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Opportunities and limitations of Canada's Species at Risk Act for protecting Pacific salmonids: lessons learned from the case of the Thompson River steelhead

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Abstract

Imperilled species legislation is a critical tool at various levels of government for biodiversity conservation. In this article, we examine the opportunities and limitations of Canada's Species at Risk Act (SARA) to protect a highly threatened population of Pacific salmonid in British Columbia—the Thompson River steelhead (*Oncorhynchus mykiss*). To date, no Pacific salmonids have been listed under Canada's SARA despite critical population declines. The case of Thompson River steelhead is relevant because this species is often viewed as the "canary in the coal mine" for other Canadian Pacific salmonids and recently went through the Canadian listing process for imperilled native species. Thompson River steelhead, which is a culturally and socio-economically valuable migratory salmonid species, was deemed to be "endangered" by the Committee on the Status of Wildlife in Canada (COSEWIC) following an emergency assessment completed in February of 2018. The assessment noted population declines of 79% over the last three generations, yet Thompson River steelhead were ultimately not listed under Canada's SARA. Our analysis of this case is based on semi-structured interviews with individuals involved with, or knowledgeable about, the COSEWIC and SARA listing process for Thompson River steelhead ($N = 17$). Findings from these interviews point to several structural and institutional reasons why this species was not listed despite its precarious status: (1) spillover effects from listing species under SARA, (2) time required to complete listing processes, (3) reactive rather than proactive emergency listing processes, (4) listing decisions based on socioeconomic considerations rather than conservation science, and (5) lack of transparency in listing processes. Interview participants suggested several solutions to overcome these limitations, including (1) allowing for the management of co-migratory stocks following SARA listings, (2) expediting listing timelines, (3) making listing processes more pro-active, and (4) ensuring transparent, science-based decision-making. Our analysis demonstrates the potential of SARA listings to protect aquatic species and suggests paths forward to improving the effectiveness of Canada's SARA.

Key words: Species at Risk Act, pacific salmonids, fisheries management, imperilled species

Introduction

As climate change and other anthropogenic factors threaten biodiversity at an alarming scale (Sala et al. 2000; IPCC 2021), governments around the world have taken action to implement legislation and strategies to protect native species (Lindgren 2001; Rodrigues et al. 2006; Xu et al. 2021; Hermoso et al. 2022). One common method of managing imperilled species is through government-determined imperilled species inventories, which list species according to their conservation status and extinction or extirpation risk. Such listings happen at the international, national, and provincial/state levels. For example, the IUCN Red List of Endangered Species lists species at the international level to provide comprehensive information on the global status of species (but it is non-legislative), Canada's Species at Risk Act (SARA; SARA 2002) and the US Endangered Species Act (US ESA; U.S. Congress U.S. 1973) list species at the national level, and some provincial governments in Canada have provincial-level legislation (e.g., the Endangered Species Act of Ontario (Government of Ontario 2007); the Wildlife Act of British Columbia (https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/species-ecosystems-at-risk/legislation).

These lists are valuable conservation tools as they can provide imperilled species with visibility, legal protections, and mandated recovery plans (Rodrigues et al. 2006). Furthermore, government involvement has been shown to be the greatest predictor of increased conservation efforts and investments (Baynham-Herd et al. 2018). However, listing imperilled species as a conservation strategy has its shortcomings (see Bachman et al. 2019). Resources for listing are finite, decisions to list are often reactive and not conducted in

a timely manner, and enforcement and monitoring following listing is often weak or non-existent (Beatley 2000; Schwartz 2008; Bachman et al. 2019; Buxton et al. 2020). Furthermore, listing processes may consider economic costs when making decisions, and give preference to species that have no economic value or do not conflict with other government priorities (Bachman et al. 2019; Mandrak 2025). For example, Shultze et al. (2013) found that listing fish under Canada's Species at Risk Act (SARA) is determined more by the costs associated with protection than by the conservation status of the candidate species.

Imperilled species legislation in Canada

Canada's commitment to the United Nations Convention on Biological Diversity in 1992 prompted it to develop imperilled species protection instruments, first the Accord for the Protection of Species at Risk in 1996, followed by Canada's SARA in 2002. SARA extends legal protection to wildlife native to Canada (species, sub-species, and distinct populations), with the aim of preventing extirpation/extinction and to ensure actions necessary for recovery (Government of Canada 2014). SARA has jurisdiction on federal land, most freshwater, and oceans (Irvine et al. 2005) and covers all listed at risk (imperilled) species, as well as their critical habitat (Government of Canada 2019). Since its enactment, Canada's SARA has been criticized, especially when it comes to the handling of Canadian fish species (see Mandrak 2025, for overview). Canadian fish species were found less likely than any other taxa to be listed (Dorey and Walker 2018; Creighton and Bennett 2019). In addition, fish are less likely to be listed if harvest (commercial or subsistence) is identified as a threat to their survival, if Fisheries and Oceans Canada (colloquially known as DFO after its former name, the Department of Fisheries and Oceans) is the responsible authority, if located mostly or entirely in Canada, or if they are a more northern species (Findlay et al. 2009; Mandrak 2025).

