

# Action Plan for the Nooksack Dace (*Rhinichthys cataractae* ssp.) and the Salish Sucker (*Catostomus* sp. cf. *catostomus*) in Canada

## Nooksack Dace



## Salish Sucker



Original publication 2017  
1<sup>st</sup> amendment 2020

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(*Rhinichthys cataractae* ssp.) and the Salish  
Sucker (*Catostomus* sp. cf. *catostomus*) in  
Canada**

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For copies of the action plan or for additional information on species at risk, including Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status reports and other related recovery documents, please visit the [Species At Risk Public Registry](#).

**Cover illustration:** Photographs of adult Nooksack Dace (top) and adult Salish Sucker (bottom). Photos by Mike Pearson.

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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 the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the federal competent ministers are responsible for the preparation of action plans for species listed as Extirpated, Endangered, or Threatened for which recovery has been deemed feasible. They are also required to report on progress five years after the publication of the final document on the Species at Risk Public Registry.

The Minister of Fisheries and Oceans is the competent minister under SARA for the Nooksack Dace and Salish Sucker and has prepared this action plan to implement the recovery strategies, as per section 47 of SARA. In preparing this action plan, the competent minister has considered, as per section 38 of SARA, the commitment of the Government of Canada to conserving biological diversity and to the principle that, if there are threats of serious or irreversible damage to the listed wildlife species, cost-effective measures to prevent the reduction or loss of the species should not be postponed for a lack of full scientific certainty. To the extent possible, this action plan has been prepared in cooperation with the Province of British Columbia as per subsection 48(1) of SARA.

As stated in the preamble to SARA, success in the recovery of this species depends on the commitment and cooperation of many different groups that will be involved in implementing the directions and actions set out in this action plan and will not be achieved by Fisheries and Oceans Canada (DFO) or any other jurisdiction alone. The cost of conserving species at risk is shared amongst many groups. All Canadians are invited to join in supporting and implementing this action plan for the benefit of the Nooksack Dace, Salish Sucker and Canadian society as a whole.

Under SARA, an action plan provides the detailed recovery planning that supports the strategic direction set out in the recovery strategy for the species. The plan outlines recovery measures to be taken by DFO and/or other jurisdictions or organizations to help achieve the population and distribution objectives identified in the recovery strategy. Implementation of this action plan is subject to appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations.

## Acknowledgments

This action plan was updated by Erin Gertzen and Andrew Baylis with contributions from Martin Nantel (DFO) to reflect changes made in the amended Recovery Strategy for the Nooksack Dace (*Rhinichthys cataractae* ssp.) in Canada (DFO 2020a) and the amended Recovery Strategy for the Salish Sucker (*Catostomus* sp. cf. *catostomus*) in Canada (DFO 2020b).

The original action plan (DFO 2017) was authored by Nadine Pinnell with contributions from Martin Nantel and Tom Brown (DFO). In January and February 2011, DFO held a series of workshops and community open house sessions to gather input for the development of the action plan for Nooksack Dace and Salish Sucker, in conjunction with consultations on the initial draft Recovery Strategy for Salish Sucker (2011). Various representatives from municipalities, regional districts, provincial ministries, federal agencies, Indigenous organizations, industry, agriculture, environmental non-governmental organizations and stewardship groups participated in these workshops and provided valuable input and ideas regarding actions that could be taken to support the survival and recovery of Nooksack Dace and Salish Sucker. Similarly, a number of landowners and members of the public provided ideas through community open house sessions. This input was used by DFO to guide the development of this action plan and will be used to help guide the implementation of the actions identified in the action plan wherever possible.

## Executive summary

The Nooksack Dace (*Rhinichthys cataractae* ssp.) was listed as Endangered under the *Species at Risk Act* (SARA) in 2003 and the Salish Sucker (*Catostomus* sp. cf. *catostomus*) was reclassified as Threatened under SARA in 2019. This action plan is considered one in a series of documents that are linked and should be taken into consideration together, including the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status reports (COSEWIC 2013, 2019), the recovery potential assessments (Fisheries and Oceans Canada [DFO] 2008a, 2015), and the amended recovery strategies (DFO 2020a, b).

An original action plan for the Nooksack Dace and Salish Sucker was posted on the Species at Risk Public Registry in 2017 (DFO 2017). This 2020 action plan updates the 2017 action plan to reflect changes made in the amended recovery strategies for the two species (DFO 2020a, b). Changes have been made to the measures to be taken and implementation schedule (section 1.2). Section 1.2 outlines the following: measures to be undertaken by DFO (table 1); measures to be undertaken collaboratively between DFO and its partners, other agencies, organizations or individuals (table 2); and, measures that represent opportunities for other jurisdictions, organizations or individuals to lead (table 3). In this amended action plan, new recovery measures have been added, existing measures have been refined and streamlined, and measures have been re-prioritized.

This action plan addresses the entire distribution of the Nooksack Dace and the Salish Sucker in Canada.

Nooksack Dace are known from the Brunette River, Bertrand Creek, Fishtrap Creek and Pepin Creek (Brook) watersheds in Canada. Section 4.2 of the amended recovery strategy (DFO 2020a) provides further information on the distribution of Nooksack Dace.

Salish Sucker are known from the Salwein Creek / Hopedale Slough, Chilliwack Delta (Atchelitz / Chilliwack / Semmihault Creek), Elk Creek / Hope Slough, Bertrand Creek, Fishtrap Creek, Pepin Creek, Salmon River, Mountain Slough, Agassiz Slough, Miami Creek and Little Campbell River watersheds in Canada. Section 4.2 of the amended recovery strategy (DFO 2020b) provides further information on the distribution of Salish Sucker.

