

Appendix R - Shorts Creek

APPENDIX R

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

Shorts Creek



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APPENDIX R

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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 Shorts 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 Shorts Creek is provided in Table 6-1 in the accompanying report and Table R-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 Shorts Creek by Koshinsky (1972), 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 Shorts Creek. Available information sources for Shorts Creek are included within Table R-1 at the end of this appendix.

2.1 OVERVIEW OF THE WATERSHED

Shorts Creek has a watershed area of approximately 186 km². The Shorts Creek watershed drains gently sloping plateau headwaters before flowing over a series of waterfalls through a steep-sided canyon within the lower reaches of the watershed. Below the canyon, Shorts Creek flows over a large alluvial fan before discharging into Okanagan Lake. The main tributary to Shorts Creek is Dunwaters Creek. Additional tributaries include Stuart, Wilson, McMullen, Attenborough, Hamilton, Emily, Christie, Godwin, Pyke, Tarrant, and Young Creeks (Wildstone Resources Ltd. 1997). Forestry is the primary land use in the upper watershed, with Fintry Provincial Park located on the alluvial fan at the mouth.

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

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.

2.2 STREAMFLOWS

2.2.1 Hydrometric Data

There are currently no active Water Survey of Canada (WSC) hydrometric stations within the Shorts Creek watershed; however, historic records are available for the following hydrometric station:

- **Shorts Creek at the Mouth** (WSC 08NM151; Drainage area: 185 km²; Regulated; Period of record: 1969-1982)

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

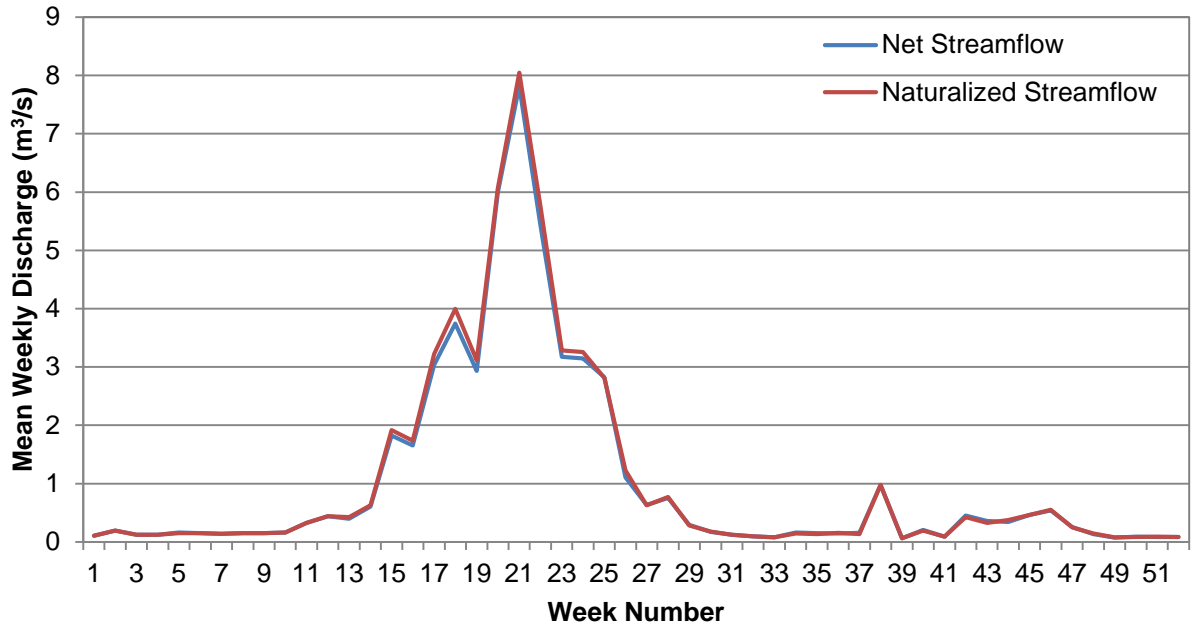


Figure 2-1
Mean weekly net and naturalized flows for Shorts Creek at the mouth, 1996-2006 (Summit 2010).

2.3 FISH AND AQUATIC HABITAT

Trumbley Environmental Consulting Ltd. (2008) completed a fish presence culvert inspection (FPCI) for select sites within the Shorts Creek watershed. During the FPCI, one culvert was confirmed to be a barrier to fish migration within Dunwaters Creek (Trumbley Environmental Consulting Ltd. 2008).

Wildstone Resources Ltd. (1997) also completed an Overview Fish Habitat Assessment Procedure for the Shorts Creek watershed. A summary of fish and fish habitat within Shorts Creek and associated tributaries is provided within Section 4.3.3 of the report (Wildstone Resources Ltd. 1997). A 50 m waterfall was documented approximately 1.1 km upstream from the mouth of Shorts Creek; however, Wildstone Resources Ltd. (1997) confirmed fish presence upstream and downstream of the waterfall.

No sensitive habitat inventory and mapping (SHIM) has been completed for Shorts 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 in order to set appropriate EFNs for Shorts Creek.²

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/>.

2.3.1 Current and Historical Fish Species Presence

Fish species found in Shorts Creek include rainbow trout, kokanee salmon, eastern brook trout, largescale sucker, longnose dace, prickly sculpin, and sculpin (general) (ESSA and Solander 2009).

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 Shorts Creek (Table 6-1 in the accompanying main report). However, Appendix E 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 Shorts Creek.

2.4 WATER USE AND STORAGE

There are no major water suppliers within the Shorts Creek watershed; however, many local Fintry residents are known to extract water from Shorts Creek for personal use due to the absence of water systems in some nearby subdivisions (Okanagan Lake BC 2016).

Summit (2010) provides an estimate of actual surface water use within the Shorts 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 24 ML.

2.4.1 Storage Reservoirs

There is no developed storage within the Shorts Creek watershed (Dobson 2008 [included in Summit 2010]; Summit 2009).

2.4.2 Water Licences and Major Points of Diversion

At present, there are 21 water extraction licences within the Shorts 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

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.

2.4.3 Interbasin Transfers

Dobson (2008) reported that the Okanagan Indian Band diverts water out of the Shorts Creek watershed to Residual Area W-5 (Node 15).⁵ In addition, Dobson (2008) reported that the Lakeview Irrigation District (now Lakeview Service Area operated by the City of West Kelowna) was planning to begin diverting water from Dunwater Creek to into Lambly Creek; however, this diversion does not appear to have been established to date.

2.5 GROUNDWATER AND SURFACE WATER INTERACTION

Summit (2009) identified that Shorts 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.

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).

References

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- Wildstone Resources Ltd. 1997. Overview Fish Habitat Assessment Procedure Equesis, Nashwito, Whiteman and Shorts Creeks. Prepared for Okanagan Indian Band, April 1997.

