

Appendix V - Vaseux Creek

APPENDIX V

Okanagan Basin Water Board Okanagan Nation Alliance B.C. Ministry of Forests, Lands and Natural Resource Operations

Vaseux Creek



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APPENDIX V

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1 Introduction

The purpose of this appendix is to provide information to support the application of recommended environmental flow needs (EFN)-setting methods for Vaseux Creek following the methods outlined in the accompanying report¹. This document contains information obtained and collated by Associated Environmental Consultants Inc. (Associated) and will be revised following additional input from Okanagan Nation Alliance. A summary of current available information for Vaseux Creek is provided in Table 6-1 in the accompanying report and Table V-1 at the end of this appendix.

Section 5 in the accompanying report provides an overview of two recommended EFN-setting methods for tributaries within the Okanagan Basin, while Section 6 lists the key steps to implement each of the two methods, in both flowchart and text form.

Environmental flows have been previously recommended for Vaseux Creek by ESSA and Solander (2009) (Table 6-1 in the accompanying report).

2 Relevant Information for Setting Environmental Flow Needs

This section summarizes the information available to support EFN-setting in Vaseux Creek. Available information sources for Vaseux Creek are included within Table V-1 at the end of this appendix.

2.1 OVERVIEW OF THE WATERSHED

Vaseux Creek has a watershed area of approximately 294 km². Vaseux Creek flows from gently sloping plateau headwaters through a steep-sided canyon before discharging into the Okanagan River, south of Vaseux Lake. The main tributary to Vaseux Creek is Solco Creek. Forestry is the predominant land use within the upper watershed area, while the Bighorn National Wildlife Area is located within the lower reaches of the watershed.

The Vaseux Creek watershed is shown in Figure 1-1 in the accompanying report.

2.2 STREAMFLOWS

2.2.1 Hydrometric Data

There is currently one active Water Survey of Canada (WSC) hydrometric station within the Vaseux Creek watershed:

¹ Associated Environmental Consultants Inc. (Associated). 2016. Collaborative Development of Methods to Set Environmental Flow Needs in Okanagan Streams. Working document, Current Version. Prepared for the Okanagan Basin Water Board, Okanagan Nation Alliance, and B.C. Ministry of Forests, Lands and Natural Resource Operations. May 2016

- **Vaseux Creek Above Solco Creek** (WSC 08NM171; Drainage area: 117 km²; Natural; Period of record: 1970-Present)

In addition, historic records are available from the following hydrometric stations within the watershed:

- **Vaseux Creek Above Dutton Creek** (WSC 08NM015; Drainage area: 255 km²; Natural; Period of record: 1919-1982)
- **Vaseux Creek near the Mouth** (WSC 08NM246; Drainage area: 296 km²; Natural; Period of record: 2006-2010)

2.2.2 Naturalized Streamflows

Figure 6-1 in the accompanying report highlights the necessity of producing hydrographs under natural conditions and under actual, licensed, and future proposed water use conditions. Summit (2009) provided naturalized streamflow estimates for Vaseux Creek at the mouth. In addition, as part of the Okanagan Water Supply and Demand Project, net and naturalized flows were modelled for the majority of Okanagan tributaries, including Vaseux Creek (Summit 2010). Figure 2-1 provides a summary of the modelled mean weekly net and naturalized streamflows for Vaseux Creek at the mouth for 1996-2006 (i.e., the model calibration period).

Phases 2 and 3 of the Okanagan Water Supply and Demand Project included modeling of multiple future scenarios for the Okanagan Basin, which considered projected climate change, population growth, change to irrigation efficiencies, and other factors. Net and naturalized streamflow outputs for Vaseux Creek at the mouth are available for each future scenario.