Steps to listing imperilled fish under Canada's SARA

Listing species under Canada's SARA involves a complex, multi-step process. First, species are identified and assessed by the arms-length Committee on the Status of Endangered Wildlife in Canada, or COSEWIC (COSEWIC 2019). Voting members of COSEWIC are comprised of 13 representatives from each of the 13 provincial and territorial government wildlife agencies, four representatives from the four federal wildlife agencies, three non-government scientists, 10 co-chairs that manage species specialist subcommittees, and a co-chair for the Indigenous Traditional Knowledge subcommittee. Species Specialist and Indigenous Traditional Knowledge sub-committees are comprised of two co-chairs and at minimum five other knowledgeable members (selected from universities, wildlife agencies, museums, etc.), and are tasked with identifying at risk candidates requiring status assessments. From the information generated by sub-committees, COSEWIC builds a ranked candidate list. Once candidates for assessment are determined, COSEWIC status reports are commissioned and completed by bidding contractors, typically environmental consulting firms. The report writers use existing available information and the report is reviewed by relevant jurisdictions. Once completed, reports are sent back to the relevant sub-committees and other COSEWIC personnel for peer-review (COSEWIC 2019). The status of a candidate having gone through an assessment is determined based on the final assessment report.

Decisions on status are based on biological risk and use listing criteria from the International Union for Conservation of Nature (IUCN; Irvine et al. 2005). In the case of emergencies, COSEWIC can expedite the process by conducting an emergency assessment, which is completed more quickly than the normal period of 2–4 years. Emergencies are determined by COSEWIC as a situation in which a candidate for assessment is in "extreme" risk of extirpation or extinction (the example for this scenario given by COSEWIC is if a candidate has experienced population declines of more than 50% within 10 years; COSEWIC 2015). Calls for an emergency assessment can come from individuals or organizations outside of COSEWIC and are assessed by the COSEWIC chair and other relevant sub-committees and COSEWIC personnel. Decisions to engage in an emergency assessment are made by vote by the COSEWIC Emergency Assessment Subcommittee members. Once completed, COSEWIC assessment and emergency assessment reports, including designated status are published on the SARA public registry. More detailed information on COSEWIC processes can be found at www.COSEWIC.ca.

The Minister of Environment and Climate Change is tasked with forwarding COSEWIC reports along with a recommendation to list or not list the candidate species to the Governor in Council, which acts on behalf of the Federal Cabinet and makes listing decisions (SARA 2002). The Federal Cabinet is made up of all government ministers and the Prime Minister. Prior to forwarding their recommendation to the Governor in Council, the Minister of Environment and Climate Change is required to gather information on the socio-economic costs and benefits of listing in a process that includes consultations with stakeholders. In the case of fish, the Minister of Fisheries and Oceans Canada (DFO) advises the Minister of Environment and Climate Change regarding their recommendation to list or not list (Mandrak 2025). Once the Federal Cabinet receives the recommendation from the Minister of Environment and Climate Change, it has 90 days to decide whether to list or not list the candidate under the SARA. If no decision is made in that timeframe, the COSEWIC recommendation to list or not list is used by default (Irvine 2005).

Once listed under SARA, the designated species or population receives federal legal protection, making it illegal to harm or disturb an individual from the listed population(s), nor to harm or damage critical habitat that is federally controlled (Irvine 2005). Listing also initiates a series of ancillary obligations on the federal government, including the formulation of a species or population recovery plan within one year of listing that must be evaluated every 5 years until the species/population has recovered (https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies.html).

Since the enactment of SARA, the federal government has repeatedly been subject to lawsuits from conservation organizations for failure to adhere to these obligations (McDevitt-Irwin et al. 2015).

The case of the Thompson River steelhead

Thompson River steelhead are an anadromous fish native to the Pacific Coast of Canada, including the province of British Columbia (BC). Steelhead attract anglers from around the world, thus playing a significant role in BC's recreational fishing industry and resulting economic activity (FFSBC 2020). Unfortunately, the population of Thompson River steelhead is in severe decline. As of February 2018, Thompson River steelhead exhibited a 79% decrease in population over the past three generations (COSEWIC 2018). These declines have affected the wellbeing of people who relied on this population, and has had an impact on local economies in rural BC (Jeanson et al. 2025).