This action plan outlines the measures that provide the best chance of achieving the population and distribution objectives for the species, including the measures to be taken to address the threats and monitor the recovery of the species. The population and distribution objectives for the Nooksack Dace and Salish Sucker are outlined in section 6 of the species' respective amended recovery strategies (DFO 2020a, b).

Section 1.2 outlines the measures to be taken to implement the amended recovery strategies of the Nooksack Dace and the Salish Sucker. Section 1.2 measures fall under the following broad strategies, as per the amended recovery strategy (DFO 2020):

1. inventory and monitoring
2. research
3. management and coordination
4. stewardship and outreach
5. international collaboration

For the Nooksack Dace and Salish Sucker, critical habitat was identified to the extent possible, using the best available information, in section 8 of their respective amended recovery strategies (DFO 2020a, b). In 2016, a SARA Critical Habitat Order was put in place for Nooksack Dace to protect the species' critical habitat from destruction. In August 2020, the 2016 SARA Critical Habitat Order was amended to reflect the changes to Nooksack Dace critical habitat in the amended recovery strategy (DFO 2020a). For Salish Sucker, legal protection was accomplished on August 7, 2019 through a SARA Critical Habitat Order made under subsections 58(4) and (5) which invoked the prohibition in subsection 58(1) against the destruction of the identified critical habitat (section 2.3).

An evaluation is provided in section 3 of the socio-economic costs of the action plan and the benefits to be derived from its implementation.

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# 1. Recovery actions

## 1.1 Context and scope of the action plan

The Nooksack Dace (*Rhinichthys cataractae* ssp.) was listed as Endangered under the Species at Risk Act (SARA) in 2003 and the Salish Sucker (*Catostomus* sp. cf. *catostomus*) was reclassified as Threatened under SARA in 2019.

This action plan is considered one in a series of documents that are linked and should be taken into consideration together with the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) status reports (COSEWIC 2019, 2013), the recovery potential assessments (DFO 2008a, 2015), and the amended recovery strategies (DFO 2020a, b). Under SARA, an action plan provides the detailed recovery planning that supports the strategic direction set out in a recovery strategy for the species. A recovery strategy also provides background information on the species and its threats and critical habitat information.

An initial action plan for the Nooksack Dace and Salish Sucker was posted on the Species at Risk Public Registry in 2017 (DFO 2017). This 2020 action plan updates the 2017 action plan to reflect changes made in the amended recovery strategies for the species (DFO 2020a, b). Changes have been made to the Measures to be Taken and Implementation Schedule (section 1.2). In this amendment, new recovery measures have been added, existing measures have been refined and streamlined, and measures have been re-prioritized.

This action plan addresses the entire distribution of the Nooksack Dace and the Salish Sucker in Canada.

The Nooksack Dace is a small minnow specializing in riffle habitat. Nooksack Dace are known from the Brunette River, Bertrand Creek, Fishtrap Creek and Pepin Creek (Brook) watersheds in British Columbia, Canada. Section 4.2 of the amended recovery strategy (DFO 2020a) provides further information on the distribution of Nooksack Dace. Section 5 of the amended recovery strategy identifies key threats to the species: sediment deposition, seasonal lack of water, harmful substances, physical destruction of habitat, hypoxia, riffle loss to impoundment and habitat fragmentation.

The Salish Sucker is a small fish found in headwater marshes, ponds and riffles. Salish Sucker are known from the Salwein Creek / Hopedale Slough, Chilliwack Delta (Atchelitz / Chilliwack / Semmihault Creek), Elk Creek / Hope Slough, Bertrand Creek, Fishtrap Creek, Pepin Creek, Salmon River, Mountain Slough, Agassiz Slough, Miami Creek and Little Campbell River watersheds in British Columbia, Canada. Section 4.2 of the amended recovery strategy (DFO 2020b) provides further information on the distribution of Salish Sucker. Section 5 of the amended recovery strategy identifies key threats to the species: hypoxia, seasonal lack of water, harmful substances, sediment deposition, habitat fragmentation, physical destruction of habitat and increased predation from aquatic invasive species.

The population and distribution objectives for the Nooksack Dace and Salish Sucker are outlined in section 6 of the species' respective amended recovery strategies (DFO 2020a, b).

Under section 47 of SARA, the competent minister must prepare one or more action plans based on the recovery strategy. Therefore, action planning for species at risk recovery is an iterative process. The Implementation Schedule, including the recovery measures, outlined in

this action plan may be updated in the future through an amendment to this action plan or development of another action plan, depending on the progression towards recovery.

## 1.2 Measures to be taken to implement the recovery strategy

Successful recovery of this species is dependent on the actions of many different jurisdictions. It requires the commitment and cooperation of the constituencies that will be involved in implementing the directions and measures set out in this action plan.

This action plan provides a description of the measures that provide the best chance of achieving the population and distribution objectives for the Nooksack Dace and Salish Sucker. It includes measures to be taken to address threats to the species and monitor its recovery, and guides not only activities to be undertaken by DFO but those for which other jurisdictions, organizations and individuals have a role to play. As new information becomes available, these measures and the priority of these measures may change. DFO strongly encourages all Canadians to participate in the conservation of the Nooksack Dace and Salish Sucker by undertaking measures outlined in this action plan. DFO recognizes the important role of the recovery team for the Nooksack Dace and Salish Sucker and its member organizations and agencies in the implementation of measures for this species.

Table 1 identifies the measures to be undertaken by DFO to support the recovery of the Nooksack Dace and Salish Sucker.

