

Report on the Progress of Recovery Strategy Implementation for the Speckled Dace (*Rhinichthys osculus*) in Canada for the Period 2018 to 2022

Speckled Dace



2023

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Preface

The *Species at Risk Act* (S.C. 2002, c.29) (SARA), requires reporting on the implementation of the recovery strategy for a species at risk, and on the progress towards meeting its objectives within 5 years of the date when the final recovery strategy was placed on the Species at Risk Public Registry, and in every subsequent 5 year period, until the recovery strategy is no longer required under SARA or the species' recovery is no longer feasible. This reporting must be done by the competent minister.

The Minister of Fisheries and Oceans is the competent minister under SARA for the Speckled Dace and has prepared this progress report.

Reporting on the progress of recovery strategy implementation requires reporting on the collective efforts of the competent minister, provincial and territorial governments and all other parties involved in conducting activities that contribute to the species' recovery. Recovery strategies identify broad strategies and approaches that will provide the best chance of recovering species at risk. Some of the identified strategies and approaches 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 recovery strategy implementation (progress report).

As stated in the preamble to SARA, success in the recovery of species at risk depends on the commitment and cooperation of many different groups that will be involved in implementing the directions set out in the recovery strategy 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 recovery strategy for the benefit of the Speckled Dace and Canadian society as a whole.

Acknowledgments

This progress report was prepared by Emma Branquinho and Maggie Boothroyd with input from Ahdia Hassan and Oliver Barker (Fisheries and Oceans Canada [DFO]). To the extent possible, this progress report has been prepared with inputs from Rowshyra Castaneda (DFO), Paul Grant (DFO), and Greg Wilson (British Columbia Ministry of Water, Land and Resource Stewardship). DFO would also like to express its appreciation to all individuals and organizations who have contributed to the recovery of the Speckled Dace, including the Okanagan Nation Alliance, British Columbia Ministry of Environment and Climate Change Strategy, the Invasive Species Council of British Columbia, Boundary Invasive Species Society, Central Kootenay Invasive Species Society, the Regional District of Kootenay Boundary, and Granby Wilderness Society.

Executive summary

The Speckled Dace (*Rhinichthys osculus*) was listed as endangered under the *Species at Risk Act* (SARA) in 2009. The “Recovery Strategy for the Speckled Dace (*Rhinichthys osculus*) in Canada” was finalized and published on the [Species at Risk Public Registry](#) in 2018.

The main threats identified for the Speckled Dace include: water use from reduced flows in the summer and autumn due to irrigation and other consumptive uses, and inundation and loss of habitat through potential hydro development; industrial land use such as agricultural and forestry activities that increase siltation leading to substrate embeddedness, plus mining activities that can also release harmful substances; invasive piscivorous fish that can increase predation on the Speckled Dace; and, climate change where the impacts on habitat quality and future availability are uncertain.

The population and distribution objective for the Speckled Dace is to: maintain current¹ distribution and abundance within natural fluctuations.

The “Report on the Progress of Recovery Strategy Implementation for the Speckled Dace in Canada for the Period 2018 to 2022” reports on the progress made by Fisheries and Oceans Canada (DFO) and its partners towards implementing the recovery strategy and achieving its objectives. During this time period, progress that has been made includes:

- surveys, inventories, and monitoring of the Speckled Dace to assess presence and abundance, as well as collection of spawning, migratory and seasonal behaviour data
- fish habitat assessment in the Kettle River Watershed, including within the Speckled Dace critical habitat areas in the Kettle and Granby Rivers
- riparian threat assessment in the Kettle River Watershed
- the development of multiple management plans for the Kettle River Watershed, which consider the needs of and/or address threats to local species at risk, including the Speckled Dace
- stewardship and outreach to increase public awareness and mitigate the threat of aquatic invasive species that may threaten the recovery of Speckled Dace
- legal protection of the Speckled Dace’s critical habitat through a SARA critical habitat order in 2018
- publication of the “Action Plan for the Speckled Dace (*Rhinichthys osculus*) in Canada” in 2020

While progress has been made towards addressing the activities identified in the recovery strategy, the performance indicators have been either not met or partially met, and the success of meeting the population and distribution objective is unknown. The status of the species is believed to be stable based on continued observation of the Speckled Dace in monitoring programs, though definitive population abundance and trend data are lacking. Further work is required to support the survival and recovery of the Speckled Dace. Priority next steps include: continuing to consider the recovery needs of the Speckled Dace into land and water use plans, addressing knowledge gaps that inhibit recovery of the species, long-term monitoring to determine population and distribution trends, and completion of the schedule of studies

¹ “Current” refers to the best available knowledge on Speckled Dace as stated in section 3.2 of the recovery strategy (DFO 2018).

identified in the recovery strategy to determine if modification of the critical habitat identification is necessary.

