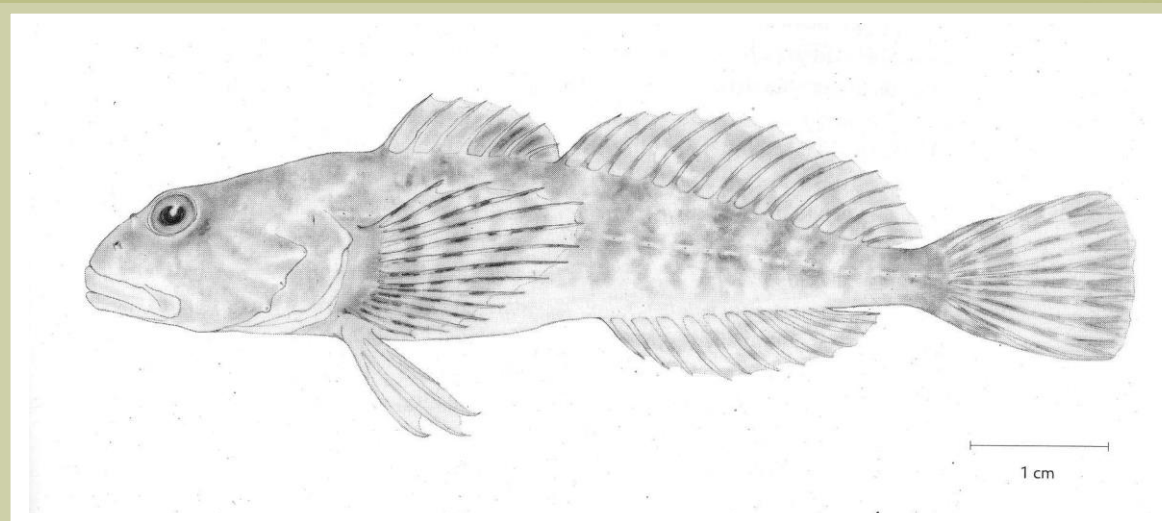


Report on the Progress of Management Plan Implementation for the Columbia Sculpin (*Cottus hubbsi*) in Canada for the Period 2012- 2016

Columbia Sculpin



2017

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Preface

The federal, provincial, and territorial government signatories under the [Accord for the Protection of Species at Risk \(1996\)](#) agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Under Section 72 of the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the competent ministers are responsible for reporting on the implementation of the management plan for a species at risk, and on the progress towards meeting its goal and objectives within five years of the date when the management plan was placed on the Species at Risk Public Registry and in every subsequent five-year period, until its goal and objectives have been achieved or the status of the species changes to threatened or endangered under SARA.

Reporting on the progress of management plan implementation requires reporting on the collective efforts of the competent minister(s), provincial and territorial governments and all other parties involved in conducting activities that contribute to the species' conservation. Management plans set goals and objectives for maintaining sustainable population levels of one or more species that are particularly sensitive to environmental factors, but which are not in danger of becoming extinct. Some of the identified conservation measures are sequential to the progress or completion of others and not all may be undertaken or show significant progress during the timeframe of a Report on the Progress of Management Plan Implementation (Progress Report).

The Minister of Fisheries and Oceans is the competent minister under SARA for the Columbia Sculpin and has prepared this Progress Report.

As stated in the preamble to SARA, success in the conservation of species at risk depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in the management plan and will not be achieved by Fisheries and Oceans Canada, or any other jurisdiction alone. The cost of conserving species at risk is shared amongst different constituencies. All Canadians are invited to join in supporting and implementing the Management Plan for the Columbia Sculpin in Canada for the benefit of the species and Canadian society as a whole.

Acknowledgments

This Progress Report was prepared by Lily Stanton with input from Fisheries and Oceans Canada (DFO). The Department of Fisheries and Oceans would also like to express its appreciations to all individuals and organizations who have contributed to the conservation of the Columbia Sculpin.

Executive Summary

The Columbia Sculpin (*Cottus hubbsi*) was listed as a species of Special Concern under the *Species at Risk Act* (SARA) in 2003. The *Management Plan for the Columbia Sculpin (Cottus hubbsi) in Canada* (DFO 2012) was finalized and published on the Species at Risk Public Registry in 2012.