Table 2 identifies the measures to be undertaken collaboratively between DFO and its partners, other agencies, organizations or individuals. Implementation of these measures will be dependent on a collaborative approach, in which DFO is a partner in recovery efforts, but cannot implement the measures alone.

As all Canadians are invited to join in supporting and implementing this action plan, table 3 identifies the remaining measures that represent responsibilities and/or opportunities for other jurisdictions, organizations or individuals to lead. If your organization is interested in participating in one of these measures, please contact the [Species at Risk Pacific Region office](#).

Federal funding programs for species at risk that may provide opportunities to obtain funding to carry out some of the outlined activities include the [Canada Nature Fund for Aquatic Species at Risk](#), the [Habitat Stewardship Program for Species at Risk](#), and [the Aboriginal Fund for Species at Risk Program](#).

For each of the recovery measures identified in the following tables, a priority is assigned that reflects the degree to which the measure is expected to contribute to the recovery of the species:

- "high" priority measures are considered likely to have an immediate and/or direct influence on the recovery of the species
- "medium" priority measures are important but considered to have an indirect or less immediate influence on the recovery of the species
- "low" priority measures are considered important contributions to the knowledge base about the species and mitigation of threats

The tables also identify the timelines for recovery measures. In this amendment, new recovery measures have been added<sup>1</sup>, existing measures have been refined and streamlined<sup>2</sup>, and measures have been re-prioritized<sup>3</sup>.

### **Broad strategies**

The broad strategies and approaches to recovery referenced in the tables below were outlined in the amended recovery strategies for Nooksack Dace and Salish Sucker (DFO 2020a, b). It is important to note that many of the recovery measures relate to more than one broad strategy or approach for recovery.

Broad strategy 1: inventory and monitoring

Approach 1-A: monitor recovery

Broad strategy 2: research

Approach 2-B: fill knowledge gaps that inhibit recovery

Broad strategy 3: management and coordination

Approach 3-C: reduce sediment entry to instream habitats

Approach 3-D: minimize entry of harmful substances to instream habitats

Approach 3-E: reduce fragmentation of instream habitats

Approach 3-F: ensure the integrity and proper function and reduce the fragmentation of riparian areas throughout watersheds

Approach 3-G: protect existing habitat, restore lost or degraded habitat, and create new habitat

Approach 3-H: establish and maintain adequate base flow (Nooksack Dace) and water depth (Salish Sucker) in all habitats with high potential productivity

Approach 3-I: reduce incidence of severe hypoxia in instream critical habitat

Broad strategy 4: stewardship and outreach

Approach 4-J: encourage stewardship amongst private landowners, local governments and the general public

Approach 4-K: support stewardship projects to increase awareness of aquatic invasive species

Broad strategy 5: international collaboration

Approach 5-L: explore opportunities for coordinating population assessment and recovery efforts with interested groups in the United States

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<sup>1</sup> The following recovery measures are new: 2, 3, 4, 9, 14, 17, 21, and 22.

<sup>2</sup> The following recovery measures have been refined and streamlined: 7, 10, 11, 12, 15, 19, 20, 22, 24, 25, and 34.

<sup>3</sup> The following recovery measures have been re-prioritized: 8, 20, 30, 31, 32, and 33.

### 1.2.1 Implementation schedules

**Table 1. Measures to be undertaken by Fisheries and Oceans Canada (DFO)**

#	Recovery measure	Approach	Priority	Threats or concern addressed	Status / timeline
1	Develop protocols for monitoring Nooksack Dace and Salish Sucker recovery, including watershed-level assessments of the populations of both species as needed. Explore options for incorporating any available information on ecological benefits provided to other species by Nooksack Dace and Salish Sucker recovery efforts into monitoring reports.	1-A	High	Need to monitor species' recovery and long-term viability	2020 to 2024
2	Improve quantitative sampling methods to monitor recovery of Nooksack Dace populations.	1-A	High	Need to monitor species' recovery and long-term viability	Underway, anticipated completion by 2024
3	Survey for undocumented populations of Nooksack Dace and Salish Sucker in streams near documented populations that may contain suitable habitat.	1-A	Medium	Need to monitor species' recovery and long-term viability	Underway, anticipated completion by 2023
4	Track annual extent of drainage maintenance works affecting critical habitat of Nooksack Dace and Salish Sucker.	2-B	Medium	Physical destruction of habitat	Ongoing
5	Identify high priority areas in watersheds where Nooksack Dace or Salish Sucker are present for in-stream habitat restoration or creation projects, sediment mitigation projects, and riparian planting projects that would benefit Nooksack Dace, Salish Sucker or both species.	3-E, 3-F, 3-G	High	Physical destruction of habitat, habitat fragmentation, hypoxia, sediment deposition, harmful substances, riffle loss to impoundment (Nooksack Dace)	Ongoing

#	Recovery measure	Approach	Priority	Threats or concern addressed	Status / timeline
6	Provide information and advice related to results of habitat restoration projects to stewardship groups, agencies and consultants involved in similar works in order to increase the value of such projects for both species and ensure that features that benefit either or both species can be incorporated into habitat projects directed at other species.	3-E, 3-F, 3-G	High	Physical destruction of habitat, habitat fragmentation, hypoxia, sediment deposition, harmful substances, riffle loss to impoundment (Nooksack Dace)	Ongoing
7	Identify watersheds vulnerable to inadequate base flow for Nooksack Dace and water depth for Salish Sucker.	3-H	High (Nooksack Dace) Medium (Salish Sucker)	Seasonal lack of water, habitat fragmentation	Underway, anticipated completion by 2022 (Nooksack Dace)  Underway, anticipated completion by 2023 (Salish Sucker)
8	Pursue the negotiation of stewardship agreements under SARA or other forms of conservation agreements with interested agencies, organizations or individuals regarding actions that will support the recovery of Nooksack Dace and/or Salish Sucker, including habitat restoration and management.	4-J	Low	All	2021 to 2025