DFO remains committed to recovering the Speckled Dace. The work started and completed to date has built a strong foundation for continued research and recovery of this species over the next reporting period. Progress made to date would not have been achieved without the contribution of our partners. DFO looks forward to continued collaboration and welcomes the participation of additional partners.

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1 Introduction

The “Report on the Progress of Recovery Strategy Implementation for the Speckled Dace in Canada for the Period 2018 to 2022” (herein referred to as progress report) outlines the progress made towards meeting the objectives listed in the “Recovery Strategy for the Speckled Dace (*Rhinichthys osculus*) in Canada” (herein referred to as recovery strategy; [Fisheries and Oceans Canada \[DFO\] 2018](#)) during the indicated time period and is part of 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 reports ([COSEWIC 2002](#); [COSEWIC 2006](#); [COSEWIC 2016](#)), the “Recovery Potential Assessment for Speckled Dace (*Rhinichthys osculus*)” (herein referred to as recovery potential assessment; [DFO 2008](#)), the recovery strategy (DFO 2018), and the “Action Plan for the Speckled Dace (*Rhinichthys osculus*) in Canada” (herein referred to as action plan; [DFO 2020](#)).

Section 2 of the progress report provides an overview of the threats to the species; population and distribution objectives for achieving its recovery; approaches to meeting the objectives; and performance indicators to measure progress towards recovery. For more details, readers should refer back to the recovery strategy (DFO 2018). Section 3 reports on the progress made towards the activities identified in the recovery strategy to support achieving the population and distribution objectives. Section 4 summarizes the progress toward achieving the population and distribution objectives.

2 Background

2.1 COSEWIC assessment summary and threats to the species and its critical habitat

The listing of the Speckled Dace as endangered under the *Species at Risk Act* (SARA) in 2009 was based on information found in the 2006 COSEWIC status report (COSEWIC 2006). Listing the species as endangered led to the development and publication of the recovery strategy in 2018 (DFO 2018). The recovery strategy is consistent with the information provided in the COSEWIC status report (COSEWIC 2016) and further informed by the recovery potential assessment (DFO 2008).

In 2016, COSEWIC re-examined and confirmed the status of the Speckled Dace as endangered (COSEWIC 2016).

Date of Assessment: November 2016

Common Name (population): Speckled Dace

Scientific Name: *Rhinichthys osculus*

COSEWIC Status: Endangered

Reason for Designation: This species reaches its northern limit in south central British Columbia where it is restricted to the Kettle River watershed. While the species has shown some resilience to the effects of drought, it is nevertheless threatened by a combination of low flows due to water extractions and climate change and to forestry and agricultural effluents.

Canadian Occurrence: British Columbia

COSEWIC Status History: Designated special concern in April 1980. Status re-examined and designated endangered in November 2002, April 2006, and in November 2016.

Section 4 of the recovery strategy provides information on the threats to the species' survival and recovery. These threats include:

- habitat loss and/or degradation (general threat: water use)
 - reduced flows in summer and autumn due to irrigation and other consumptive uses
 - inundation and loss of habitat through Cascade Falls hydro development
- water pollution (general threat: industrial land use)
 - increased siltation and substrate embeddedness from agricultural land clearing
 - increased siltation and substrate embeddedness from forestry activities
 - harmful substances and sediment releases, and substrate embeddedness from mining activities
- aquatic invasive species (general threat: invasive plants, animals and microorganisms)
 - increased predation by piscivorous fish
- climate change (general threat: changes in precipitation and temperature)
 - changes in hydrograph, temperature, cover and stream morphology

Critical habitat for the Speckled Dace has been identified, to the extent possible, in section 7 of the recovery strategy. The recovery strategy also provides examples of activities that are likely to result in the destruction of critical habitat (that is, threats to critical habitat). The list of activities provided in table 5 of the recovery strategy is neither exhaustive nor exclusive, and its inclusion has been guided by the relevant threats to habitat described in the recovery strategy. For more details on the activities likely to result in the destruction of critical habitat, consult the recovery strategy.

