

# Section 10 - References

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**APPENDIX A**  
**Fifteenmile Creek: Analysis**  
**of Seasonally Varying Flows,**  
**Provided by ODFW**

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## Fifteenmile Creek: analysis of Seasonally Variable Flows

### Background

The Fifteenmile Watershed Council has received a WRD 1069 grant to study the feasibility of a storage project on Fifteenmile Creek. The proposed project would divert water during the storage season (approximately November – April 14 depending on availability) using an existing diversion point and ditch at about RM 45. Diverted water would be conveyed to a reservoir at one of three potential sites between RM 30-33. This stored water will be provided to irrigators. In return, a portion (25%) of the live flow that is presently diverted during the irrigation season will remain instream and be protected from diversion all the way to the mouth of Fifteenmile Creek during irrigation season.

SB 1069 can be used to fund analyses of bypass, peak, flushing and other ecological flows for the planning phase of water storage projects. SB 839 requires the establishment of Seasonally Varying Flows (SVF), and for projects seeking funding under SB 839 has the requirement that 25% of the stored water be dedicated instream. This paper outlines the flow targets and the types of studies that will be needed to comply with the SVF requirements of SB 839. Details on regulation of the amount and timing of summer instream flows are another key part of the project, and will need to be worked out separately.

### Fishery concerns:

- Steelhead upstream migration, spawning, incubation, rearing, and downstream migration.
- Pacific Lamprey spawning and incubation.

Storage and irrigation periods: There are no official seasons for Fifteenmile Creek. The likely periods are:

Storage: November 1 – April 14      Irrigation: March 1 – October 31

### Seasonally Varying Flow requirements

SVF's include base flows for basic physical habitat needs, as well as higher flows for channel maintenance, habitat connectivity, upstream and downstream migration, and other functions. Because of the natural hydrograph and storage season, and due to the Division 33 restrictions for water withdrawals without mitigation between April 15 and September 30), we are considering SVF needs from November – mid April only.

### Bypass flows (base flows)

Base flows are needed for fish persistence: to protect water instream for basic life cycle needs. Base flows are typically set by instream water rights (ISWR) and/or recommended flows from the Basin Investigation Reports (BIR) and/or appropriate instream flow studies.

To avoid dewatering the upstream portion of Fifteenmile Creek above Ramsey Creek, two compliance points will be needed to assure base flows are met in Fifteenmile Creek during the storage season. The upstream compliance point should be between the POD (approximately RM 44) and Ramsey Creek (approximately RM 36). The target flow here (Table 1) is the instream water right (ISWR). These two compliance points will also be needed during the irrigation season to make sure that water dedicated instream remains instream for fish.

Table 1. Base flow targets for Fifteenmile Creek between POD and Ramsey Creek.

month	*Target flow (cfs)
JAN	4
FEB	4
MAR	13
APR**	20
MAY	20
JUN	20
JUL	13
AUG	13
SEP	4
OCT	4
NOV	4
DEC	4

\*Target flows are equal to the instream water right IS-70262. \*\*Shaded months are outside the likely storage season.

The downstream compliance point should be above Eightmile Creek, at about RM 2. The target flow here is based on the BIR optimum flow, or the WRD estimated natural median flow, whichever is less (Table 2). The target flow is greater than the ISWR in several months. This is because the ISWR is a converted Minimum Perennial Streamflow (MPSF) which was based on the BIR minimum flow. Other ISWR's in the basin, which are not converted MPSF, were based on the Optimum BIR values (example- the two ISWR's on Eightmile Creek).

Table 2. Base flow targets for Fifteenmile Creek above Eightmile Creek

month	BIR minimum (ISWR)	BIR optimum	WRD estimated median	Target flow, cfs
JAN	4	13	65.7	13
FEB	4	13	102	13
MAR	13	20	97.5	20
APR	20	34	66.9	34
MAY	20	34	65.6	34
JUN	20	34	49.8	34
JUL	13	20	12.8	12.8
AUG	13	20	5.9	5.9
SEP	4	13	6.1	6.1
OCT	4	13	7.9	7.9
NOV	4	13	11.3	11.3
DEC	4	13	24.7	13

### Migration flows

Steelhead migration: March is the peak period for adult steelhead upstream migration. April is an important month for juvenile steelhead outmigration. ODFW will recommend no diversion from March 1-April 14 to assist upstream and downstream migration.