**Table 2. Measures to be undertaken collaboratively between Fisheries and Oceans Canada (DFO) and its partners**

#	Recovery measure	Approach	Priority	Threats or concern addressed	Status / timeline	Lead and partner(s)
9	Implement protocols for monitoring Nooksack Dace and Salish Sucker recovery.	1-A	High	Need to monitor species' recovery and long-term viability	2020 to 2024	DFO, local, regional and provincial governments, stewardship groups, academia
10	Identify sediment sources and quantify sediment accumulation in riffles in watersheds containing Nooksack Dace or Salish Sucker.	2-B	High (Nooksack Dace) Medium (Salish Sucker)	Sediment deposition	2020 to 2024	DFO, local, regional and provincial governments, stewardship groups, academia
11	Determine levels and types of sediment in riffles that are harmful to Nooksack Dace and Salish Sucker.	2-B	High (Nooksack Dace) Medium (Salish Sucker)	Sediment deposition	Completed 2017 (Nooksack Dace) 2020 to 2022 (Salish Sucker)	DFO, local, regional and provincial governments, stewardship groups, academia
12	Identify biologically based minimum in-stream flows (Nooksack Dace) and water depth (Salish Sucker) in habitats with high potential productivity.	2-B	High (Nooksack Dace) Medium (Salish Sucker)	Seasonal lack of water	Completed 2017 (Nooksack Dace) Underway, anticipated completion by 2022 (Salish Sucker)	DFO, local, regional and provincial governments, academia, stewardship groups

#	Recovery measure	Approach	Priority	Threats or concern addressed	Status / timeline	Lead and partner(s)
13	Analyze, and re-assess as needed, data on the extent and severity of hypoxia, its relationship with in-stream flows, land use and Salish Sucker population levels. Ensure research results are shared with interested groups.	2-B	High	Hypoxia	Underway, anticipated completion by 2022	DFO, provincial government, academia, stewardship groups
14	Collect detailed seasonal oxygen profiles for selected Salish Sucker critical habitat reaches.	2-B	High	Hypoxia	2020 to 2022	DFO, local, regional and provincial governments, stewardship groups, academia
15	Estimate the extent and severity of harmful substances in watersheds where Nooksack Dace or Salish Sucker are present. Where possible, identify possible sources of contamination and engage relevant agencies, stewardship groups and landowners regarding reducing or eliminating these sources.	3-D	Medium	Harmful substances	Ongoing	DFO, local, regional and provincial governments, stewardship groups, industry, landowners
16	Develop, implement and monitor in-stream habitat restoration or creation projects, sediment mitigation projects, and riparian planting projects that will benefit Nooksack Dace, Salish Sucker or both species.	3-E, 3-F, 3-G	High	Physical destruction of habitat, habitat fragmentation, hypoxia, sediment deposition, harmful substances, riffle loss to impoundment (Nooksack Dace)	Ongoing	DFO, local, regional and provincial governments, stewardship groups, landowners

#	Recovery measure	Approach	Priority	Threats or concern addressed	Status / timeline	Lead and partner(s)
17	<ul style="list-style-type: none"> <li>Identify beaver management protocols and practices that increase flow without degrading or physically destroying pool or riffle habitats used by Nooksack Dace in watersheds where they are present; and</li> <li>map the extent of beaver and human impoundments of critical habitat for Nooksack Dace in Pepin Creek.</li> </ul>	3-E, 3-F, 3-G	High	Physical destruction of habitat, habitat fragmentation, sediment deposition, riffle loss to impoundment (Nooksack Dace)	2019 to 2022	DFO, local governments, stewardship groups, academia
18	<ul style="list-style-type: none"> <li>Ensure that Nooksack Dace and Salish Sucker needs are included as targets of existing incentive programs that support and promote riparian planting, in-stream habitat restoration projects and the voluntary adoption of beneficial land management practices by private landowners;</li> <li>explore possible mechanisms for additional incentives to encourage private landowners to undertake riparian planting or in-stream habitat restoration projects that benefit Nooksack Dace or Salish Sucker; and</li> <li>explore options for overcoming barriers that may reduce landowners' willingness to undertake such actions and projects.</li> </ul>	3-E, 3-F, 3-G	High	Hypoxia, habitat fragmentation, sediment deposition, harmful substances	2019 to 2024	DFO, local, regional and provincial governments, stewardship groups, landowners



#	Recovery measure	Approach	Priority	Threats or concern addressed	Status / timeline	Lead and partner(s)
19	Engage interested agencies, groups and individuals in order to develop and negotiate conservation agreements under SARA or other management agreements to ensure that minimum in-stream flow (Nooksack Dace) and water depth (Salish Sucker) requirements are met in habitats with high potential productivity.	3-H	High (Nooksack Dace) Medium (Salish Sucker)	Seasonal lack of water, habitat fragmentation	2020 to 2025	DFO, local, regional and provincial governments, stewardship groups, landowners
20	Develop and encourage voluntary adoption of habitat enhancement guidelines for Nooksack Dace, Salish Sucker and co-occurring species at risk.	4-J	Medium	Physical destruction of habitat, habitat fragmentation	2020 to 2024	DFO, local, regional and provincial governments, stewardship groups
21	Work with stakeholders in Washington to understand transboundary population structure and movements in Bertrand Creek, Fishtrap Creek and Pepin Creek.	5-L	Low	All	As opportunities arise	DFO, local, regional and provincial governments, stewardship groups