2.2 Recovery

This section summarizes the information from the recovery strategy on the population and distribution objectives necessary for the recovery of the Speckled Dace, and on performance

indicators that provide a way to define and measure progress toward achieving the population and distribution objectives.

Section 5 of the recovery strategy identified the following population and distribution objective necessary for the recovery of the species:

- maintain current² distribution and abundance within natural fluctuations

Section 8 of the recovery strategy includes the following performance indicators:

- a sustained summer adult abundance greater than 7,000 individuals confirmed within each of the 3 river sections identified as critical habitat starting in 2015
- continued presence of adult Speckled Dace in summer confirmed in appropriate sites outside the 3 river sections identified as critical habitat starting in 2015

3 Progress towards recovery

The recovery strategy for the Speckled Dace (DFO 2018) divides the recovery effort into 9 broad strategies:

- 1) increase understanding of population and distribution trends, natural variability, and any linkages to threats
- 2) clarify threats associated with water use in the West Kettle, Kettle and Granby watersheds
- 3) study the relationship between discharge and Speckled Dace productivity to help replace assumptions with direct observations
- 4) support local stewardship groups to advance Speckled Dace recovery
- 5) work towards preventing entry of aquatic invasive species into Speckled Dace range above Cascade Falls
- 6) research diet of juveniles less than 18 mm
- 7) research importance of embeddedness and relate to threats that create embeddedness
- 8) research spawning, night-time, overwintering and migratory behaviour
- 9) clarify impacts of rangeland operations, including nutrient loading

Progress in carrying out these broad strategies is reported in section 3.1. Section 3.2 reports on the activities identified in the schedule of studies to identify critical habitat. Section 3.3 reports on the progress in meeting the performance indicators and other commitments (for example, action plan and critical habitat order) identified in the recovery strategy and information obtained through implementing the recovery strategy.

² "Current" refers to the best available knowledge on Speckled Dace as stated in section 3.2 of the recovery strategy (DFO 2018).

3.1 Activities supporting recovery

Table 1 provides information on the implementation of activities undertaken to address the broad strategies identified in the recovery planning table of the recovery strategy.

Table 1. Details of activities supporting the recovery of the Speckled Dace from 2018 to 2022.

#	Broad strategy	Descriptions and results	Participants ³
1	Increase understanding of population and distribution trends, natural variability, and any linkages to threats	<p>Golder Associates Ltd. completed fish inventory and fish habitat assessments in Speckled Dace critical habitat in the West Kettle River in 2019. This work was completed as part of a riverbank armouring project. Sampling methods included snorkel surveys, minnow trapping, and dip-netting (Golder Associates Ltd. 2019). Results included:</p> <ul style="list-style-type: none"> • 4 Speckled Dace observed during snorkel surveys; 21 Speckled Dace captured in minnow traps; and 7 Speckled Dace captured in dip-nets • evidence of Speckled Dace spawning was observed (spawning coloration in adults and newly emerged fry) <p>Okanagan Nation Alliance (ONA) received funding for a 3-year project (2021 to 2024) through the Habitat Stewardship Program to conduct monitoring and habitat assessments within the Kettle River Watershed to clarify threats to the Speckled Dace. Index surveys were conducted at 16 sites: 4 in the West Kettle River, 8 in the Kettle River, and 4 in the Granby River; with at least 1 site in each river upstream of the known distribution (Smith and Heetebrij 2023). Snorkel surveys were conducted within the Granby River critical habitat area. Results from 2021 included:</p> <ul style="list-style-type: none"> • 177 Speckled Dace were captured during index surveys using backpack electrofishing (20 in the West Kettle River, 20 in the Kettle River upstream of the West Kettle River confluence, 109 in the Kettle River downstream of the West Kettle River confluence, and 28 in the Granby River) • Speckled Dace were captured at 13 of 16 sites, including captures in the Kettle River and West Kettle River critical habitat areas • no Speckled Dace were observed during snorkel surveys in the Granby River critical habitat area 	<p>Golder Associates Ltd., ONA, Fisheries and Oceans Canada (DFO), industry</p>

³ Lead participant(s) in bold; other participants are listed alphabetically. Not all activities have specific participants identified.

