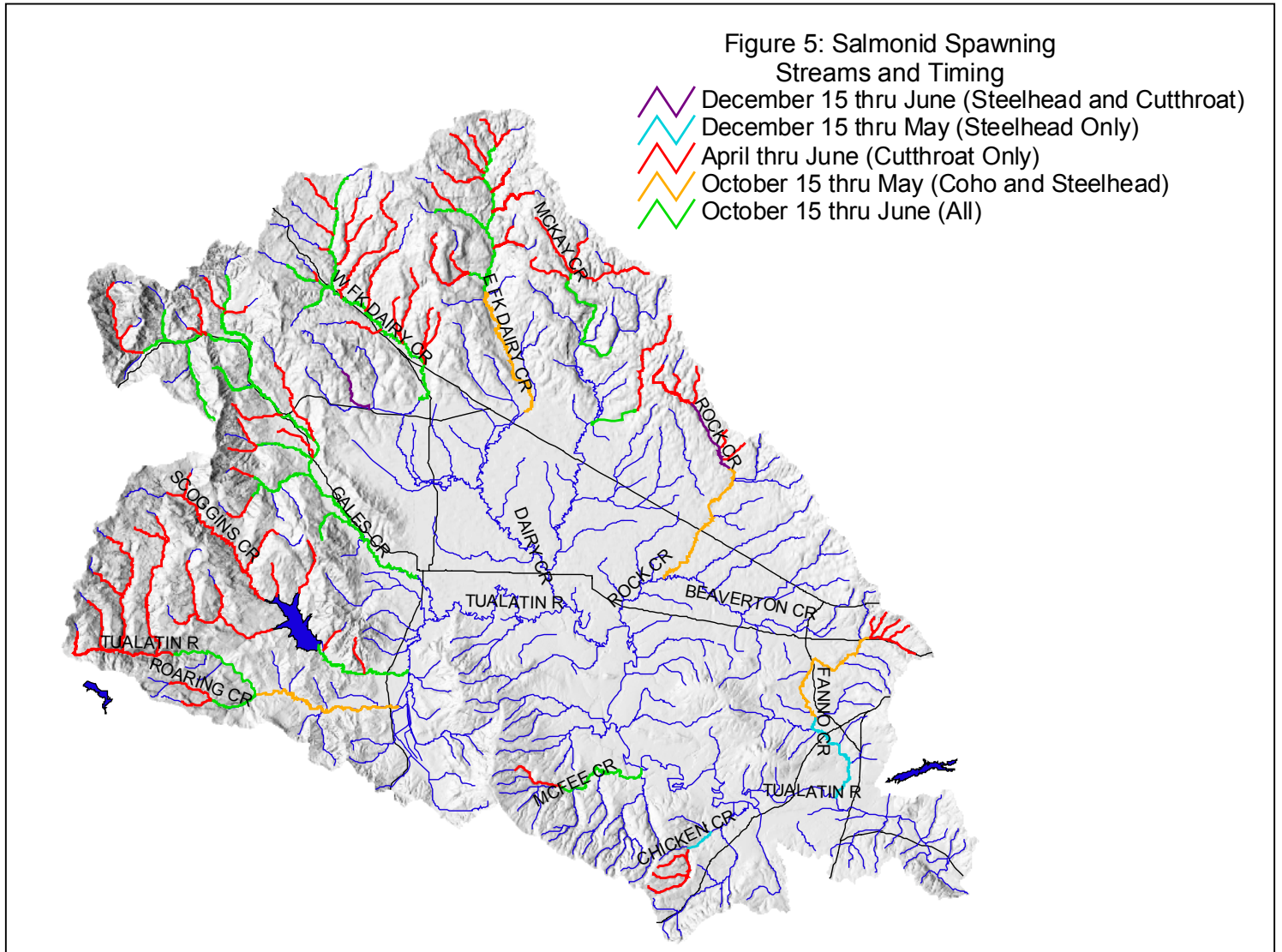
Figure 4: Tualatin River Subbasin Salmonid Life Stage Timing (Source: ODFW 1999b)

| Species and Life Stages | Oct. | Nov. | Dec. | Jan. | Feb. | March | April | May | June |
|-----------------------------------------|------|------|------|------|------|-------|-------|-----|------|
| Winter Steelhead | | | | | | | | | |
| Spawning, incubation and fry emergence* | | | | | | | | | |
| Coho | | | | | | | | | |
| Spawning, incubation and fry emergence* | | | | | | | | | |
| Cutthroat | | | | | | | | | |
| Spawning, incubation and fry emergence* | | | | | | | | | |

* This is the time period pertinent to DEQ's temperature and DO criteria

GENERAL SALMONID SPAWNING HABITAT

The stream segments and seasons supporting salmonid spawning, incubation and fry emergence were determined by combining the spatial spawning information (**Figures 1 through 3**) with the temporal spawning information (**Figure 4**) for all salmonid species spawning in the subbasin. These stream segments and times are shown in **Figure 5**.



Aquatic Communities

As mentioned above, for stream segments and seasons when salmonid spawning occurs, the dissolved oxygen criterion of 11.0 mg/L is applied. In order to determine appropriate dissolved oxygen criteria for stream segments and/or seasons not designated for salmonid spawning habitat, a determination of appropriate community structure is necessary. The stream segments identified by the department as providing cold-, cool-, or warm-water aquatic life, or salmonid spawning are assigned specific dissolved oxygen criteria.