**Table 3. Measures that represent responsibilities and/or opportunities for other jurisdictions, organizations or individuals to lead**

#	Recovery measure	Approach	Priority	Threats or concern addressed	Potential / confirmed jurisdictions or organizations
22	Characterize the impacts of introduced predators on the mortality and habitat use by different life stages of Salish Sucker.	2-B	Low	Increased predation from aquatic invasive species (Salish Sucker)	Local, regional and provincial governments, stewardship groups, academia
23	Undertake projects to prevent and mitigate sedimentation of riffles from urban, agricultural and industrial sources.	3-C	High (Nooksack Dace) Medium (Salish Sucker)	Sediment deposition	Local, regional and provincial governments, stewardship groups, industry, landowners
24	Undertake projects to reduce harmful substances of local watersheds by storm water or other sources, including development of settling ponds in urban areas.	3-D	Medium	Harmful substances	Local, regional and provincial governments, industry
25	Adopt practices to reduce or eliminate sources of harmful substances for local watersheds, including practices related to pesticide and herbicide application and use and spill response planning.	3-D	Medium	Harmful substances	Local, regional and provincial governments, industry, landowners
26	Undertake mitigation for permanent and/or seasonal barriers to Nooksack Dace and Salish Sucker movement such as perched or undersize culverts.	3-E, 3-F, 3-G	Medium	Habitat fragmentation	Local, regional and provincial governments, stewardship groups, industry, landowners

#	Recovery measure	Approach	Priority	Threats or concern addressed	Potential / confirmed jurisdictions or organizations
27	Promote or support the inclusion of Nooksack Dace and Salish Sucker habitat needs in existing incentive programs that support and promote in-stream habitat restoration or creation projects, sediment mitigation projects, and riparian planting projects and the adoption of land management practices by private landowners.	3-E, 3-F, 3-G	High	Physical destruction of habitat, hypoxia, sediment deposition, habitat fragmentation, harmful substances, riffle loss to impoundment (Nooksack Dace)	Local, regional and provincial governments, stewardship groups, landowners
28	Consider the needs of Nooksack Dace and Salish Sucker in Official Community Plans, and implement projects to manage discharge rates and maintain adequate water quantity.	3-H	High	Seasonal lack of water	Local and regional governments
29	Adopt or continue to apply beneficial nutrient management practices, urban design practices and/or water management practices that reduce nutrient loading in watersheds where Salish Sucker are present.	3-I	High	Hypoxia	Local, regional and provincial governments, stewardship groups, industry, landowners
30	Develop a stewardship and engagement strategy for Nooksack Dace and Salish Sucker to increase efficiency and effectiveness of stewardship actions, including incorporating information about Nooksack Dace and Salish Sucker into existing stewardship initiatives.	4-J	Medium	All	DFO, local, regional and provincial governments, stewardship groups, industry, landowners
31	Consider entering into a stewardship agreement under SARA or another type of conservation agreement regarding actions that will support the recovery of Nooksack Dace and/or Salish Sucker, including habitat restoration and management.	4-J	Low	All	Industry, stewardship groups, landowners

#	Recovery measure	Approach	Priority	Threats or concern addressed	Potential / confirmed jurisdictions or organizations
32	Develop and provide public education materials and information on Nooksack Dace, Salish Sucker, watershed ecology and actions that individuals and groups can take to benefit both species to landowners, members of the public and interested groups through presentations, field tours, landowner contact programs or other outreach tools.	4-J	Low	All	Local, regional and provincial governments, stewardship groups, landowners
33	Consider and incorporate Nooksack Dace and Salish Sucker needs in new and existing plans, programs, strategies, and stewardship initiatives for the management of watersheds where either or both species is present.	4-J	Low	All	Local, regional and provincial governments, stewardship groups
34	Develop and implement stewardship projects that include the public education materials and information to recreational fishers and other relevant groups on the impacts that introduced predators can have on Salish Sucker and local watershed ecology.	4-K	Low	Increased predation from aquatic invasive species (Salish Sucker)	Local, regional and provincial governments, stewardship groups

## **2. Critical habitat**

### **2.1 Identification of the species' critical habitat**

#### **2.1.1 General description of the species' critical habitat**

Critical habitat is defined in SARA as "...the habitat that is necessary for the survival or recovery of a listed wildlife species and that is identified as the species' critical habitat in the recovery strategy or in an action plan for the species." [subsection 2(1)]

Also, SARA defines habitat for aquatic species as "... spawning grounds and nursery, rearing, food supply, migration and any other areas on which aquatic species depend directly or indirectly in order to carry out their life processes, or areas where aquatic species formerly occurred and have the potential to be reintroduced." [subsection 2(1)]

Critical habitat for Nooksack Dace is identified to the extent possible in section 8.1 of the species' amended recovery strategy (DFO 2020a). Critical habitat for Salish Sucker is identified to the extent possible in section 8.1 of the species' amended recovery strategy (DFO 2020b). The recovery strategies also contain details about the identified critical habitat including geographic location and biophysical functions, features and attributes.

### **2.2 Examples of activities likely to result in the destruction of critical habitat**

Examples of activities likely to result in destruction of critical habitat may be found in section 8.3 of the amended recovery strategies for Nooksack Dace and Salish Sucker (DFO 2020a, b).

### **2.3 Proposed measures to protect critical habitat**

Under SARA, critical habitat must be legally protected from destruction within 180 days of being identified in a final recovery strategy or action plan. In August 2020, the 2016 SARA Critical Habitat Order was amended to reflect the changes to Nooksack Dace critical habitat in the amended recovery strategy (DFO 2020a). For Salish Sucker, legal protection of identified critical habitat was accomplished on August 7, 2019 through a SARA Critical Habitat Order made under subsections 58(4) and (5), which invoked the prohibition in subsection 58(1) against the destruction of critical habitat .