In response to requests from angler associations (Jeanson et al. 2025), the chair of COSEWIC told the Minister of Environment in December 2018 that an emergency COSEWIC assessment would be completed on Thompson River steelhead. The emergency assessment was released in February 2018 and determined that Thompson River steelhead were endangered, recommending an emergency listing under SARA. Ultimately, in July 2019, the Government of Canada decided not to list Thompson River steelhead. In their Explanatory Note (mandated by law), the federal government stated that they believed the "most effective approach" to managing Thompson River steelhead is to "continue to influence human activities using existing legislative tools, and complementary measures" (Government of Canada 2019). The government committed to using "a combination of other legislative mechanisms available under the Fisheries Act and work collaboratively with the Province of British Columbia" to protect the population. Furthermore, in collaboration with the province and Indigenous groups, the federal government committed to establishing a steelhead conservation plan. Although action was promised, the failure of the federal government to list Thomson River steelhead under SARA means that the federal government has no legal obligation to protect the population or table a recovery plan (albeit the Fisheries Act contains provisions for protecting fish and fish habitat from harm). In short, it is only the federal government that can enact meaningful policy (i.e., SARA listing) for imperiled fish species that trigger legal protections and associated restoration plans and actions that follow.

The Thompson River steelhead case study provides the opportunity to understand the opportunities and limitations of Canada's SARA processes. Using the views of highly informed interview participants, this work includes an analysis on limitations of current processes as well as highlights possible solutions to overcoming them. By using narrations from those with extensive firsthand knowledge, this research is uniquely positioned to inform future decision-making in this space and allow for the better management of other aquatic species at risk in Canada.

Methods

The research reported in this article is part of a PhD dissertation completed by the first author (Jeanson 2021). Research for the dissertation began in 2018 and was completed in 2021 following interruptions from the COVID-19 pandemic. The analysis presented here is based on semi-structured interviews with 17 people involved with, or presumed to be knowledgeable about, the emergency COSEWIC assessment and SARA listing process on Thompson River steelhead in BC. Of those interviewed, 11 were fisheries biologists at the provincial and federal level, 4 worked for fisheries non-government organizations (NGOs), one was a fisheries consultant, and one worked in recreational fisheries marketing. Potential interview participants were initially identified using public information about participants in the COSEWIC emergency listing assessment. A further round of recruitment was conducted using snowball sampling based on recommendations from initial participants. All participants were initially contacted by email. We did not explicitly ask participants to characterize their familiarity with this topic as part of the interview itself but we did have informal interactions with potential applicants when creating the pool of potential participants and did some initial screening if individuals suggested they were not the "right person" to participate. We acknowledge that not all participants may have been familiar with all aspects of the listing process which may have influenced our results. Nonetheless, given out focus on key informants it is our belief that most individuals we interviewed were well versed in these processes. All interviews were conducted in accordance with the University of Ottawa Research Ethics Board (File Number: 02-18-08). It is important to acknowledge that this study did not involve interviews with Indigenous elders, knowledge keepers, community members, or government representatives. As such, the perspectives provided here represent a settler perspective. Future work should be done to consider how Indigenous knowledge systems and ways of knowing can be used to improve these processes intended to protect at-risk species in Canada.

Interviews were comprised of open-ended questions on steelhead declines in the interior Fraser, solutions to steelhead declines, COSEWIC assessments (processes and specifics on the Thompson River steelhead case), and SARA listings (processes and specifics on the Thompson River steelhead case; please see Supplemental Material File A for a complete list of interview questions). Interviews were conducted over telephone during the summer months (June–August) of 2019 and audio recorded. Interviews were saved under code names if respondents asked for anonymity.

Transcripts were generated directly from recordings using Trint transcription software. The resulting transcripts were then reviewed and edited by a research assistant to correct any errors. Coding was conducted manually using the NVIVO 12 software using the codebook approach developed by Eckert et al. (2020). Specifically, themes were identified through the review of transcripts and recorded a codebook. Transcripts were then reviewed a second time in direct reference to the codebook, during which it is noted whether each theme is supported or unsupported by each respondent. This

approach generates quantitative data regarding the degree of support or opposition to a theme that exists across all interviews. Coding also identified key quotations that explain or elaborate particular events or perspectives.