#	Broad strategy	Descriptions and results	Participants ³
		<ul style="list-style-type: none"> • 1 Speckled Dace was captured upstream of the known distribution in the Kettle River, while no Speckled Dace were captured upstream of the known distribution in the West Kettle and Granby Rivers • no aquatic invasive species (AIS) were detected <p>DFO conducted pole seine surveys to estimate the density and total abundance of Speckled Dace within a 1.432 km length of the West Kettle River critical habitat area in 2015 (MacConnachie et al. 2023). Results include:</p> <ul style="list-style-type: none"> • the average density of Speckled Dace was 6.27 per linear metre of river (standard error = 1.98) • the mean population estimate for the length of the surveyed area was 8,978 (ranging from 6,143 to 11,814) and the mean population estimate for the 2.4 km length of critical habitat area in the West Kettle River was 15,048 (ranging from 10,296 to 19,800) • based on mean fork length and adult/juvenile size differentiation, 1,014 adults were estimated within the survey area, with an estimated average of 708 adults/km <p>DFO has developed a DNA metabarcoding assay to differentiate Speckled Dace from other dace species.</p> <p>Guidelines on monitoring protocols for the Speckled Dace were not developed during this reporting period, however, all Speckled Dace sampling adheres to the handling guidelines developed for Nooksack Dace (<i>Rhinichthys cataractae</i>) (Pearson 2015).</p>	
2	Clarify threats associated with water use in the West Kettle, Kettle and Granby watersheds	The fish inventory and habitat assessments for the Speckled Dace conducted by Golder Associates Ltd. (refer to table 1: row 1) were within a 1.193 km long section of the 2.4 km critical habitat parcel in the West Kettle River in 2019 (Golder Associates Ltd. 2019). This work was completed as part of a riverbank armouring project at a tailings storage facility within Speckled Dace critical habitat. Glide habitat was observed to contain anthropogenic and natural disturbance and the main disturbance indicators throughout the mainstem section were the presence of eroding banks and lack of pools.	ONA, RDKB, Golder Associates Ltd., Granby Wilderness Society, industry, Ministry of Environment

#	Broad strategy	Descriptions and results	Participants ³
		<p>ONA’s monitoring and habitat assessment project (refer to table 1: row 1) conducted habitat assessments at index sites, including within each critical habitat area in the Kettle and Granby Rivers. Canadian Aquatic Biomonitoring Network (CABIN) survey sites were also established and sampled upstream or in the critical habitat areas in the West Kettle, Kettle and Granby Rivers. Results of the CABIN surveys indicated water quality as “Excellent” in the West Kettle and Kettle Rivers, and “Very Good” in the Granby River. Analysis of the habitat assessment data, collected at 14 of the 16 sites, is planned but not yet available.</p> <p>ONA also obtained water temperature data from 2021 to 2022 from the Water Survey of Canada and installed water temperature data loggers in the West Kettle, Kettle, and Granby Rivers. Further data analysis and literature review are planned, but are not yet available.</p> <p>Regional District of Kootenay Boundary (RDKB) completed a drought management plan for the Kettle River watershed (RDKB 2020). Surface water level stations and 3 groundwater observation wells are monitored by the federal and British Columbia (BC) governments in the Boundary region, which may be used to inform surface-groundwater coupling analysis. The assessment of water use included the breakdown of water licenses held within the Kettle River watershed, which were ~77% agricultural use, ~12% domestic use, and ~11% commercial use.</p> <p>The Granby Wilderness Society completed a riparian threat assessment in the Kettle River Watershed (Coleshill and Watt 2017), which assessed historical and current aerial photos, land use, riparian health and vegetation structure, and evaluated patterns of riparian health and landscape disturbance. Results included:</p> <ul style="list-style-type: none"> • range and forestry were dominant land uses, with natural and human-influenced disturbances including Mountain Pine Beetle and forest fires • resource roads made up 3.4% of riparian areas, amplifying disturbances related to sedimentation and habitat fragmentation • urban development areas were less prevalent than other land uses but had the poorest riparian health scores, while remote, high elevation sites had the highest riparian health scores 	<p>and Climate Change Strategy (BC ENV)</p>