## **3. Evaluation of socio-economic costs and of benefits**

SARA requires the competent minister to undertake an evaluation of the socio-economic impacts of the action plan. The evaluation includes the socio-economic "costs of the action plan and the benefits to be derived from its implementation" (SARA paragraph 49(1)(e)). This evaluation addresses only the incremental impacts of 'new' recovery measures (that is, measures that have not yet been implemented) outlined in this action plan. This evaluation does not address any 'underway' measures (that is, measures that were initiated or implemented prior to the development of the action plan, but have not yet been completed). 'Underway' measures are not considered as incremental costs to the government and other stakeholders, as these measures were being undertaken or were initiated prior to the development of the

action plan (for example, research studies to identify critical habitat). The specific costs and benefits associated with this action plan are described below.

This evaluation does not address the socio-economic impacts of protecting critical habitat for the Nooksack Dace and Salish Sucker. Under SARA, DFO must ensure that critical habitat identified in a recovery strategy or action plan is legally protected within 180 days of the final posting of the recovery strategy or action plan. Where a SARA Critical Habitat Order will be used for critical habitat protection, the development of the Order will follow a regulatory process in compliance with the Cabinet Directive on Regulatory Management (CDRM), including an analysis of any potential incremental impacts of the SARA Critical Habitat Order that will be included in the Regulatory Impact Analysis Statement. As a consequence, no additional analysis of the critical habitat protection has been undertaken for the assessment of costs and benefits of this action plan.

### 3.1 Socio-economic impacts of implementing this action plan

Recovery actions for Nooksack Dace and Salish Sucker began with their legal listing under SARA in 2003 and 2005, respectively. Activities related to habitat identification research, habitat restoration, habitat enhancement and stewardship actions for Salish Sucker and Nooksack Dace are already being undertaken by DFO, the Province of British Columbia, the Fraser Valley Conservancy, Langley Environmental Partners Society, universities and other partners and stakeholders.

#### Benefits

The benefits of recovery actions to maintain Nooksack Dace and Salish Sucker populations outlined in this action plan are unknown but likely positive. Beyond the unquantifiable non-market benefits of species recovery, the recovery actions are also likely to provide broader ecosystem benefits, which in turn provide non-market benefits. Salish Sucker recovery actions that increase oxygen levels in the water and create complex deep pool habitats may also benefit two SARA listed species, Oregon Spotted Frog (*Rana pretiosa*) and Western Painted Turtle (*Chrysemys picta*) (DFO 2020b). Actions to protect and restore riparian vegetation may also benefit other SARA-listed species, including the Pacific Water Shrew (*Sorex bendirii*), Red-legged Frog (*Rana aurora*), Western Toad (*Bufo boreas*), Mountain Beaver (*Aplodontia rufa*), Oregon Forestsnail (*Allogona townsendiana*), Vancouver Island Beggarticks (*Bidens amplissima*), and Great Blue Heron (*Ardea herodias fannini*) (DFO 2020a, b). Finally, Nooksack Dace and Salish Sucker recovery actions may benefit co-occurring native species including Steelhead (*Oncorhynchus mykiss*), Cutthroat Trout (*Oncorhynchus clarkii clarkii*), and Coho Salmon (*Oncorhynchus kisutch*) (DFO 2020a, b).

#### Costs

The measures of the plan include research, monitoring and assessment activities, stewardship and engagement activities. Research activities are focused on gathering information on drainage maintenance works; in-stream flow needs and vulnerable watersheds; sediment sources and levels and hypoxia threats. Monitoring actions will indicate progress towards meeting population and distribution objectives and are to be undertaken on an ongoing basis. Stewardship and engagement actions support and promote riparian planting, in-stream habitat restoration projects and the voluntary adoption of habitat enhancement and beneficial land management practices by private landowners. These stewardship measures can be undertaken

on a voluntary basis by groups, as opportunities arise. Most measures are anticipated for the duration of the action plan while some are one-time actions.

The implementation schedule separates recovery measures into three tables. Table 1 includes measures to be undertaken by DFO with the full costs potentially being borne by the Government of Canada. Table 2 includes measures to be undertaken collaboratively between DFO and partners; the costs of these measures would be borne jointly by government and partners. The measures in table 3 provide opportunities for other jurisdictions, organizations and individuals to support the recovery of Nooksack Dace and Salish Sucker; these costs would be borne primarily by parties other than the Government of Canada. Government of Canada costs would come from existing allocations.

The present value of DFO costs of actions is estimated to be up to \$400,000 over the ten year analysis period. The present value of the direct cost to partners, organizations and individuals, other than the Federal Government is estimated to be up to \$350,000. Additional, but low, in-kind costs are also anticipated for partners related to attendance at meetings and for collaboration on documents.

Overall, the costs of this action plan are considered low (less than \$1 million present value) and the benefits are expected to be positive. The benefits are expected to accrue to all Canadians while the costs are distributed to the federal government, provincial partners and stewardship groups with up to 50% of costs being borne by the Government of Canada.

## **4. Measuring progress**

### **4.1 Monitoring species' recovery**

The recovery measures outlined in this action plan will help to achieve the population and distribution objectives described in the amended recovery strategies for Nooksack Dace and Salish Sucker (DFO 2020a, b) and advance the recovery of both species in Canada. The performance indicators presented in the recovery strategies provide a way to define and measure progress toward achieving the population and distribution objectives. Measures 1 to 3 and 10 in this action plan will increase our understanding of the species and their status, and contribute to monitoring of the Nooksack Dace and Salish Sucker in Canada. This monitoring information will be used to produce future Reports on the Progress towards Recovery Strategy Implementation.