Results

Limitations to Canada's imperilled species listing processes

Our findings suggest that current SARA processes have serious deficiencies for protecting aquatic species in Canada. Of respondents interviewed, none stated that current procedures for listing endangered fish populations in Canada are working well (14 of 17 participants said they do not work well, 2 were unsure, and 1 did not speak on this topic). Participants' general pessimism was grounded in several factors: (1) spillover effect from listing under SARA, (2) time required to complete listing processes, (3) reactive rather than proactive emergency listing process, (4) listing decisions based on socioeconomics rather than conservation science, and (5) lack in transparency in listing process. We consider each in turn.

Spillover effects from listing species under SARA

Of those interviewed, 10% shared (unprompted) the perception that the outcomes of a SARA listing are too restrictive to favour decisions to list aquatic species. For example, respondent #7 stated "the SARA process […] is not well designed for dealing with fish. It is a process [an Act] that really was designed around terrestrial animals […]. It's simply too blunt an instrument [for fish]," and respondent #13 shared "our SARA is just too restrictive at the moment to allow for listing [of steelhead]." Participants stressed that Pacific salmonids occupy large biodiverse habitats where commercial, recreational, and First Nations fishing takes place. It is thought that a SARA listing would legally protect listed Pacific salmonids and their habitat from all harm would curtail all fishing activities in these vast regions. As respondent #15 explained, "you cannot kill, harm, or harass, or basically touch that fish if [that fish] were listed under SARA, and so that makes the management actions for fishing activities quite restricted." In a similar vein, respondent #16 stated "SARA is often perceived not just by the federal government but by public figures as a very blunt tool that doesn't allow for collaborative management and adaptive management [of fisheries]." To summarise, given Canada's listing processes were not designed with fish in mind, the nature of the repercussions to listing Pacific salmonids is thought to limit the ability for fisheries management to develop socio-ecological solutions to socio-economically valuable fish species conservation in Canada.

Time required to complete listing processes

Of those interviewed, 9 of 17 (without prompt) suggested that COSEWIC assessments are too lengthy and 10 of 17 (without prompt) stated that SARA listing decisions take too long under current timelines. Respondents #8 and #11 respectively said "It takes too long to get to a listing decision. It's three to five years now.," and "getting species into a SARA list takes too long […]." Respondents made it clear that a quicker listing procedure is needed in many cases yet stressed the importance of not forgoing the collection of necessary data and evidence for listing decision-making. For example, respondents stated that the expedited process taken for Thompson River steelhead was less than ideal due to shortcuts made to meet deadlines. As explained by respondent #16, "emergency assessment timelines for completing all that work are much shorter, much more abbreviated. The opportunity to do those appropriate consultations is limited. The opportunity to really understand the biology or get a snapshot of the biology and population of the species is also shortened. There are limitations." To summarise, long timelines are a limitation to the listing process yet should not be corrected at the expense of the relevant collection of evidence and information for decision-making.

Reactive rather than proactive emergency listing process

Emergency COSEWIC assessments like the one conducted on Thompson River steelhead were referred to as "quite reactionary to information, from anybody, government, First Nations, and the like" (respondent #8). Respondent #9 explains "it's actually driven by the populace, by people who write letters and other organizations, NGOs who put information forward and pressure governments [.].," and respondent #7 shared "[it's] the people who pushed for the emergency listing. I mean, this was not a democratic process." This was flagged as concerning to some, as imperilled species/populations that are less charismatic or socially valuable may be overlooked for emergency assessments under current processes in favour of others that are of more interest to stakeholders. Respondent #1 said "[…] the fact that interior Fraser steelhead have special treatment over a number of other Pacific salmonids that are of equally concerning conservation status is indicative of where they take that direction."

As they are reactive, emergency listing processes begin when situations are already dire, thus also limiting the potential benefits to listing. As respondent #9 shared, "if it would have happened 10 years ago (listing process for Thompson River steelhead) that would have made a difference. It's hard to say now, if it's so late in the game how much we would be able to actually do to save these fish." This being noted, it was suggested that it is important for communities to have the ability to initiate listing actions. For example, respondent #6 stated "I think that is a very important piece to have public be able to comment and drive that [emergency COSEWIC assessment] process." To summarise, emergency COSEWIC assessments that kick off emergency listing processes in Canada are only conducted on an emergency basis, which suggests species of social and economic importance are favoured. Although COSEWIC is nominally unbiased in its taxonomic focus, it is not immune to taxonomic biases that have been recognized for a long time (e.g., Di Marco et al. 2017). Furthermore, emergency listing processes are often enacted when

situations are already dire, limiting the potential benefits that come with a listing under SARA.