#	Broad strategy	Descriptions and results	Participants ³
		<ul style="list-style-type: none"> increased human use was associated with decreased riparian health, leading to increases in water temperature, sediment and pollution inputs <p>BC Parks developed the Kettle River Recreation Area Management Plan in 2021 to provide management direction within the protected area. The management plan identifies the Speckled Dace as one of the species at risk supported by the Kettle River Watershed (BC Parks 2021).</p>	
3	Study the relationship between discharge and Speckled Dace productivity to help replace assumptions with direct observations	<p>ONA's monitoring and habitat assessment project (refer to table 1: row 1) included the collection of habitat assessment data (flow, substrate, and water depth) at each Speckled Dace capture location. A discharge database with data from the Water Survey of Canada was created to assess long-term patterns of discharge in the Kettle River Watershed; specific locations include West Kettle, upper Kettle, lower Kettle, and Granby Rivers. Results include:</p> <ul style="list-style-type: none"> based on the number of days discharge was below the minimum recommendation, low flows occurred at all locations in 2017, 2021, and 2022 for all locations between 2013 and 2022, April to June did not have optimal discharge for Speckled Dace (specifically juveniles) January to March had the highest number of days per month of optimal discharge for Speckled Dace the days per month of optimal discharge between August and December had high interannual variation the proportion of days with optimal discharge did not appear to be declining over time, but 2022 was the first year in the last 10 years where 0 days were within the optimal discharge range between September and December <p>Full data analysis and literature review are planned, but are not yet available.</p>	ONA, DFO
4	Support local stewardship groups to advance Speckled Dace recovery	<p>ONA's monitoring and habitat assessment project (refer to table 1: row 1) includes an outreach component, but this work has not yet been initiated.</p> <p>ONA worked with the RDKB Watershed Planning Committee, City of Grand Forks, and local stewardship groups and governments to improve data sharing, communication, stewardship, and collaborative planning and management in the Kettle River Watershed.</p>	ONA, DFO

#	Broad strategy	Descriptions and results	Participants ³
		<p>ONA produced a discussion paper highlighting <i>Sylix</i> (Okanagan) insights and Traditional Ecological Knowledge that can be applied to watershed management plans, such as the Kettle River Watershed Management Plan (ONA 2020). ONA identified information gaps in the Kettle River Management Plan and provided recommendations. Next steps included prioritizing discussions between ONA and RDKB and focusing on overall shared goals and objectives with a cohesive systems-based approach.</p> <p>DFO developed public outreach signage for the Speckled Dace, describing species' biology as well as <i>Species at Risk Act</i> status and protections. The signs are planned for installation.</p> <p>The RDKB developed the Kettle River Watershed Management Plan in 2014 in collaboration with local and provincial governments, as well as multiple sectors and organizations within the Boundary region to identify issues, develop strategies and act upon issues relating to water quantity, water quality, and aquatic ecosystems within the Kettle River Watershed (RDKB 2014).</p>	
5	<p>Work towards preventing entry of aquatic invasive species into Speckled Dace range above Cascade Falls</p>	<p>Regional stewardship organizations such as Boundary Invasive Species Society (BISS) and Central Kootenay Invasive Species Society (CKISS) aim to mitigate the threat of aquatic invasive species (AIS) within the range of the Speckled Dace. These organizations work collaboratively with stakeholders and the government to raise awareness, maintain databases, and provide identification resources for AIS in the region that may threaten Speckled Dace recovery (for example, piscivorous fish).</p> <p>AIS prevention campaigns at the national and provincial level increased general public awareness of AIS in the region over the reporting period. The Don't Let it Loose campaign raises awareness of the ecological consequences of intentionally releasing plants and animals in Canadian lands and waters. The Clean, Drain, Dry campaign educated the public on the best methods to prevent the spread of AIS through aquatic recreation activities. The Invasive-Wise Tourism program promoted the adoption of best practices for tourism operators to prevent the spread of AIS in BC.</p>	<p>ISCBC, BISS, CKISS, DFO</p>