### **4.2 Reporting on the implementation of the action plan**

The Minister will monitor the implementation of the action plan, and progress towards meeting its objectives, by assessing progress towards completing the recovery measures identified in this action plan (under section 55 of SARA), and the Minister will report on the plan's implementation five years after it comes into effect. This information will be published in a report on the progress towards action plan implementation in five years and will be included in the public registry.

### **4.3 Reporting on ecological and socio-economic impacts**

Ecological impacts may be defined as changes in the structure or function of ecosystems. The assessment of ecological impacts may be limited to species, their immediate habitats, or general natural resource categories. The broader ecological impacts of the implementation of this action plan have been considered in its development. In order to report on the ecological impacts of implementation (under section 55 of SARA), monitoring data for one or more ecological components have been identified.

Monitoring activities will confirm existing population and distribution of Nooksack Dace and Salish Sucker, monitor population trends, and provide new information about undocumented populations in streams near documented populations that may contain suitable habitat. These activities will be conducted by DFO as well as through voluntary actions by other jurisdictions organizations, or individuals.

The ecological impacts of the implementation of the action plan will be reported on in the progress report five years after the plan comes into effect, using the monitoring methods outlined above, and will be included in the Species at Risk public registry.

Reporting on the socio-economic impacts of the action plan (under section 55 of SARA) will be achieved by providing information on the costs incurred to implement the action plan.

The Minister must assess and report on its ecological and socio-economic impacts five years after the plan comes into effect. This information will be published in a report on the progress towards action plan implementation in five years and included in the public registry.



## 5. References

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## Appendix A: effects on the environment and other species

In accordance with the [Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals](#) (2010), SARA recovery planning documents incorporate strategic environmental assessment (SEA) considerations throughout the document. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making and to evaluate whether the outcomes of a recovery planning document could affect any component of the environment or achievement of any of the [Federal Sustainable Development Strategy](#)'s goals and targets.

Recovery planning is intended to benefit species at risk and biodiversity in general. However, it is recognized that implementation of recovery measures may also inadvertently lead to environmental effects beyond the intended benefits. The planning process based on national guidelines directly incorporates consideration of all environmental effects, with a particular focus on possible impacts upon non-target species or habitats. The results of the SEA are incorporated directly into the action plan itself, but are also summarized below in this statement.

This action plan will benefit the environment by contributing to the recovery of Nooksack Dace and Salish Sucker. However, effects on other species were also considered. Action 26 in table 2 refers to the identification of habitat management practices or guidelines that consider other species at risk in areas where Nooksack Dace and Salish Sucker co-occur with other species at risk. This will help ensure that actions that are taken to benefit Nooksack Dace and Salish Sucker do not have negative impacts on other species at risk.

The beaver management practices and guidelines referenced in action 17 in table 2 would impact American Beaver (*Castor canadensis*); however, care would be taken to reduce negative effects from the implementation of this recovery measure.

Generally, many of the actions identified in this plan address threats such as hypoxia, sediment deposition, toxicity, habitat fragmentation and introduced predators which negatively impact many aquatic species and amphibians. By addressing these threats, these actions will provide benefits to any such species that are present in watersheds where Nooksack Dace and Salish Sucker are present.

Fish species that co-occur with Salish Sucker and / or Nooksack Dace and may benefit from these actions include Steelhead (*Oncorhynchus mykiss*), Cutthroat Trout (*Oncorhynchus clarkii clarkii*) and Coho Salmon (*Oncorhynchus kisutch*).

SARA-listed species that co-occur with Salish Sucker and/or Nooksack Dace and may benefit from recovery actions for Nooksack Dace and Salish Sucker include Oregon Spotted Frog (*Rana pretiosa*), Western Painted Turtle (*Chrysemys picta*), Pacific Water Shrew (*Sorex bendirii*), Red-legged Frog (*Rana aurora*), Western Toad (*Bufo boreas*), Mountain Beaver (*Aplodontia rufa*), Oregon Forestsnail (*Allogona townsendiana*), Vancouver Island Beggarticks (*Bidens amplissima*), and Great Blue Heron (*Ardea herodias fannini*).

These actions will also contribute to overall ecosystem and watershed health, which will provide benefits to many species and ecological services to Canadians living in these areas. Given the considerations outlined above, the benefits of this action plan to the environment and other species are expected to far outweigh any adverse effects that may occur.

## Appendix B: record of cooperation and consultation

Action plans are to be prepared in cooperation and consultation with other jurisdictions, organizations, affected parties and others as outlined in SARA section 48. Fisheries and Oceans Canada (DFO) consulted extensively in the development of the 2017 action plan and has utilized a process of external review to seek input for the development of this amended action plan. Information on participation is included below.

The Nooksack Dace and Salish Sucker are listed as Endangered and Threatened species, respectively, on Schedule 1 of the *Species at Risk Act* (SARA). As aquatic species, they fall under federal jurisdiction, and are managed by DFO.

DFO and the Province of British Columbia cooperated on the development of the original action plan (DFO 2017). Processes for coordination and consultation between the federal and British Columbian governments on management and protection of species at risk are outlined in the Canada-British Columbia Agreement on Species at Risk (Government of Canada 2005).