Listing decisions based on socioeconomics rather than conservation science

The importance granted to socioeconomic factors during listing decision-making over findings from conservation science was flagged as a significant inhibitor to SARA listing. Of respondents interviewed, 16 of 17 participants mentioned (without prompts) "special consideration for socio-economic factors" as a major limitation to listing Pacific salmonids under SARA over scientific findings regarding the status of the species (1 participant did not mention this limitation to listing). Respondent #1 stated that "the economic impacts of listing an anadromous fish species are too great. The government does not want to list these fish." and respondent #10 stated "If you look at historically what has been listed, I think the track record shows for itself that there is an unwillingness to use science to list any species of salmon or fish species that has any kind of social or economic impact." Respondents clarified it is specifically short-term socio-economic benefits that are overshadowing scientific recommendations to list, and not the long-term economic and social benefits that come from conservation of the species in question. As respondent #13 said, "most governments are happy with not listing because of short-term socioeconomics. If [government] looked in terms of long-term socioeconomics, I don't think we would be talking. [The government] would be making different decisions […] and would be crafting a long-term strategy to sustain activities into the future." Short term socioeconomic gains are said to be favoured due to political considerations. As respondent #11 explained, "you [i.e., the government] rely on keeping people happy so you get elected next year. That doesn't work. You're ignoring science […]." To summarise, scientific findings favouring listing are overshadowed by short-term socioeconomic benefits to not listing Pacific salmonids.

A lack in transparency of considerations in SARA listing decisions

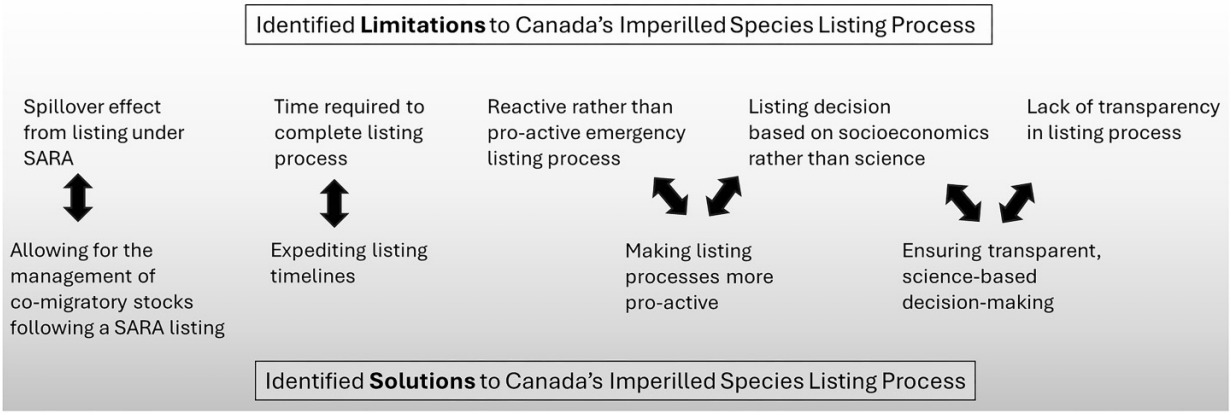
Although COSEWIC assessments are conducted to inform listing decisions by the government, only 4 of respondents thought that the COSEWIC assessment done on Thompson River steelhead played a role in the decision to not list BC steelhead populations under SARA (9% stated the opposite, 1 was unsure, and 2 did not speak on this subject). As respondent #13 explained, "the process has the potential to break down a little bit from when COSEWIC reports their findings, to when the minister makes his decision [to list or not list]." Respondents shared a concern that the weight given to different types of evidence is not well shared or explained, making it easier to base listing decisions on political agendas rather than evidence. For example, respondents #15 and #16, respectively, stated: "the part that I don't know about is how different factors are weighed in the decisions [to list under SARA], so there could be more transparency on that ahead of time.," and "I have no idea, nor the privilege to know what exactly was considered by [federal] Cabinet. All we know is what we send them […] and we have to hope that all of that information is considered, but we don't know."