#	Broad strategy	Descriptions and results	Participants ³
6	Research diet of juveniles less than 18 mm	No actions were taken related to the research of juvenile diet during the reporting period.	N/A
7	Research importance of embeddedness and relate to threats that create embeddedness	ONA's monitoring and habitat assessment project (refer to table 1: row 1) included descriptions of substrate and disturbance indicators in habitat assessments. The Kettle River critical habitat area had a dominant substrate of cobble and secondary substrate of gravel and the Granby River critical habitat area had a dominant substrate of boulder and secondary substrate of cobble. Further analysis and literature review are planned, but are not yet available.	ONA, DFO
8	Research spawning, night-time, overwintering and migratory behaviour	<p>Golder Associates Ltd. completed a fish inventory and fish habitat assessment for the Speckled Dace critical habitat in the West Kettle River in 2019 (refer to table 1: row 1). Results included:</p> <ul style="list-style-type: none"> • evidence of Speckled Dace spawning (spawning colouration in adults and newly emerged fry) • 2 distinct cohorts of Speckled Dace observed (newly emerged fry and juveniles), suggesting there may be multiple spawning events in a season • evidence of spawning in multiple side channels in the West Kettle River critical habitat parcel <p>ONA's monitoring and habitat assessment project (refer to table 1: row 1), included index surveys at 16 sites throughout the West Kettle, Kettle, and Granby Rivers, as well as snorkel surveys in the Granby River critical habitat area. Results included:</p> <ul style="list-style-type: none"> • 18 Speckled Dace were implanted with a passive integrated transponder tag to assess migration and overwintering in future surveys • 81 juvenile Speckled Dace were detected at a Grand Forks site, which may indicate a possible spawning area • a spawning snorkel survey was completed in Granby River critical habitat area, but no Speckled Dace were observed 	Golder Associates Ltd., ONA, DFO, industry
9	Clarify impacts of rangeland operations, including nutrient loading	The Granby Wilderness Society completed a riparian threat assessment in the Kettle River Watershed (refer to table 1: row 2), which identified rangeland as a dominant land use in the watershed.	Granby Wilderness Society

3.2 Activities supporting the identification of critical habitat

Table 2 provides information on the implementation of the studies outlined in the schedule of studies to identify critical habitat found in the recovery strategy. Each study has been assigned 1 of 4 statuses:

- 1) completed: the study has been carried out and is concluded
- 2) in progress: the planned study is underway and has not concluded
- 3) not started: the study has been planned but has yet to start
- 4) cancelled: the planned study will not be started or completed

Table 2. Status and details of the implementation of the schedule of studies outlined in the recovery strategy for the Speckled Dace.

Study	Timeline	Status	Descriptions and results	Participants ⁴
Verify that the 3 selected river sections contain the required features and attributes, and adjust boundaries as required	2018 to 2019	in progress	Golder Associates Ltd. completed fish inventory and fish habitat assessments for the Speckled Dace within a 1.193 km long section of the 2.4 km critical habitat parcel in the West Kettle River in 2019 (refer to table 1: row 1; Golder Associates Ltd. 2019). Results included: <ul style="list-style-type: none"> • confirmation that alternating riffle- glide habitat are present within the critical habitat parcel with predominately cobble throughout riffle sections and a combination of fines, gravel, and cobble throughout glide sections • observed riparian vegetation as mixed, immature forest, with varying coverage of overhanging vegetation and undercut banks • confirmation that adult and juvenile Speckled Dace were present within the critical habitat throughout the summer • evidence that the Speckled Dace may spawn in the side channels of the critical habitat area (detection of spawning colouration in adults as well as newly emerged fry) and may have multiple spawning events in a season (presence of newly emerged fry and juveniles) 	Golder Associates Ltd., ONA, DFO, industry

⁴ Lead participant(s) listed in bold; other participants are listed alphabetically.