Consultations on the original draft action plan (DFO 2017) occurred between February 6 and March 12, 2012. Consultation activities included:

- online posting of the draft action plan, a fact sheet on critical habitat protection and comment form
- letters, emails and faxes with information on the draft action plan consultations and offering opportunities for bilateral meetings sent to 30 Indigenous organizations
- letters regarding the draft action plan consultations sent to over 3000 private landowners
- emails regarding the action plan consultations sent to over 300 stakeholders including agriculture associations, the agricultural industry, industry (such as the aggregate mining industry), utility companies, environmental non-government organizations, community stewardship groups, municipal governments, and representatives from the provincial and federal government
- four face to face workshops held in Chilliwack and Burnaby with agriculture, local government, stewardship groups, utility companies and federal and provincial government representatives
- four community open house sessions held in Burnaby, Chilliwack, Aldergrove and Harrison Hot Springs
- public notices regarding the community open houses and action plan consultations published in local papers
- distribution of feedback forms and fact sheets on critical habitat protection at workshops and open house sessions

Approximately 160 people participated in the community open houses and face to face workshops held in Burnaby, Chilliwack, Harrison Hot Springs and Aldergrove. Twenty-two people submitted comments and feedback on elements of the draft action plan via email, mail and the online comment form. Seven people or organizations submitted comments and expressed their thoughts via letters to the Minister of Fisheries and Oceans.

Table 4 below provides an overview of some of the key concerns or issues brought up during the February 6 to March 12, 2012 consultations. Please note that different participants expressed different concerns and perspectives; the issues and opinions summarized below may

not be shared by everyone who participated in consultations. The second column in table 3 indicates how the comment relates to the finalized original action plan (DFO 2017).

Additional stakeholder, Indigenous, and public input was sought through the publication of the proposed document on the Species at Risk Public Registry for a 60-day public comment period.

All feedback received was considered in the finalization of the original action plan (DFO 2017).

**Table 4: Summary of key concerns or issues raised during the 2012 consultations and responses in relation to the original action plan (DFO 2017)**

Key concern or comment	Response
Desire for pilot 'showcase' projects and financial incentives for landowners to promote stewardship actions such as habitat restoration that will support species recovery	Action 5 in table 1, actions 16 and 18 in table 2, and actions 29 and 32 in table 3 address the development of pilot projects and financial incentives for habitat restoration.
Various suggestions for how different recovery measures or voluntary actions should be implemented	Suggestions will be taken into consideration during implementation of the relevant recovery measures.
Desire for involvement in action plan implementation	As indicated on page 3, all Canadians are invited to participate in the implementation of this action plan, either by undertaking some of the voluntary actions listed in table 3, participating in table 2's collaborative actions with DFO and its partners, or by partnering with DFO to implement actions identified in table 1.
Concern that organizations outside DFO will not commit to take actions to benefit Nooksack Dace or Salish Sucker	The development of a stewardship and engagement strategy (table 2, #21) and the development of stewardship agreements (table 1, #9) could help address this concern.
Desire for watershed scale planning of recovery actions, so that actions taken to benefit one species do not result in harm to other species	<p>The action plan addresses two species in order to ensure that actions taken to benefit Nooksack Dace do not harm Salish Sucker. Actions 1 and 6 in table 1 specifically address the consideration of the needs of other species at risk.</p> <p>The need for any additional planning at a scale different from that used in this action plan will be considered during action plan implementation.</p>
Various questions and requests for more specific guidance around critical habitat protection	<p>Consultation results and comments related to critical habitat protection will also be reflected in the Regulatory Impact Analysis Statements for the SARA Critical Habitat Orders to protect critical habitat for Nooksack Dace and Salish Sucker.</p> <p>Additional guidance will be developed where needed, to inform landowners and others around management</p>

	practices that could help avoid the destruction of critical habitat.
Desire for additional communication with the public regarding regulatory requirements and compliance promotion efforts	Several actions in both tables address communication and education with landowners and other members of the public. This desire will be considered in the implementation of these actions.
Desire for increased enforcement to encourage compliance with existing regulations and with the SARA Critical Habitat Orders once they are in place	Enforcement requirements for SARA Critical Habitat Orders will be considered and reflected in the Regulatory Impact Analysis Statements for each Order. Comments regarding enforcement of other regulations received during consultations will be shared with relevant DFO sectors and other agencies as appropriate.
Concerns related to the identification of critical habitat	The identification of critical habitat is outside the scope of the action plan. Critical habitat for each species was identified in the recovery strategy for the species. If new scientific information supporting changes to this critical habitat becomes available at some point in the future, the recovery strategy will be updated as appropriate.
Various concerns related to ditch and drainage maintenance	<p>The Stewardship Centre for British Columbia (2013) and partners developed “Species at Risk Voluntary Stewardship Practices” for drainage maintenance in agricultural waterways, among others, which are expected to minimize harm to Nooksack Dace and Salish Sucker habitat. Several actions in tables 1, 2 and 3 also address the issue of nutrient management and riparian planting, which can help address some of the underlying causes of drainage maintenance issues.</p> <p>Other broader concerns related to ditch and drainage maintenance raised during consultations are outside the scope of the action plan. Where possible, comments and concerns have been shared with relevant DFO staff.</p>

A targeted external review of the draft amended action plan was held in April 2018. Input was sought from over 30 Indigenous organizations, however no meeting requests or comments were received.

Input was also sought from local, regional and provincial governments, academia, environmental non-government organizations, and industry. The Province of British Columbia and the BC Dairy Association provided comments related to the agricultural sector, which resulted in minor changes to the amended action plan.

Additional stakeholder, Indigenous organizations and public input was sought through the publication of the proposed document on the Species at Risk Public Registry for a 60-day public comment period from June to August 2020. All feedback received was considered in the finalization of the amended action plan.