

Appendix X - Whiteman Creek

APPENDIX X

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

Whiteman Creek



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APPENDIX X

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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 Whiteman 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 Whiteman Creek is provided in Table 6-1 in the accompanying report and Table X-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 Whiteman Creek by Koshinsky (1972), Shepherd and Ptolemy (1999), nhc (2001), and 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 Whiteman Creek. Available information sources for Whiteman Creek are included within Table X-1 at the end of this appendix.

2.1 OVERVIEW OF THE WATERSHED

Whiteman Creek has a watershed area of approximately 203 km². The watershed has a relatively flat plateau headwaters area and a steep middle section before the creek discharges into Okanagan Lake. The main tributary to Whiteman Creek is Bouleau Creek which is fed by Bouleau Lake. The main land use within the upper watershed is forestry, while agriculture and urban development is present in the lower reaches.

The Whiteman Creek watershed is shown in Map 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 Whiteman 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

- **Whiteman Creek Above Bouleau Creek** (WSC 08NM174; Drainage area: 114 km²; Natural; Period of record: 1971-Present)

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

- **Whiteman Creek near Vernon** (WSC 08NM046; Drainage area: 197 km²; Regulated; Period of record: 1920-1970)
- **Whiteman Creek at the Mouth** (WSC 08NM180; Drainage area: 197 km²; Regulated; Period of record: 1970-1972)

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. nhc (2001) and Summit (2009) provided naturalized streamflow estimates for Whiteman 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 Whiteman Creek (Summit 2010). Figure 2-1 provides a summary of the modelled mean weekly net and naturalized streamflows for Whiteman 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 Whiteman Creek at the mouth are available for each future scenario.

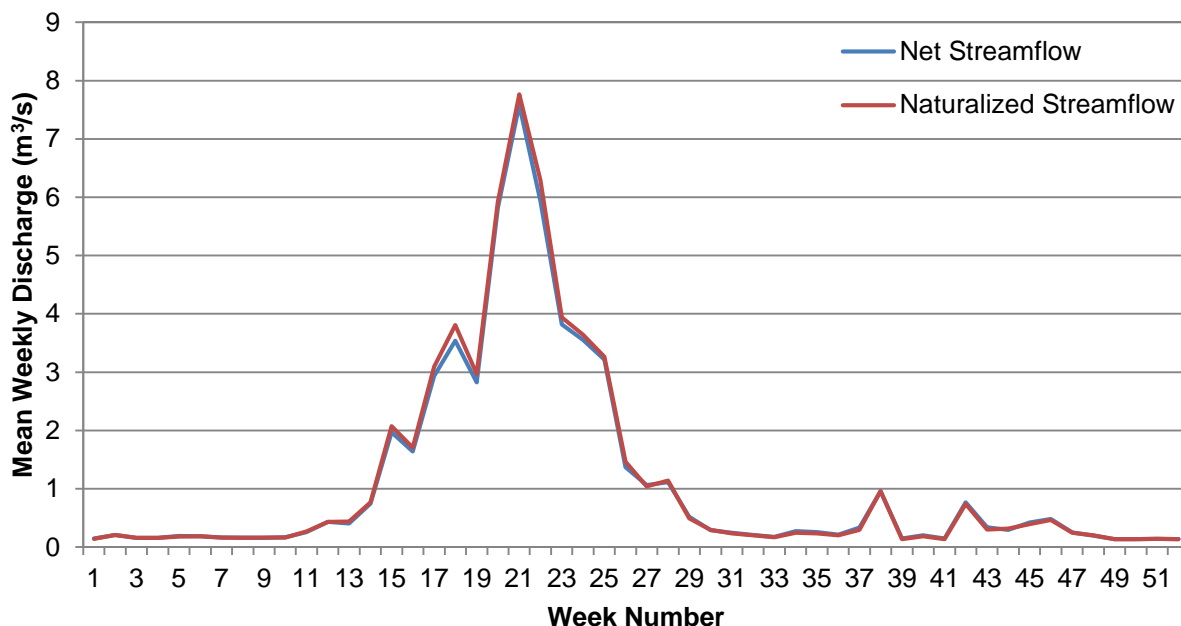


Figure 2-1
Mean weekly net and naturalized flows for Whiteman Creek at the mouth, 1996-2006 (Summit 2010)

2.3 FISH AND AQUATIC HABITAT

Wildstone Resources Ltd. (1997) completed an Overview Fish Habitat Assessment Procedure of the Whiteman Creek watershed. In addition, a more detailed assessment of fish habitat was completed by Wildstone Resources Ltd. in 1998, including a summary of water quality, fish distribution, and habitat surveys and ratings (Wildstone Resources Ltd. 1998).

No sensitive habitat inventory and mapping (SHIM) has been completed for Whiteman Creek (Table 6-1 in the accompanying main report).

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 Whiteman Creek include rainbow trout and kokanee salmon (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 Whiteman Creek (Table 6-1 in the accompanying main report). However, Appendix E of the accompanying report provides information on 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 Whiteman Creek.

2.4 WATER USE AND STORAGE

The Okanagan Indian Band (OKIB) is the primary water supplier within the Whiteman Creek watershed (Dobson 2008 [included in Summit 2010]). Water extracted from the creek is used by residents within the watershed, as well as surrounding areas (Dobson 2008).

Summit (2010) provides an estimate of actual surface water use within the Whiteman 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 1 ML.

2.4.1 Storage Reservoirs

Although there are a number of lakes, there is no developed storage within the Whiteman Creek watershed (Dobson 2008).

2.4.2 Water Licences and Major Points of Diversion

There are 12 current water extraction licences within the Whiteman Creek watershed. Since knowledge of current water licences is 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 Whiteman Creek watershed; however, Dobson (2008) reported that water is distributed to surrounding areas (i.e., residual areas W-4 and W-5)⁵ for domestic use.

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.

⁵ The geographic location of the residual areas and water use areas can be found on Figure 1.1 in Dobson (2008), and Maps 1 and 3 in Summit (2010).

2.5 GROUNDWATER AND SURFACE WATER INTERACTION

nhc (2001) reports that Whiteman Creek is likely an influent stream, gaining streamflow from groundwater in the lower reaches. However, Summit (2009) reports that there is likely no net loss / gain of streamflow to or from groundwater (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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