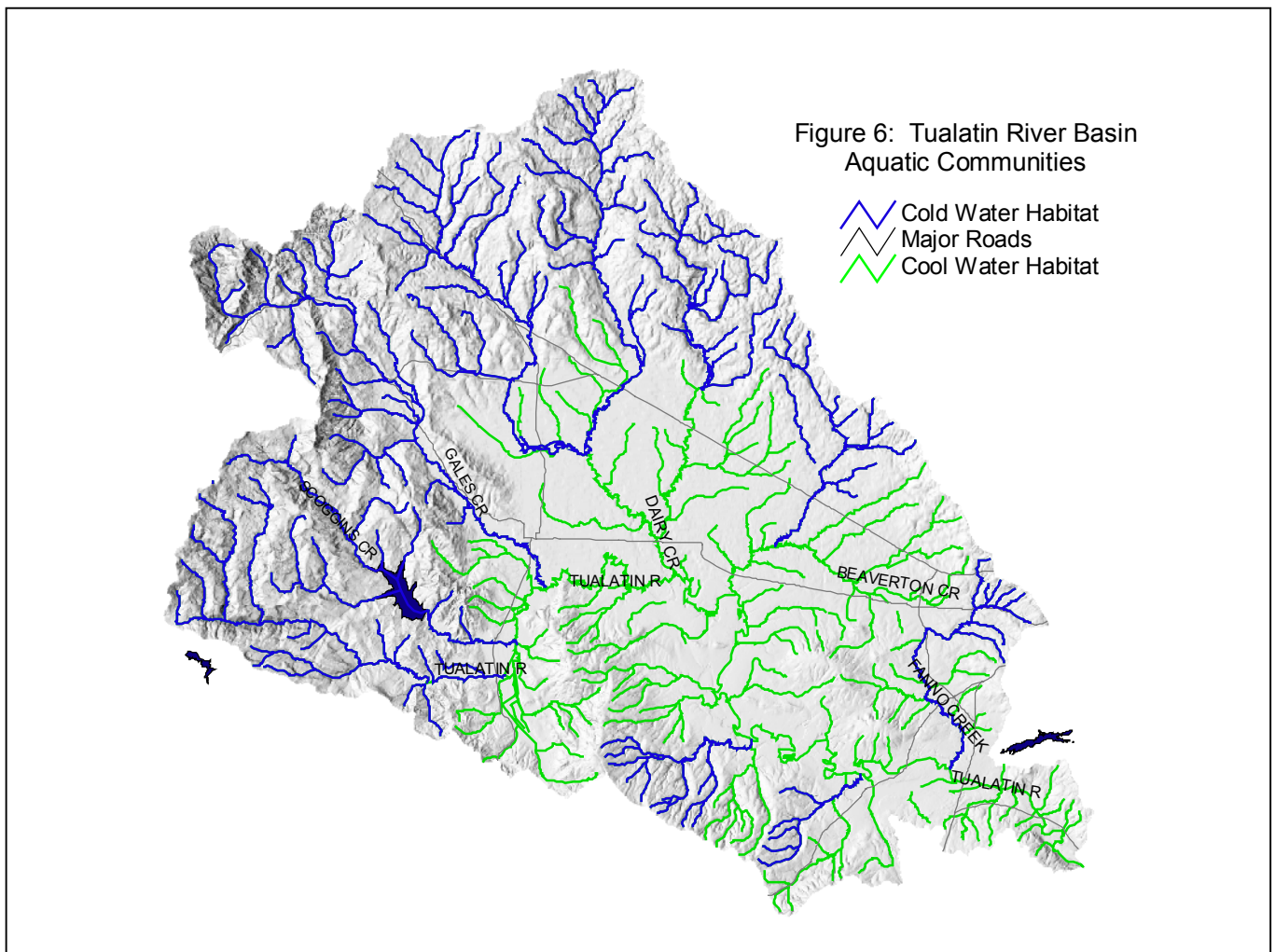
Cold-, cool-, and warm-water aquatic life are defined in Oregon Administrative Rule (OAR) 340-041-0006 as follows:

(51) “Cold-Water Aquatic Life” – The aquatic communities that are physiologically restricted to cold water, composed of one or more species sensitive to reduced oxygen levels. Including but not limited to Salmonidae and cold-water invertebrates.

(52) “Cool-Water Aquatic Life” – The aquatic communities that are physiologically restricted to cool waters, composed of one or more species having dissolved oxygen requirements believed similar to the cold-water communities. Including but not limited to Cottidae, Osmeridae, Acipenseridae, and sensitive Centrarchidae such as the small-mouth bass.

(53) “Warm-Water Aquatic Life” – The aquatic communities that are adapted to warm-water conditions and do not contain either cold- or cool-water species.

Based on available fish survey information, habitat assessments and professional judgement, DEQ, with input from ODFW staff, has identified the stream segments denoted in **Figure 6** as supporting cold- and cool-water aquatic life. Since all stream segments within the subbasin may contain cold- or cool-water species, no segments were identified as supporting only warm-water aquatic life. For stream segments and seasons identified in **Figure 5** as supporting salmonid spawning, the appropriate dissolved oxygen criteria will apply.



REFERENCES CITED

ODFW (Oregon Department of Fish and Wildlife), 1992, *Tualatin River Subbasin Fish Management Plan*.

ODFW (Oregon Department of Fish and Wildlife), 1995, *Distribution of Fish and Crayfish and Measurement of Available Habitat in the Tualatin River Basin, Final Report of Research*.

ODFW (Oregon Department of Fish and Wildlife), 1999, Geographic Information System (GIS) fish distribution overlays.

ODFW (Oregon Department of Fish and Wildlife), 1999b, personal communication with Tom Friesen.

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