Division 33: No diversion (without mitigation) is allowed from April 15 to September 30 due to Division 33 rules for the Columbia River above Bonneville Dam.

### Channel maintenance flows

The Applicant should calculate a channel maintenance flow for Fifteenmile Creek. The magnitude and duration of the channel maintenance flow can be developed using the Robison (2007) guidance. The Applicant will need to base channel maintenance flows on stream gradient, predominant substrate, and estimates of naturally occurring high flows (in the 1 to 3 year recurrence interval range).

A channel maintenance flow should be calculated for at least one of the two points mentioned in the Base Flow section. When flow at the relevant compliance point reaches the channel maintenance level, diversion must stop. The flow range at which diversion should stop, and the duration of the stoppage, need to be evaluated by the Applicant in consultation with ODFW and OWRD.

### **Other ecological flows: connectivity**

Steelhead rearing in Fifteenmile Creek depends on side channel habitat. An inventory of potential side channel habitats in selected reaches of Fifteenmile Creek is needed to identify key areas. Magnitude, timing, and duration of flows needed to water up key side channels should be calculated in consultation with ODFW.

### **Other issues**

Improved flows during the irrigation season (~April-October) are a potentially valuable benefit to the fishery and a major component of the Fifteenmile storage project. The basic premise is that in return for access to stored water in the new reservoir, a live-flow amount equal to 25% of the stored water will be protected instream.

Assuming for discussion that 4300 acre-ft. will be stored, 1075 acre-ft. will go instream. There are at least two ways this can be accomplished.

-Part of an existing senior irrigation right can be transferred instream. The amount transferred instream will have a maximum duty of 1075 acre-ft., and monthly rates would need to be set to provide flow throughout the irrigation season, but would not exceed those of the irrigation right. The transfer would be permanent.

-Holders of senior water rights could lease water instream each year. As above, the rate and duty of the leased water would need to conform to the irrigation right it is derived from. The lease would need to be redone on an annual basis.

In either case, the seniority of the irrigation right is a key factor in making the project feasible.

Natural inflow will enter the reservoir from the upstream drainage area. Alteration of this flow volume and timing will need to be evaluated for possible fishery effects between the reservoir outlet and Fifteenmile Creek. Any fish issues in the tributary creek/drainage between the reservoir and Fifteenmile Creek will need to be addressed. A separate water right, with fish conditions, may be needed.

Fish Screening and Passage. Fish passage may need to be addressed with regard to the upstream drainage area. Fish screening will need to be evaluated and addressed if needed for the withdrawal point on Fifteenmile creek. For example, steelhead are present in Pine Creek downstream of the proposed reservoir site.

### **Summary**



November-February: Storage allowed subject to SVF's, including base flows, channel maintenance, and connectivity flows

March 1-April 14: Recommend no storage, to protect SVF's for steelhead migration.

April 15-September 30: Water not available unless mitigation water is provided as required by Division 33

October: Still in irrigation season, very little storage available, so likely closed for all practical purposes.

**APPENDIX B**  
**Fifteenmile Creek Water Rights**  
**by Priority Date**

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## Appendix B: Fifteenmile Creek Water Rights by Priority Date

\*Dark line denotes priority date after which there is little benefit to protecting water in stream.