Some respondents shared that this lack of transparency has allowed for Fisheries and Oceans Canada (DFO) to have too much influence over decision-making. As explained by respondent #17: "If you look at marine fish there's hardly any that are listed following COSEWIC reports and that's because DFO is of the opinion that they can manage fish more effectively outside the SARA. They convince the Ministers to that effect, and they don't get listed." In the case of Thompson River steelhead, several participants suggested that DFO was looking at its own internal data and research rather than the independent assessment from COSEWIC. Respondent #8 shared their perception as follows: "I don't think they [the Governor in Council] looked at the COSEWIC assessment at all. […] DFO produces its own advice for its own decisions. It doesn't rely on externally produced advice. […] They [three independent authors] submitted it [the steelhead recovery potential assessment review] to DFO [to write up] the science advice report which is an abbreviated version of the outcomes of the review (it is meant as quickly produced information that's for the ministers). The submitted draft and the one that DFO posted had, we thought, significant changes to the conclusions. […] We pushed back, and they said sorry, it's our process and we're allowed to do it our way." Respondent #13 also alluded to this event, "there's a science-based document for which there's a title and there's people that put their names on the document and put their professional reputations at stake on its' contents. That's not released yet. Yet a modified interpretation of that advice is released under no authorship […]." To summarise, a lack of knowledge regarding the weight of considerations during listing decision-making potentially allows for decisions to be based off internal sources (which may or may not include formal DFO science advice processes that in some cases include external peer reviewers; Mandrak 2025) and ultimately limits the credibility of Canada's SARA when it comes to listing Pacific salmonids and other fishes.

Suggestions for improving Canada's listing processes for imperilled species

Respondents asserted that government has the capacity to protect Pacific salmonids, as 15 of 17 respondents agreed that the federal government can aid in the restoration of Pacific salmonids (2 of 17 respondents asserted the opposite), and 14 agreed that the provincial government can do the same (3 stated the opposite). When specifically asking about Thompson River steelhead, all but one of the respondents indicated more action is needed at the federal level to save steelhead (1 was unsure), and 13 of the 17 respondents reported more action is needed at the provincial level to save steelhead (2 reported the opposite, and 2 were unsure). Respondents provided insight on improvements that could be made to current listing processes to better account for and protect imperilled Pacific salmonids in Canada (see Fig. 1). Respondents suggested the following changes: (1) allow sustainable fisheries management of co-migratory abundant fisheries, (2) reduce listing timelines, (3) make the listing process more

Fig. 1. Identified limitations and solutions to Canada's imperilled species listing processes. Source: the authors.



pro-active and forward-looking, and (4) ensure transparent, science-based decision-making.

Allowing for the management of co-migratory stocks following SARA listings

Many respondents took the position that a SARA listing should not impede the ability for fisheries management to develop novel, sustainable, and adaptive management strategies for co-migrating abundant fish populations. An unprompted 11 of 17 respondents suggested that selective fishing measures and/or other innovative fishing strategies that do not harm steelhead (and allow for co-migratory fisheries to continue to function) are the way forward. Several respondents voiced that it was this exact factor that makes a SARA listing inappropriate for Pacific salmonids. For example, respondent #2 stated "I think the primary reason [Pacific salmonids are not listed under SARA] is likely the impact it would have on fishing sectors. They would have to curtail their fishing to minimize encounters with the listed populations. And it's a really unfortunate reasoning because it follows a false binary that we can't actually harvest abundant populations without harming endangered ones.," and respondent #13 said "The problem is not "don't fish." It's how you fish and where you fish and when you fish. If you're listed under SARA the case is that you just can't do nothing."

This being noted, Canada's SARA may be more favourable to sustainable fishing practices such as selective fishing than previously believed. Respondent #2 stated "I've definitely heard that perception [that SARA listing implications do not allow for adaptive, sustainable fisheries management], but I've also heard from legal experts that there are provisions within the law that would allow for innovations that would minimize mortality and still allow fishing to occur for co-migrating abundant stocks. I don't know if there is a change needed of if it's just that there's some clarification required as to what is possible under the current law." Whether it be changes to the current law, or a clarification to what is allowed regarding co-migratory fisheries, clearly defining the implications of SARA on fishing practices may be an avenue forward. Respondent #2 shared "In my opinion the SARA listing would have really forced the fishing industry or all fishing sectors to really get creative about catching chum salmon and other target species with little or no impact on steelhead. It would have been the incentive that we need to make that happen. And without that bringing the hammer down in the form of the SARA listing there's just not the incentive to shift to more stock selective fishing methods and equipment."

Reduce listing timelines

Increasing COSEWIC's capacity to assess imperilled species was suggested to reduce timelines. Respondent #17 stated "we [COSEWIC] are limited in our resources, both human and money, because there's a lot of species out there that are being assessed.," and respondent# 15 stated that "they [COSEWIC] only look at so many species [at] each of their biannual meetings. Maybe we need more meetings. Maybe more funding to pass for COSEWIC to assess species because there's a lot to look at." There may also be room to increase efficiency within COSEWIC to allow for more resources to be put towards new assessments. Respondent #17 shared that COSEWIC may be able to increase their capacity to take on assessments by increasing efficiencies in how they navigate re-assessments for species that have not faced any environmental changes. "We're looking at ways of prioritizing thorough real big assessments and reassessments […] we need a process to say, here's a report, nothing has changed, we're not writing a full report, read the old report, it's the same."

