

Appendix Q - Shingle Creek

APPENDIX Q

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

Shingle Creek



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APPENDIX Q

Table of Contents

SECTION	PAGE NO.
Table of Contents	i
1 Introduction	Q-1
2 Relevant Information for Setting Environmental Flow Needs	Q-1
2.1 Overview of the Watershed	Q-1
2.2 Streamflows	Q-1
2.3 Fish and Aquatic Habitat	Q-3
2.4 Water Use and Storage	Q-4
2.5 Groundwater and Surface Water Interaction	Q-5
2.6 Traditional Knowledge	Q-5
References	

1 Introduction

The purpose of this appendix is to provide information to support the application of recommended environmental flow needs (EFN)-setting methods for Shingle 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 (ONA). A summary of current available information for Shingle Creek is provided in Table 6-1 in the accompanying report and Table Q-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 Shingle Creek by Koshinsky (1972) and ESSA and Solander (2009).

2 Relevant Information for Setting Environmental Flow Needs

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

2.1 OVERVIEW OF THE WATERSHED

Shingle Creek has a watershed area of approximately 299 km². Shingle Creek flows from the west and drains into Okanagan River between Okanagan Lake and Skaha Lake. The main tributary to Shingle Creek is Shatford Creek. The predominant land use activities within the watershed include forestry and agriculture.

The Shingle 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 Shingle Creek watershed:

- **Shatford Creek near Penticton** (WSC 08NM037; Drainage area: 101 km²; Regulated; Period of record: 1919-Present)

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

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

- **Shingle Creek Above Kaleden Diversion** (WSC 08NM038; Drainage area: 44.8 km²; Natural; Period of record: 1920-1977)
- **Riddle Creek near West Summerland** (WSC 08NM070; Drainage area: 33.4 km²; Natural; Period of record: 1930-1931)
- **Shingle Creek at the Mouth** (WSC 08NM150; Drainage area: 308 km²; Regulated; Period of record: 1969-1981)

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 Shingle 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 Shingle Creek (Summit 2010). Figure 2-1 provides a summary of the modelled mean weekly net and naturalized streamflows for Shingle 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, changes to irrigation efficiencies, and other factors. Net and naturalized streamflow outputs for Shingle Creek at the mouth are available for each future scenario.

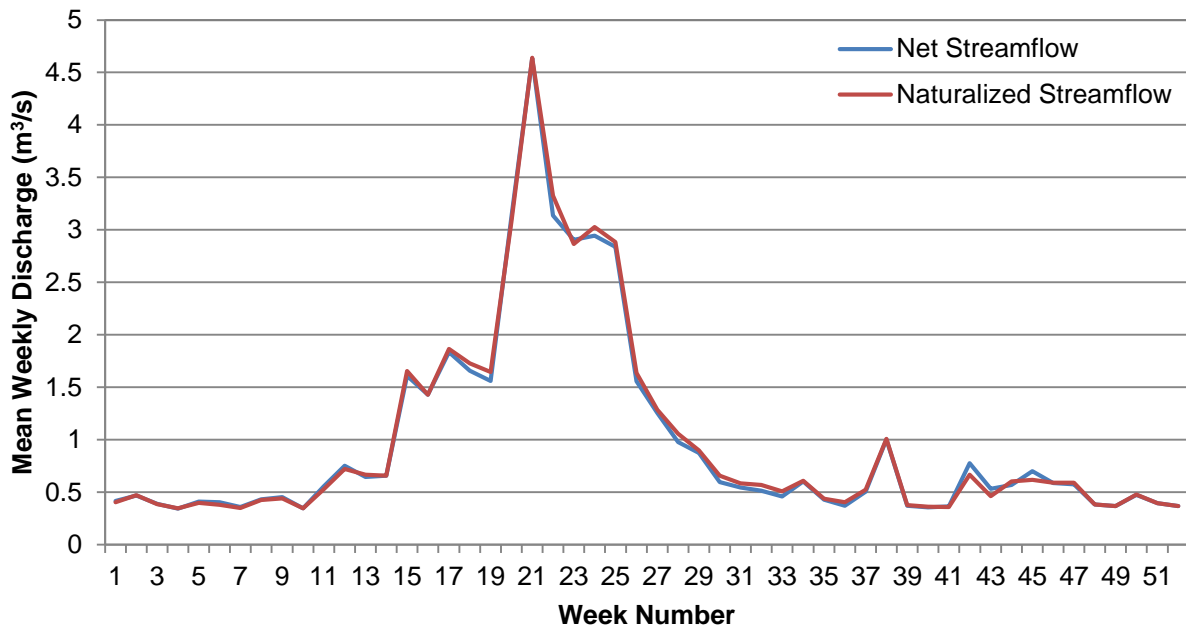


Figure 2-1
Mean weekly net and naturalized flows for Shingle Creek at the mouth, 1996-2006 (Summit 2010)