The main threats identified for the Columbia Sculpin include: flow regulation and consumptive water use; exotic species; water quality; land use; hybridization; and climate change.

The management goal for the Columbia Sculpin (DFO 2012) is to:

Ensure long-term viability of this species across its extant distribution in the wild.

The management objectives for the Columbia Sculpin (DFO 2012) are to:

1. Maintain self-sustaining populations of Columbia Sculpin throughout its natural range in Canada;
2. Maintain, and where possible enhance the ecological integrity of habitat for Columbia Sculpin;
3. Increase scientific understanding of Columbia Sculpin through additional investigation of its natural history, habitat requirements and threats to its persistence; and
4. Foster awareness of Columbia Sculpin and its conservation status.

This report documents the progress of Management Plan implementation for the Columbia Sculpin in Canada for the period 2012-2016. It summarizes progress made towards achieving the goals and objectives set out in the Management Plan, including:

- completing research that helps to reduce impacts on, and better understand threats to, Columbia Sculpin in relation to the operations of hydro-electric facilities in the Lower Columbia River; and,
- addressing key knowledge gaps, such as habitat use requirements at different life stages, and life history information such as timing of spawning.

While there has been progress towards meeting the management goal, objectives, and performance measures presented in the Management Plan, additional measures will be necessary to ensure long-term viability of Columbia Sculpin in British Columbia. These include, but are not limited to, establishment of a long-term monitoring program, increased scientific understanding of threats and limiting factors, continued targeted stewardship, development and promotion of additional management and mitigation measures in current land use activities.

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1. Introduction

This Progress Report outlines the progress made towards meeting the goal and objectives listed in the *Management Plan for the Columbia Sculpin (Cottus hubbsi) in Canada* (DFO 2012) from 2012 to 2016 and should be considered as one in a series of documents for this species that are linked and should be taken into consideration together; including the [Committee on the Status of Endangered Wildlife in Canada \(COSEWIC\) status assessment and report](#) (COSEWIC 2000, 2010), and the [Management Plan for the Columbia Sculpin](#) (DFO 2012).

Section 2 of this document reproduces or summarizes key information on the threats to the species, the management goal and objectives, approaches to meeting the objectives, and performance measures to assess and determine if the goal and objectives are being met. For more details, readers should refer back to the Management Plan (DFO 2012).

Section 3 of this document reports on the progress of activities identified in the Management Plan to support achieving the management goal and objectives, and Section 4 summarizes the progress toward achieving the management goal and objectives.

2. Background

2.1 COSEWIC Assessment Summary

The listing of the Columbia Sculpin in 2003, which led to the development and publication of the Management Plan in 2012, was based on the information provided in the COSEWIC assessment conducted in 2000 (Peden 2000) and re-affirmed in 2010 (COSEWIC 2010; COSEWIC assessment information is also included in Section 1.1 of the Management Plan).

Date of Assessment: May 2000

Common name (population): Columbia Sculpin

Scientific name:

Cottus hubbsi

Status

Special Concern

Reason for Designation

This subspecies of the mottled sculpin¹ occurs in southern British Columbia, and is impacted by habitat loss. The risk of extirpation is reduced by the possibility of rescue from nearby populations in the USA.

Occurrence in Canada: British Columbia

Status history: Designated Special Concern in May 2000. Status re-examined and confirmed in November 2010².

¹ COSEWIC described the Columbia Sculpin as a “subspecies of the mottled sculpin”. Recent evidence suggests Columbia Sculpin are a distinct species and it is treated as such in the Management Plan and 2010 COSEWIC assessment.

² COSEWIC 2010 assessment provides a more thorough rationale for its Special Concern designation: “*In Canada, this small freshwater fish is endemic to the Columbia River basin where it has a small geographic distribution. It is a bottom-dwelling and sedentary fish as an adult, making it particularly susceptible to declines in habitat area and quality from drought and changes in water flow. It is close to meeting Threatened status owing to its small geographic range, relatively few locations and ongoing declines in habitat quality.*”

2.2 Threats

This section summarizes the information found in Section 1.5 of the Management Plan on threats to the Columbia Sculpin.

2.2.1 Threats to the Columbia Sculpin

Table 1. Summary of the threats identified for the Columbia Sculpin, based on the Management Plan.