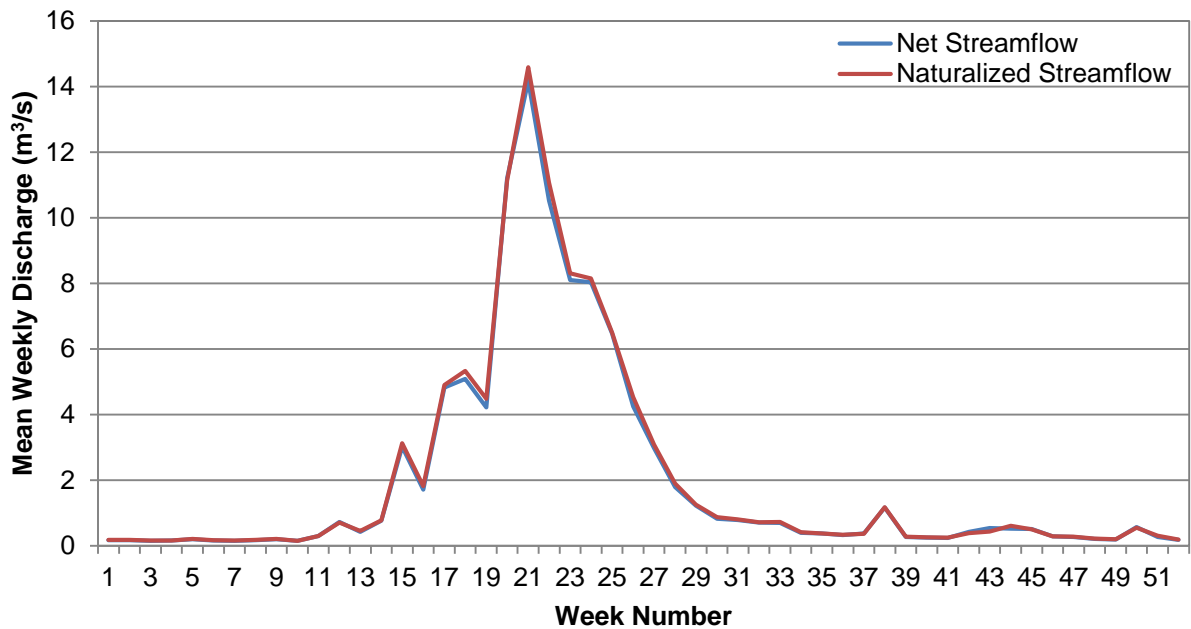


Figure 2-1
Mean weekly net and naturalized flows for Vaseux Creek at the mouth, 1996-2006 (Summit 2010)

2.3 FISH AND AQUATIC HABITAT

Grainger (2011) completed a fish passage culvert assessment within Vaseux Creek, documenting culverts which present a barrier to fish migration. In addition, ONA (2006) documented a waterfall approximately 5 km from the mouth of Vaseux Creek and identified it as a permanent barrier to fish migration.

Ecoscape (2007) completed sensitive habitat inventory and mapping (SHIM) for Vaseux Creek in 2007.

Since current (and potentially historic) aquatic habitat information is important for developing an EFN flow regime, it is recommended that up-to-date aquatic habitat information be obtained from publically available databases at the time of investigation.²

2.3.1 Current and Historical Fish Species Presence

Fish species found in Vaseux Creek include rainbow trout, steelhead, sockeye salmon, mountain whitefish, bridgelip sucker, longnose dace, and prickly sculpin (ESSA and Solander 2009).

² Aquatic habitat information, including fish barriers can be obtained from the Government of B.C. Habitat Wizard: <http://www.env.gov.bc.ca/habwiz/>.

Since current (and potentially historic) fish presence information is important for developing an EFN flow regime, it is recommended that up-to-date fish presence information be obtained from publically available databases at the time of investigation.³

2.3.2 Fish Periodicity and Habitat Suitability

No stream-specific fish periodicity or habitat suitability indices have been developed for Vaseux Creek (Table 6-1 in the accompanying main report). However, Appendix E of the accompanying report provides information on salmonid species-specific life stage periodicities for the Okanagan Basin, as well as habitat suitability index (HSI) curves for select species. The information within Appendix E should be used at a minimum to support EFN-setting for Vaseux Creek.

2.4 WATER USE AND STORAGE

There are no major water suppliers within the Vaseux Creek watershed (Dobson 2008 [included in Summit 2010]). However, water is used for irrigation purposes in surrounding areas (Section 2.4.3).

Summit (2010) provides an estimate of actual surface water use within the Vaseux Creek watershed for 1996-2006 in Appendix C of the Okanagan Water Supply and Demand Project – Phase 2. The actual mean annual surface water use over 1996-2006 was estimated to be 30 ML.

2.4.1 Storage Reservoirs

There is no developed storage within the Vaseux Creek watershed.

2.4.2 Water Licenses and Major Points of Diversion

There are 26 current water extraction licences within the Vaseux Creek watershed. Since knowledge of current water licences are critical in developing EFN flow regimes, it is recommended that up-to-date water licence information be obtained at the time of investigation.⁴

2.4.3 Interbasin Transfers

There are no direct diversions of water into or out of the Vaseux Creek watershed; however, Dobson (2008) reported that water is distributed out of the Vaseux Creek watershed to surrounding areas for irrigation purposes.

³ Fish presence information can be obtained from the Government of B.C. Fish Inventory Summary System Database Query: <http://www.env.gov.bc.ca/fish/fiss/>.

⁴ Water Licence Information can be obtained from the Government of B.C. Water Licences Query: http://a100.gov.bc.ca/pub/wtrwhse/water_licences.input.

2.5 GROUNDWATER AND SURFACE WATER INTERACTION

Summit (2009) identified that Vaseux Creek likely loses water to groundwater and estimated that streamflow is lost to groundwater at a rate of 0.014 m³/s per km of channel on the alluvial fan (Section 3.6 of Summit 2009).

2.6 TRADITIONAL KNOWLEDGE

The current version of this document does not include presentation of any Okanagan Nation Traditional Knowledge. However it is anticipated that a future revision will include such information, as well as potentially other technical information held by the Okanagan Nation Alliance Fisheries Department.

References

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