Certificate/ Transfer	Priority Year	Acres	Pipe	Rate (cfs at 1/80)	Duty (acre- feet)	Running Total Reservoir Volume (acre-feet)	Potential Running Total In-stream Benefit (cfs)
75934	1856	10.5	Yes	0.13	31.5	31.5	0.13
64753	1856	123.8	Yes	1.55	371.4	402.9	1.68
5635	1858	15	No	0.19	45	402.9	1.49
35282	1858	28.9	No	0.36	86.7	402.9	1.13
48199	1860	82.2	Yes	1.03	246.6	649.5	2.16
T-3704	1860	18.8	Yes	0.24	56.4	705.9	2.39
T-3704	1860	77	Yes	0.96	231	936.9	3.36
5674	1860	44.88	Yes	0.56	134.6	1071.54	3.92
T-6825	1861	10.6	Yes	0.13	31.8	1103.34	4.05
48907	1861	60.5	Yes	0.76	181.5	1284.84	4.80
T-9565	1861	22	Yes	0.28	66	1350.84	5.08
5674	1862	28.87	Yes	0.36	86.61	1437.45	5.44
50936	1863	3	Yes	0.04	9	1446.45	5.48
50936	1863	73.1	Yes	0.91	219.3	1665.75	6.39
T-6825	1866	5.5	Yes	0.07	16.5	1682.25	6.46
T-6825	1867	2	Yes	0.03	6	1688.25	6.49
T-6825	1867	5	Yes	0.06	15	1703.25	6.55
T-6825	1867	25.9	Yes	0.32	77.7	1780.95	6.87
46651	1869	18.5	No	0.23	55.5	1780.95	6.87
46636	1869	2.5	No	0.03	7.5	1780.95	6.87
46635	1869	11.5	No	0.14	34.5	1780.95	6.87
5604	1869	25.94	No	0.32	77.82	1780.95	6.87
5604	1869	3.3	No	0.04	9.9	1780.95	6.87
5678	1869	41.32	No	0.52	124	1780.95	6.87
5628	1870	9.8	No	0.12	29.4	1780.95	6.87
44332	1872	1.2	No	0.02	3.6	1780.95	6.87
40409	1872	30.3	No	0.38	90.9	1780.95	6.87
5670	1873	2.8	No	0.04	8.4	1780.95	6.87
5671	1873	3	No	0.04	9	1780.95	6.87
48199	1873	49.93	Yes	0.62	149.8	1930.74	6.87
5641	1875	16.4	No	0.21	49.2	1930.74	6.87
5636	1875	11.3	No	0.14	33.9	1930.74	6.87
4668	1878	4	No	0.05	12	1930.74	6.87
48318	1879	5	No	0.06	15	1930.74	6.87
55642	1883	9.15	No	0.11	27.45	1930.74	6.87
64753	1885	24.4	Yes	0.31	73.2	2003.94	6.87
55641	1885	8	Yes	0.10	24	2027.94	6.87
5643	1888	8.5	No	0.11	25.5	2027.94	6.87