Study	Timeline	Status	Descriptions and results	Participants ⁴
			<p>Okanagan Nation Alliance (ONA) received funding for a 3-year project (2021 to 2024) through the Habitat Stewardship Program to conduct monitoring and habitat assessments at index sites, including within critical habitat areas to address threats to the Speckled Dace (refer to table 1: row 1; Smith and Heetebrij 2023). Results from 2021 include:</p> <ul style="list-style-type: none"> • the Kettle River critical habitat area is a low-gradient reach with a high percentage of glide habitat (71% of length), followed by riffle habitat (25% of length) • the Kettle River critical habitat area has a dominant substrate of cobble and secondary substrate of gravel • the Granby River critical habitat area is higher gradient than the Kettle River critical habitat area, and has a high percentage of riffle habitat (79% of length) followed by glide habitat (9% of length) • the Granby River critical habitat area has a dominant substrate of boulder and secondary substrate of cobble <p>ONA also completed Canadian Aquatic Biomonitoring Network (CABIN) assessments in each of the critical habitat areas. Results indicated that the preferred prey of Speckled Dace are present within all areas including larvae from orders Ephemeroptera (mayflies and dragonflies), Plecoptera (stoneflies), and Trichoptera (caddisflies), as well as the family <i>Chironomidae</i> (midges).</p> <p>DFO conducted pole seine surveys of Speckled Dace within a 1.432 km length of the West Kettle River critical habitat area in 2015 (refer to table 1: row 1; MacConnachie et al. 2023). Observed substrate included large boulder, embedded cobble, gravel and sand.</p>	
Test hypothesis that Speckled Dace undergo downstream	2019 to 2021	in progress	ONA's monitoring and habitat assessment project (refer to table 1: row 1) implanted 18 Speckled Dace with a passive	ONA

Study	Timeline	Status	Descriptions and results	Participants ⁴
migration in winter and may overwinter in locations removed from feeding and spawning areas			integrated transponder tag to assess migration and overwintering in future surveys.	
Establish index sampling sites in each of the 3 river sections identified as critical habitat	2020	in progress	ONA's monitoring and habitat assessment project (refer to table 1: row 1) included establishing 1 Speckled Dace index site within each of the critical habitat areas in the West Kettle, Kettle, and Granby Rivers. Speckled Dace were captured at the Kettle River and West Kettle River critical habitat areas.	ONA

3.3 Summary of progress towards recovery

3.3.1 Status of performance indicators

Table 3 provides a summary of the progress made toward meeting the performance indicators outlined in section 8 of the recovery strategy. Each indicator has been assigned 1 of 4 statuses:

- 1) not met: the performance indicator has not been met, and little to no progress has been made
- 2) partially met, underway: moderate to significant progress has been made toward meeting 1 or more elements of the performance indicator, and further work is ongoing or planned
- 3) met: the performance indicator has been met and no further action is required
- 4) met, ongoing: the performance indicator has been met, but efforts will continue as needed to achieve the objectives outlined in the species' recovery strategy

Table 3. Summary of progress made toward meeting the performance indicators outlined in the recovery strategy for the Speckled Dace.

Performance indicator	Status	Details
A sustained summer adult abundance greater than 7,000 individuals confirmed within each of the 3 river sections identified as critical habitat starting in 2015	not met	<p>Okanagan Nation Alliance (ONA) conducted Speckled Dace index sampling in 2021 at 16 sites, including the critical habitat areas in the West Kettle, Kettle, and Granby Rivers (refer to table 1: row 1; Smith and Heetebrij 2023). Updated population estimates for the Speckled Dace are not yet available.</p> <p>Golder Associates Ltd. completed a fish inventory and habitat assessment in the Speckled Dace critical habitat in the West Kettle River in 2019. Speckled Dace presence was confirmed throughout the summer, but no population estimates are available (refer to table 1: row 1; Golder Associates Ltd. 2019).</p> <p>Fisheries and Oceans Canada conducted pole seine surveys to determine the density and estimate total abundance of Speckled Dace within a 1.432 km length of the West Kettle River critical habitat area in 2015 (refer to table 1: row 1; MacConnachie et al. 2023). Results include:</p> <ul style="list-style-type: none"> • the average density of Speckled Dace was 6.27 per linear metre of river (standard error = 1.98) • the mean population estimate for the length of the surveyed area was 8,978 (ranging from 6,143 to 11,814) and the mean population estimate for

Performance indicator	Status	Details
		the 2.4 km length of critical habitat area in the West Kettle River was 15,048 (ranging from 10,296 to 19,800) <ul style="list-style-type: none"> based on mean fork length and adult/juvenile size differentiation, 1,014 adults were estimated within the survey area, with an estimated average of 708 adults/km
Continued presence of adult Speckled Dace in summer confirmed in appropriate sites outside the 3 river sections identified as critical habitat starting in 2015	partially met	ONA conducted Speckled Dace index sampling in 2021 at 16 sites, including 13 outside of the 3 river sections identified as critical habitat, with at least 1 site in each river upstream of the known distribution (refer to table 1: row 1; Smith and Heetebrij 2023). Adult and juvenile Speckled Dace were captured at 11 of the 13 sites outside of critical habitat.