Similar sentiments around increasing efficiency and increasing capacity were shared around the SARA listing decision-making process. Respondent #14 suggested: "In terms of being speedy […], you basically have to have the resources to do that. We're talking about more bodies." Increasing efficiencies around generating DFO documents and reports used for listing decision-making were also suggested. For example, respondent #15 said "when [a species/population] has been assessed by COSEWIC or is on their priority assessment list, [we should be] looking for efficiencies between the COSEWIC status assessment and the [DFO reports]." Respondents #8 and #17, respectively, suggested "reduce[ing] timelines to listing decisions and adher-

ence to other timelines in the legislation (regarding recovery planning).," because currently "everything should be in Cabinet's hands within two years, except in the case of some high-profile species like here [Thompson River steelhead]. […] government could still change that without much ado." To summarize, changes are needed to COSEWIC assessment protocols and SARA listing decision-making processes to allow for more efficiency and an increase in resources so that timelines can be shortened.

Make the listing process more proactive and forward-looking

Respondents expressed the view that SARA listing decisions should be more forward-looking and should favour long-term over short-term benefits for advancing political agendas. As voiced by respondent #9, "governments are going to look at a situation and say, how is this going to benefit us being re-elected? Where are the best benefits going to come from this decision? What we have is a system that is basing itself on politicians being re-elected and not saving fish." Not only do listing decisions need to be forward-looking, resulting recovery plans must also consider longer timelines. As explained by respondent #13, "it [conserving Pacific salmonids] requires a longer-term plan than what the political system might afford. It might be a 10- or 20-year plan, not a five year one to make such a transition. You need to establish a system that can transcend the political cycle, like a commission with a clear goal for transformation." Overall, 7 of 17 respondents agreed that considerations for listing under SARA change when a new political party takes office (5 indicated this was not the case, 3 were unsure, and 2 did not speak on the matter).

Additionally, respondents voiced the importance of having a proactive listing process, thus ensuring that when considered for listing, the candidate for listing is not already in a dire, unrecoverable situation. Respondent #4 suggested that "the loss for our future generations like a population getting extirpated from the Thompson River or the Chilcotin river takes a lot of effort to try to bring back. It's best to use monitoring up front and take action [earlier]." To summarise, SARA listing decisions in Canada need to transcend political agendas and election timelines and should be a proactive rather than reactionary process to ensure that when considered for listing, candidates for listing are not already facing extirpation.

Ensure transparent, science-based decision-making

To favour decision-making backed by scientific findings rather than politics, respondents suggested giving more weight to scientific findings and recommendations resulting from the COSEWIC assessments. Respondents also suggest improvements be made to collection methods used for socio-economic assessments. As expressed by respondents #9 and #13, respectively, "it shouldn't be up to an elected government when you have the COSEWIC saying this is of immediate concern. I think that should be enough to create action.," and "It shouldn't go to a politician who is affected by populism, and not by science. […] When we take the time and energy to develop systems like the COSEWIC system, we need to follow those recommendations to make them work. There's no sense in going through this energy and spending this money and endeavoring to do this to ignore it. That's idiocy and that's the path we've chosen." For the listing processes to be applicable to Pacific salmonids, the weight of management priorities and short-term socioeconomics needs to be less important than scientific recommendations for listing. As stated by respondent #13 "the option is the provision of scientific information [to cabinet for listing decision-making] could be improved. The science advice should be provided as the COSEWIC group does it with some greater degree of independence and less dependency on management." Decisions should be made transparent, thus forcing government to explain and defend listing decisions (potentially leading to a more evidence-based listing approach). As stated by respondent #2, "there should be less discretion for politicians to weasel out of listing populations under SARA."

Furthermore, although COSEWIC and SARA processes do engage with stakeholders and conduct socio-economic assessments about the impacts of listing imperilled species, respondents voiced that more collaboration than what is currently being done is necessary for imperilled fish species. Respondent #1 shared that we can improve evidence synthesis for decision-making processes by "making sure that fisheries and forestry and mines and all these land and development [organizations] come together and start to look at things in a broader sense of how we as a society impact these fish, making sure that these activities take into account the important habitat that they could be impacting." Similarly, respondent #16 stated that "collaboration with various governments […] [and with] First Nations organizations absolutely because they are by far the best […] experts that we have in BC in the very localized area that would have some understanding of the changes in the environment. I think that would be absolutely key." To summarise, respondents suggested listing decisions be made directly from reports generated outside of the governing body (i.e., COSEWIC assessments) and with more collaboration with Indigenous rightsholders and stakeholders. Also, the federal government should share the weight of what findings and documents were considered following their decision to list or not list.