Threat	Level of Concern ³	Description
Flow regulation	Medium	Altered flow regimes and fluctuating water levels from dam operations leading to habitat instability and stranding.
Exotic species	Medium	Non-native fish species introduced into the Columbia River drainage may prey upon or outcompete Columbia Sculpin for resources.
Consumptive water use	Low to Medium	Residential and commercial water use resulting in fluctuating water levels reduces habitat availability, quality, and stability.
Water quality	Low	Pollution from mining, industry, and agriculture degrades aquatic habitat by elevating metal and nutrient concentrations.
Land use	Low	Habitat alteration and destruction impacts riparian habitat by increasing sedimentation, siltation and water temperatures.
Hybridization	Low	The potential threat of introgression through hybridization of Columbia Sculpin (<i>C. hubbsi</i>) and Malheur Sculpin (<i>C. bendirei</i>) where the species co-occur.
Climate change	Low at present	Changes to precipitation, water levels, and temperatures may alter Columbia Sculpin abundance and distribution.

2.3 Conservation

This section summarizes the management goal and objectives (found in the Management Plan; DFO 2012) necessary for the conservation of the Columbia Sculpin, and associated performance measures that define and measure progress towards their achievement.

2.3.1 Management Goal and Objectives

Section 2 of the Management Plan (DFO 2012) identified the following management goal necessary for the conservation of the species:

Ensure long-term viability of this species across its extant distribution in the wild.

The Management Plan further states that this species is likely to always remain at risk due to its limited distribution in Canada.

Section 2 of the Management Plan also identified the following management objectives:

³ Level of Concern indicates whether managing the threat is an overall high, medium, or low level of concern for conservation of the species, taking into account the stress, extent, occurrence, frequency, casual certainty, and severity of the specific threat. The full threats classification table can be found in Section 1.5 of the Management Plan (DFO 2012).

1. Maintain self-sustaining populations of Columbia Sculpin throughout its natural range in Canada;
2. Maintain, and where possible enhance the ecological integrity of habitat for Columbia Sculpin;
3. Increase scientific understanding of Columbia Sculpin through additional investigation of its natural history, habitat requirements, and threats to its persistence; and
4. Foster awareness of Columbia Sculpin and its conservation status.

2.3.2 Performance Measures

Interim⁴ performance measures (as outlined in Section 2.3 of the Management Plan; DFO 2012) are reproduced in detail in Section 3.2.1 of this document.

3. Progress Towards Conservation

The Management Plan for the Columbia Sculpin (DFO 2012) divides conservation efforts into three broad strategies: 1) protection, 2) management, and 3) research. Progress in carrying out these broad strategies is reported in Section 3.1 of this document. Section 3.2 reports on the progress toward meeting interim performance measures.

3.1 Activities Supporting Conservation

Table 2 provides information on the implementation of activities undertaken to address the approaches and broad strategies identified in the Management Plan.

⁴ The Management Plan (DFO 2012) states that specific performance measures have not been devised; however, it includes questions to guide the measurement of progress. These questions are referred to herein as “interim performance measures”.

Table 2. Details of activities supporting the conservation of the Columbia Sculpin from 2012 to 2016.

Approaches	Description and Results	Management objectives addressed	Participants
Broad Strategy 1: Protection			
Clarify and mitigate threats to Columbia Sculpin	<ul style="list-style-type: none"> • Golder Associates (2015) provided recommendations to BC Hydro to help reduce the occurrence of stranding in areas of the Lower Columbia River and Kootenay River. • Amec (2014) assessed effects for BC Hydro under the Lower Columbia River Fish Management Plan in relation to hydroelectric dams within the region, including: <ul style="list-style-type: none"> ○ impacts of water level fluctuations on the distribution and habitat use patterns of the Columbia Sculpin; ○ potential impacts of daily and seasonal operations of the HLK;⁵ and ○ impacts of flow regulation and risks of when water levels are reduced. 	1,2	BC Hydro; Golder Associates; Amec
	<ul style="list-style-type: none"> • From 2013 to 2014 the LSIB⁶, ONC⁷, and partners conducted habitat restoration activities along a section of the Similkameen River, including: <ul style="list-style-type: none"> ○ construction of low-impact, soft bio-engineered structures to mitigate bank erosion; and ○ planting of native vegetation to stabilize banks. 	1,2	GOC ⁸ ; LSIB & partners; ONC & partners
Broad Strategy 2: Management			
Support establishment of a stewardship group for Columbia Sculpin	<ul style="list-style-type: none"> • A specific stewardship group for Columbia Sculpin has not been established. 	None	None