2.3 FISH AND AQUATIC HABITAT

Shingle Creek is considered of high importance for fisheries and aquatic habitat. Kokanee salmon from Skaha Lake spawn in Shingle Creek (Rae 2005). In 2006, ONA (2006) documented five partial barriers to fish migration on Shingle Creek and two partial barriers on Shatford Creek.

No sensitive habitat inventory and mapping (SHIM) has been completed for Shingle 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 Shingle Creek include rainbow trout, kokanee salmon, eastern brook trout, mountain whitefish, largescale sucker, longnose dace, prickly sculpin, sculpin (general), and peamouth chub (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/>.

In addition, the Summerland Hatchery was reported to have previously stocked Shingle Creek with eyed egg rainbow trout, chinook salmon, steelhead, and sockeye salmon (Anonymous, Undated)

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 in order to set appropriate EFNs for Shingle Creek.³

2.3.2 Fish Periodicity and Habitat Suitability

No stream-specific fish periodicity or habitat suitability indices have been developed for Shingle 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 Shingle Creek.

2.4 WATER USE AND STORAGE

The Penticton Indian Band (PIB) is the main water supplier in the Shingle Creek watershed, diverting water for domestic and irrigation purposes within its reserve lands (Dobson 2008 [included in Summit 2010]). In addition, the Farleigh Lake Water Users Community operates a small water treatment system within the watershed.

Summit (2010) provides an estimate of actual surface water use within the Shingle 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 705 ML.

2.4.1 Storage Reservoirs

The PIB hold licences to store water in Brent Lake and Farleigh Lake within the Shingle Creek watershed. In addition, the Farleigh Lake Water Users Community also holds storage licenses on Farleigh Lake (Dobson 2008). Spring runoff is captured within the two reservoirs and is used for irrigation and domestic water use purposes.

2.4.2 Water Licences and Major Points of Diversion

At present, there are 191 current water extraction licences within the Shingle 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

There are no direct diversions of water into or out of the Shingle Creek watershed.

2.5 GROUNDWATER AND SURFACE WATER INTERACTION

Summit (2009) identified that Shingle Creek likely loses water to groundwater and estimates 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

- Anonymous. Undated. Okanagan Watershed Descriptions for Chute Creek, Eneas Creek, Equis Creek, Kelowna (Mill) Creek, Lambly Creek, Mission Creek, Naramata Creek, Naswhito Creek, Okanagan lake, Peachland Creek, Penticton Creek, Powers Creek, Robinson Creek, Shingle Creek, Similkameen River, Trepanier Creek, Trout Creek, Vaseux Creek, Vernon Creek. Ecocat Report ID 32362.
- Dobson Engineering Ltd (Dobson). 2008. Water Management and Use Study. Prepared for Okanagan Basin Water Board as part of the Phase 2 Okanagan Water Supply and Demand Project.
- ESSA Technologies Ltd. and Solander Ecological Research (ESSA and Solander). 2009. Instream Flow Analysis for the Okanagan Water Supply & Demand Project. Prepared for the Okanagan Basin Water Board.
- Koshinsky, G. D. 1972. Estimates of Minimum Flow Requirements for Okanagan Tributary Streams for the Propagation of Salmonid Fish Species Endemic to the Main Lakes. March, 1972.
- Okanagan Nation Alliance (ONA). 2006. Survey of Barriers to Anadromous Fish Migration in the Canadian Okanagan Sub Basin. Prepared for Colville Confederated Tribes, March 2006.
- Summit Environmental Consultants Inc. (Summit). 2009. Surface Water Hydrology and Hydrologic Modelling Study "State of the Basin" Report. Prepared for the Okanagan Basin Water Board as part of the Phase 2 Okanagan Water Supply and Demand Project.
- Summit Environmental Consultants Inc. (Summit). 2010. Okanagan Water Supply and Demand Project: Phase 2 Summary Report. Prepared for the Okanagan Basin Water Board, July 2010.