Discussion

Imperilled species listing practices in place in Canada have received criticism since their establishment in 2002 (Findlay et al. 2009; Bachman et al. 2019; Mandrak 2025). That said, Canada's SARA is a valuable tool to legally protect imperilled species (Turcotte et al. 2021), meaning efforts made to improve current processes are worthwhile. Using Thompson River steelhead as our case study, our findings suggest current practices in place for listing Pacific salmonids under Canada's SARA are not effective (consistent with the criticisms levied by Mandrak (2025)). The implications of including Pacific salmonids under SARA do not favour listing due

to heavily weighed socio-economic factors. Furthermore, current listing processes are not transparent and are lengthy and reactive (Turcotte et al. 2020), often assessing candidates only when extirpation is imminent. For Canada's listing processes to benefit Pacific salmonids, listing processes must be more timely, quick, transparent, and allow for the management of sustainable co-migratory fish populations. Respondents indicated that these goals are possible within existing legislative frameworks with sufficient procedural and process reforms.

Indeed, our findings indicate that difficulties listing aquatic species using SARA are in large part political. Canada's DFO is put into a difficult position, as it oversees settler commercial and Indigenous fisheries and is heavily involved in SARA listing decision processes. Conflicting interests within DFO may be a strong factor as to why Pacific salmonids are not being listed, as it would explain DFO's motives for pushing towards non-listings (Jeanson et al. 2025). Respondents suggested more transparency regarding considerations taken during listing decisions, and more decisions to be based off independent scientific documents, yet it is hard to know if these changes would be enough to overcome political interests to not list socio-economically valuable fish.

Respondents were disappointed with the non-listing, as SARA is seen by many as the tool with the most impact for protecting species in Canada. For example, respondent #11 explained: "Right now, whatever emergency plan they think is going to fix things … there's no legal backing to it. If it's under SARA, there is legal ramifications. If something goes wrong, non-profits or local stakeholders can sue and say, look, you're not doing this. You must do it. It's listed under SARA." Although other tools are in place for protecting Pacific salmonids in Canada (e.g., Fisheries Act, Pacific Salmon Commission, etc.), none carry as much weight to influence change due to the lack of enforceable legal protection. This said, some respondents suggested other strategies and legislation should be looked at and utilized to protect Pacific salmonids. For example, the province of BC lacks imperilled species legislation at the provincial level (Gordon et al. 2024). Provincial politicians have suggested that creating a British Columbian act offers an opportunity to address limitations to the federal SARA process (The Narwhal 2024).

It is important to acknowledge that our study has limitations. Primarily, it did not include Indigenous perspectives, which must be a key consideration in decision-making, for species at risk in general but particularly for culturally important species such as steelhead (Hill et al. 2019; Eckert et al. 2020). Our hope is that our work will complement further exploration of Indigenous perspectives and knowledge, to undertake Thompson River steelhead conservation in a more harmonized approach. Such an analysis could determine whether delays are for legitimate reasons of including need to consider, weave, braid, and/or bridge Indigenous knowledge and fostering Indigenous partnerships, or if they are due to avoidance of decisions due to economic interests. In addition, study participants may have had different levels of knowledge with respect to steelhead conservation. Nonetheless, we are confident that our process included a diversity of settler perspectives on the subject.

Overall, our research provides a unique perspective into the limitations of Canada's SARA processes through the collection and analysis of qualitative data from those with direct experience and first-hand knowledge of the process. Limitations and suggestions discussed here can be used to reform current processes to allow for the better protection of species at risk in Canada, especially Canada's aquatic species as noted by Mandrak (2025). As it stands, aquatic species, especially those of economic and/or social importance, are least likely to be listed under Canada's SARA (Findlay et al. 2009). However, identified solutions can re-write the script, thus ensuring the persistence of native fishes and the value they bring to Canada and Canadians for generations to come. It is important to acknowledge that using Steelhead and emergency assessments to come to conclusions about the general SAR listing process could be problematic as it is not the usual path. Nonetheless, the issues identified by participants are presumably germane (see Mandrak 2025) and somewhat transferable to other cases.

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The data that have been used are confidential as per our ethics approval and commitment to the respondents.

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The authors declare no competing interests. The perspectives shared by the authors in this paper may not reflect the perspectives of their current employers.

Supplementary material

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