⁵ Hugh L. Keenleyside Dam

⁶ Lower Similkameen Indian Band

⁷ Okanagan Nation Alliance

⁸ Government of Canada

Approaches	Description and Results	Management objectives addressed	Participants
	<ul style="list-style-type: none"> The KNC⁹ implemented an “All Living Things” program within Ktunaxa Territory (including Columbia Lake, Lower Kootenay, St. Mary’s and Tobacco Plains). This program is the foundation of land stewardship in Ktunaxa Territory, with long term results aimed at responding to SARA listings meaningfully. 	1,2,3,4	GOC; KNC & partners
Inform and educate stakeholders and general public about the species and general biodiversity values, with the intent of promoting active stewardship, reducing impacts to habitat and reducing risk of non-native species introduction	<ul style="list-style-type: none"> The KNC conducted habitat inventories, ecosystem based assessments and restoration projects to prioritize protection, rehabilitation and education for species at risk as part of the “All Living Things” program. <ul style="list-style-type: none"> Focusing on riparian and grassland habitat, these initiatives aim to increase stewardship activates and engagement while using an ecosystem based, multispecies approach, which indirectly benefits a large number of species within the region, including Columbia Sculpin. 	1,4	GOC; KNC & partners
	<ul style="list-style-type: none"> The SCBC¹⁰ completed pilot guides to Species at Risk Voluntary Stewardship Practices for Riparian Areas in Settled Landscapes, in addition to Guidance for Restoration Activities in Riparian Areas. <ul style="list-style-type: none"> These guides were created to engage voluntary stewardship actions to reduce impacts and conserve wildlife and their habitat; the Columbia Sculpin is a Species at Risk potentially impacted by Riparian Management (Pearson and Blair 2013a, 2013b). 	1,4	GOC; SCBC & partners
Address information gaps that limit conservation of Columbia Sculpin	<ul style="list-style-type: none"> Amec (2014) gathered important information on the biophysical characteristics of specific spawning areas, nursery areas, and overwatering habitat, while also examining spawning behaviour, embryo survival and adult nest guarding behaviour in relation to daily and seasonal water level fluctuations as part of the Lower Columbia River Sculpin and Dace Life History Assessment. 	3	BC Hydro; Amec

⁹ Ktunaxa Nation Council

¹⁰ Stewardship Centre for British Columbia

Approaches	Description and Results	Management objectives addressed	Participants
Broad Strategy 3: Research			
Define important habitats for Columbia Sculpin through habitat suitability mapping	<ul style="list-style-type: none"> • Amec (2014): <ul style="list-style-type: none"> ○ developed habitat suitability indices for depth, velocity and substrate for Columbia Sculpin in the Lower Columbia River; and ○ gathered observational data examining habitat characteristics at various life stages, and seasonal and diel difference in habitat use from 2009-2014. 	3	BC Hydro; Amec
Develop and implement a long-term monitoring program	<ul style="list-style-type: none"> • A long-term monitoring program has not yet been established. 	None	None
	<ul style="list-style-type: none"> • Monitoring of trends in habitat quantity and quality, water quality, land use, water use and trends in abundance of Columbia Sculpin and its prey species has not been initiated for Columbia Sculpin. 	None	None
	<ul style="list-style-type: none"> • Amec (2014) gathered preliminary estimates of relative abundance and distribution of Columbia Sculpin through their five-year study in the lower Columbia and Similkameen River. 	3	BC Hydro; Amec

3.2 Summary of Progress Towards Conservation

3.2.1 Status of Performance Measures

The following is a summary of the progress made towards the conservation of the Columbia Sculpin, as evaluated by the interim performance measures from the Management Plan (DFO 2012).