3.3.2 Completion of action plan

The “Action Plan for the Speckled Dace (*Rhinichthys osculus*) in Canada” was published in 2020 (DFO 2020). It is a comprehensive document that outlines the measures that provide the best chance of meeting the recovery goals and recovery objectives for the species, including the measures to be taken to address threats and monitor the recovery of the species.

3.3.3 Critical habitat identification and protection

For the Speckled Dace, critical habitat was identified to the extent possible, using the best available information, in section 7 of the recovery strategy (DFO 2018). Protection of the Speckled Dace’s critical habitat from destruction was accomplished in 2018 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 ([SOR/2018-218](#)).

The recovery strategy contains a schedule of studies outlining the research required to identify additional critical habitat if necessary, and to acquire more detail about the critical habitat identified, in order to achieve the species’ population and distribution objectives. Completion of these studies is a priority to identify and/or refine additional critical habitat necessary to support the species’ population and distribution objective and protect the critical habitat from destruction.

3.3.4 Recovery feasibility

Based on the best available information, the recovery of the Speckled Dace was determined to be feasible (DFO 2018). No new information has been gathered that would suggest the Speckled Dace no longer meets the feasibility criteria laid out in the recovery strategy. The studies and initiatives outlined in sections 3.1 and 3.2 of this progress report demonstrate progress towards better understanding this species and its recovery potential.

4 Concluding statement

Over the reporting period (2018 to 2022), through the implementation of the activities identified in the “Recovery Strategy for the Speckled Dace (*Rhinichthys osculus*) in Canada”, some progress has been made in recovering the Speckled Dace, including:

- surveys, inventories, and monitoring of the Speckled Dace to assess presence and abundance, as well as collection of spawning, migratory and seasonal behaviour data
- fish habitat assessment in the Kettle River Watershed, including within the Speckled Dace critical habitat areas in the Kettle and Granby Rivers
- riparian threat assessment in the Kettle River Watershed
- the development of multiple management plans for the Kettle River Watershed, which consider the needs of and/or address threats to local species at risk, including the Speckled Dace
- stewardship and outreach to increase public awareness and mitigate the threat of aquatic invasive species that may threaten the recovery of Speckled Dace
- legal protection of the Speckled Dace’s critical habitat through a SARA critical habitat order in 2018
- publication of the “Action Plan for the Speckled Dace (*Rhinichthys osculus*) in Canada” in 2020

While progress has been made towards addressing the activities identified in the recovery strategy, the performance indicators have been either not met or partially met, and the success at meeting the population and distribution objective is unknown. The status of the species is believed to be stable based on the continued detection of the Speckled Dace in monitoring programs, though definitive population abundance and trend data are lacking. Further work is required to support the survival and recovery of the Speckled Dace. Priority next steps may include, but are not limited to:

- continued consideration of the recovery needs of the Speckled Dace into land and water use plans
- addressing knowledge gaps that inhibit recovery of the species
- long-term monitoring and data analysis to determine presence and population abundance of the Speckled Dace and to evaluate fish habitat quality
- continued stewardship and public outreach to mitigate the threat of aquatic invasive species on Speckled Dace
- completion of the schedule of studies identified in the recovery strategy to determine if modification of the critical habitat identification is necessary

DFO remains committed to recovering the Speckled Dace. The work started and completed to date has built a strong foundation for continued research and management of this species over the next reporting period. Progress made to date would not have been achieved without the contribution of partners including the Okanagan Nation Alliance, British Columbia Ministry of Environment and Climate Change Strategy, the Invasive Species Council of British Columbia, Boundary Invasive Species Society, Central Kootenay Invasive Species Society, the Regional District of Kootenay Boundary, and Granby Wilderness Society. DFO looks forward to continued collaboration and welcomes the participation of additional partners.

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