<b>Certificate/ Transfer</b>	<b>Priority Year</b>	<b>Acres</b>	<b>Pipe</b>	<b>Rate (cfs at 1/80)</b>	<b>Duty (acre- feet)</b>	<b>Running Total Reservoir Volume (acre-feet)</b>	<b>Potential Running Total In-stream Benefit (cfs)</b>
5674	1893	9.36	Yes	0.12	28.08	2056.02	6.87
55642	1896	20.4	No	0.26	61.2	2056.02	6.87
55642	1900	2.3	No	0.03	6.9	2056.02	6.87
5603	1907	17	No	0.21	51	2056.02	6.87
49825	1907	10.6	No	0.13	31.8	2056.02	6.87
46635	1907	6.6	No	0.08	19.8	2056.02	6.87
48199	1908	7.2	Yes	0.09	21.6	2077.62	6.87
44118	1909	12	No	0.15	36	2077.62	6.87
T-6825	1911	39	Yes	0.49	117	2194.62	6.87
T-6825	1912	30	Yes	0.38	90	2284.62	6.87
47970	1912	1.4	No	0.02	4.2	2284.62	6.87
47970	1912	26	No	0.33	78	2284.62	6.87
48317	1912	20	No	0.25	60	2284.62	6.87
49825	1915	12	No	0.15	36	2284.62	6.87
49826	1915	31	No	0.39	93	2284.62	6.87
45708	1916	8.72	No	0.11	26.16	2284.62	6.87
50933	1921	25.9	No	0.32	77.7	2284.62	6.87
49741	1922	5	Yes	0.06	15	2299.62	6.87
37400	1923	3	No	0.04	9	2299.62	6.87
49824	1924	55.7	No	0.70	167.1	2299.62	6.87
9476	1926	2	No	0.03	6	2299.62	6.87
9475	1926	9	No	0.11	27	2299.62	6.87
35097	1927	15	Yes	0.19	45	2344.62	6.87
44027	1929	30	No	0.38	90	2344.62	6.87
T-5406	1929	5	No	0.06	15	2344.62	6.87
19546	1939	2.2	No	0.03	6.6	2344.62	6.87
19567	1947	18.2	No	0.23	54.6	2344.62	6.87
21214	1950	23	No	0.29	69	2344.62	6.87
47971	1955	24	No	0.30	72	2344.62	6.87
T-9565	1957	25.2	Yes	0.32	75.6	2420.22	6.87
62544	1960	6.7	No	0.08	20.1	2420.22	6.87
72240	1960	1.4	No	0.02	4.2	2420.22	6.87
48692	1960	53	No	0.66	159	2420.22	6.87
32364	1961	22	No	0.28	66	2420.22	6.87
T-6825	1962	33.3	Yes	0.42	99.9	2520.12	6.87
44230	1964	37	No	0.46	111	2520.12	6.87
35601	1964	22.3	Yes	0.28	66.9	2587.02	6.87
37474	1965	19.5	Yes	0.24	58.5	2645.52	6.87
42772	1966	16	No	0.20	48	2645.52	6.87
35405	1966	14.2	No	0.18	42.6	2645.52	6.87

<b>Certificate/ Transfer</b>	<b>Priority Year</b>	<b>Acres</b>	<b>Pipe</b>	<b>Rate (cfs at 1/80)</b>	<b>Duty (acre- feet)</b>	<b>Running Total Reservoir Volume (acre-feet)</b>	<b>Potential Running Total In-stream Benefit (cfs)</b>
382941	1968	35.06	Yes	0.44	105.2	2750.7	6.87
44560	1968	38	Yes	0.48	114	2864.7	6.87
50318	1972	8.2	No	0.10	24.6	2864.7	6.87
50319	1972	0.3	No	0.00	0.9	2864.7	6.87
48992	1972	37.8	Yes	0.47	113.4	2978.1	6.87
50112	1972	9.08	Yes	0.11	27.24	3005.34	6.87
T-6825	1976	2.7	Yes	0.03	8.1	3013.44	6.87
52909	1976	34.6	Yes	0.43	103.8	3117.24	6.87
T-6825	1976	49.9	No	0.62	149.7	3117.24	6.87
T-6825	1976	39	No	0.49	117	3117.24	6.87
48690	1976	13.3	No	0.17	39.9	3117.24	6.87
48769	1976	45.6	No	0.57	136.8	3117.24	6.87
T-6825	1976	11	Yes	0.14	33	3150.24	6.87
T-6825	1976	28.5	Yes	0.36	85.5	3235.74	6.87
56541	1977	3.1	No	0.04	9.3	3235.74	6.87
55628	1977	4.13	Yes	0.05	12.39	3248.13	6.87
49296	1977	33.4	No	0.42	100.2	3248.13	6.87
67109	1977	36.3	Yes	0.45	108.9	3357.03	6.87
75935	1977	10.5	Yes	0.13	31.5	3388.53	6.87
50114	1977	36	Yes	0.45	108	3496.53	6.87
58980	1978	19.1	No	0.24	57.3	3496.53	6.87
65847	1981	10.5	No	0.13	31.5	3496.53	6.87
65847	1981	12.2	Yes	0.15	36.6	3533.13	6.87
65609	1984	41.3	No	0.52	123.9	3533.13	6.87