Broad Strategy 1: Protection

1. *Have threats been clarified and assessed? Are threats being mitigated? Has a plan that recognizes these habitats as important been developed? Have key habitats been effectively protected?*

BC Hydro's Columbia River Project Water Use Plan (Amec 2014, Golder Associates 2015) assessed threats in relation to stranding and the seasonal and daily water level fluctuations from operations of the Hugh L. Keenleyside Dam in the Lower Columbia River (refer to Table 2 for further details). These reports provided a number of recommendations aiming to mitigate threats to various life stages of the Columbia Sculpin.

The Lower Similkameen Indian Band, Okanagan Nation Alliance, and partners conducted habitat restoration activities along a section of the Similkameen River in response to changing river dynamics, and high water flows of the spring freshet (refer to Table 2 for further details).

Currently, no plans have been developed that recognize and protect key habitats.

Broad Strategy 2: Management

2. *Has a stewardship group been established? Is it adequately supported with funding and technical expertise? Is the stewardship group achieving the goals outlined in the management plan?*

Although no specific stewardship group has been established for the Columbia Sculpin, the Stewardship Centre for British Columbia initiated a number of pilot projects (refer to Table 2 for further details) targeting riparian areas, and a number of species at risk including the Columbia Sculpin. In addition, the Ktunaxa Nation Council's "All Living Things" program coordinated funding, project management and conservation planning using an ecosystem based, multi-species approach to conservation and restoration of species at risk (refer to Table 2 for further details). Additional work specifically targeting Columbia Sculpin will be required to achieve the goal outlined in the Management Plan (DFO 2012).

3. *Have educational materials been produced? Has public perception and awareness been affected? How many classes have received educational presentations?*

Educational materials and presentations focusing on awareness and conservation of Columbia Sculpin have not been developed.

4. Are there key information gaps that inhibit conservation of Columbia Sculpin?

Amec (2014) completed work to inform key information gaps such as habitat use requirements at different life stages, life history information (e.g. timing of spawning), and habitat use patterns in relation to water level fluctuations (refer to Table 2 for further details). However, several key knowledge gaps that inhibit the conservation of the Columbia Sculpin remain. Species identification tools to discriminate amongst related sculpin species are needed to aid in identification of adults, larvae, and young of the year (Golder Associates 2015). Diet, factors limiting population growth and distribution, population connectivity, status of key habitats, current, past and future threats, potential for increased hybridization with *C. bendirei*, and current population and trends in abundance also require further research.

Broad Strategy 3: Research

5. Have important habitats been defined for Columbia Sculpin? Have key areas in the watershed (i.e., those that are disproportionately important for maintaining habitat) been identified?

Amec (2014) formulated habitat suitability indices for Columbia Sculpin in the Lower Columbia River, and identified the temporal and biophysical habitat characteristics of key spawning and specific nursery areas within the Lower Columbia River (refer to Table 2 for further details).

6. Have monitoring programs been implemented? How long has a monitoring program been in place? Is it effective? Is it a benign activity for the population? Is funding secure for the long term?

Amec (2014) conducted monitoring within the Lower Columbia River and unregulated tributaries of the Similkameen River from 2009-2014, determining preliminary estimates of relative abundance and distribution of Columbia Sculpin (refer to Table 2 for further details); however, monitoring programs have not been formally implemented. An assessment of potential monitoring impacts on the population has not been completed. Long term funding has not been secured. Funding is largely obtained on a year to year basis through federal and other grants.

4. Concluding Statement

Through the implementation of several conservation actions, progress has been made towards achieving the management goal of ensuring long-term viability of Columbia Sculpin in British Columbia.

Further work clarifying information gaps inhibiting the conservation of Columbia Sculpin will need to be addressed, in addition to the development of monitoring programs to document changes and trends in relative abundance.

Studies conducted for BC Hydro (Amec 2014, Golder Associates 2015) have helped gather important life history, timing and habitat use information. This work has also assessed potential impacts of seasonal operations of the Hugh L. Keenleyside Dam. However, additional

conservation actions and mitigation measures will need to be further developed to manage current and future threats to the Columbia Sculpin and its habitat.

While progress has been made towards meeting the goal, objectives, and performance measures of the Management Plan, further efforts will be necessary to ensure long-term viability of Columbia Sculpin in British Columbia. These include, but are not limited to, establishment of a long-term monitoring program, increased scientific understanding of threats and limiting factors, continued targeted stewardship, development and promotion of additional management and mitigation measures in current land use activities.

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