

Context

In 2018, an [Imminent Threat Assessment](#) (ITA) was completed that concluded that Southern Resident Killer Whales (SRKW) are likely facing imminent threats and unless mitigated, the threats may make survival and recovery of the population unlikely or impossible. As a result, measures were put in place beginning in 2018 to address the threats to SRKW: these measures are ongoing.

In a June 2024 letter, Ecojustice, on behalf of six environmental non-governmental organizations, requested that a recommendation be made to the Governor in Council to make an Emergency Order under s.80 of the *Species at Risk Act* (SARA) for SRKW, indicating that, despite the measures that are currently in place, SRKW remain in crisis. The receipt of this letter initiated an ITA for this population.

Methods

Fisheries and Oceans Canada (DFO) and Parks Canada, in consultation with Transport Canada and Environment and Climate Change Canada, completed an evaluation (Table 1) to determine whether the conclusions of the 2018 ITA are still relevant in 2024, or whether updated information would require a new assessment. This evaluation was guided by the [“Policy on assessing imminent threats under Sections 29 and 80 of the Species at Risk Act: terrestrial species”](#) (Government of Canada 2023), given no equivalent policy exists for aquatic species, and given the consideration for proceeding with an ITA described in the policy are not dependent on the environment, aquatic or terrestrial, in which the species is found.

As per the policy, in order to proceed with an ITA, the departments must be in possession of sufficient and credible information on the following:

- The species’ biology and ecological needs;
- The specific nature of the threat(s) the species is facing;
- The likelihood and timing of those threats, and
- The impacts of those threat(s) on the species.

Program officials compared the information included in the 2018 ITA to information available in 2024, including the information provided by Ecojustice, related to these criteria to determine whether a new ITA was necessary. This analysis focuses on threats and measures in Canadian waters.

Results and Conclusion

Based on the information reviewed and analysis undertaken as part of this evaluation, DFO and Parks Canada determined that the conclusions drawn from the 2018 ITA are still relevant in 2024, and imminent threat still exists. Despite significant additional efforts made since 2018 to address threats to SRKW, no significant changes have been determined relating to the nature of the threats, the likelihood and timing of those threats, and the impacts of those threats. In addition, the SRKW population continues to decline. This could be because it is still too early to observe the biological effects of the 2018 measures, as SRKW are long-lived animals that reproduce slowly, and their recovery is expected to take time.

Table 1. Criteria used to evaluate whether Southern Resident Killer Whale (SRKW) are facing imminent threats to survival or recovery. This table compares findings from the 2018 Imminent Threat Assessment (ITA) for SRKW and updates of relevance from 2018 to 2024, to support an evaluation of whether the conclusions of the 2018 ITA are still relevant in 2024.

Criteria, as per the “Policy on assessing imminent threats under Sections 29 and 80 of the <i>Species at Risk Act</i> : terrestrial species”	Description from the SRKW ITA (2018)	2024 updates
<p>A description of the <u>species</u> that is the subject of the request, to the extent that the information below is not already found on the Species at Risk Public Registry, including:</p> <ul style="list-style-type: none"> a. Information on its biological and ecological needs, including its habitat requirements, and if applicable, information relevant to local occurrences or populations that are the subject of the request b. The species’ status and protections under federal legislation c. The species’ status and protections under provincial, territorial and municipal legislation, as applicable 	<ul style="list-style-type: none"> a. The SRKW ITA (2018) summarizes key aspects of the species biological and ecological needs (Part 2 of the 2018 ITA, Overview of the SRKW); population status and trend (Part 3 of the 2018 ITA); SRKW distribution (Part 3.1); habitat requirements, including critical habitat (Part 3.2 of the 2018 ITA). It sources this information from documents found on the Species at Risk Public Registry, as well as citation of scientific literature and government publications. b. The SRKW ITA (2018) summarizes species status and protections under federal legislation (Part 1, Background), including the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assessment as endangered and listing in Schedule 1 of the <i>Species at Risk Act</i> (SARA). The 2018 ITA references and describes status and protection under the “Recovery Strategy for the Northern and Southern Resident Killer Whales (<i>Orcinus orca</i>) in Canada: (DFO 2011), the “COSEWIC Assessment and Update Status Report on the Killer Whale <i>Orcinus orca</i> in Canada” (COSEWIC 2008), the “Action Plan for the Northern and Southern Resident Killer Whale (<i>Orcinus orca</i>) in Canada” (DFO 2017a), and the “Review of the Effectiveness of Recovery Measures for Southern Resident Killer Whales” (DFO 2017b). c. Not applicable. 	<p>The information included in the 2018 ITA regarding species biological and ecological needs, habitat requirements, and distribution remains relevant for management decision-making. Additional relevant information that has become available since 2018 to support the 2024 ITA is described below.</p> <ul style="list-style-type: none"> a. Biological and ecological needs: Since 2018, many studies have been published that build upon knowledge of species biology and ecology, seasonal distribution, and habitat requirements (e.g. Thornton et al. 2022a; COSEWIC 2023). While knowledge has been expanded, the fundamental understanding of this population and its needs has not changed in such a way that would contradict the 2018 imminent threat conclusion. b. Population status and protections: The current SRKW population size (N=73) is similar to the 2017 population size (N=76). In 2023, COSEWIC reported an observed decline in the total number of mature individuals of 20-26% in one generation (1992-2021) (COSEWIC 2023). The current population is considered small and declining, with breeding segregation from other killer whale ecotypes. Only 73 individuals remain, which is close to the known historic low of 71 in 1974. Given the population size, the number of animals contributing reproductively is also low. It is uncertain if the current demographics of the population, with only 23 breeding females, are sufficient to ensure survival or meet the recovery objective. <p>The most recent SRKW body condition assessment report conducted by SR3 Sealife Response, Rehabilitation, and Research between June 2023 and May 2024 identified 14 whales of notable poor body condition that raised concern (8 are females of reproductive age or have young dependent calves) (Fearnbach and Durban 2024). Individuals assessed to be in poor body condition have an elevated risk of mortality (Stewart et al. 2021).</p> <p>In December 2023, COSEWIC re-examined and confirmed its 2001 and 2008 assessments of the SRKW population as endangered (COSEWIC 2023). There have been no changes to the SARA listing status since the 2018 ITA. Since the 2018 ITA was published, the SARA recovery strategy was amended to add an additional area of critical habitat (waters on the continental shelf off southwestern Vancouver Island, including Swiftsure and La Perouse Banks). The new critical habitat was legally protected in 2018.</p> <ul style="list-style-type: none"> c. Not applicable.
<p>A description of the <u>threats</u> that are the subject of the request, including:</p> <ul style="list-style-type: none"> a. The specific nature of the threat(s) the species is facing b. The likelihood and timing of those threats c. The impacts of those threat(s) on the species 	<p>The SRKW 2018 ITA summarizes threats as identified in the recovery strategy (Part 3.4 of the 2018 ITA). It focuses on the three main threats:</p> <ul style="list-style-type: none"> ○ Reduced prey availability ○ Acoustic and physical disturbance ○ Environmental contaminants 	<p>Threat description information, and associated information about the likelihood, timing and impacts of those threats included in the 2018 ITA remain relevant for management decision-making.</p> <p>In 2023, COSEWIC completed a status report on SRKW and identified the same primary threats to the species: reduced prey availability (including abundance and accessibility), physical and acoustic disturbance, and contaminants. Recent information (2018-2024) on each threat is summarized at a high level below.</p> <p>Reduced prey availability: Many Chinook salmon stocks in British Columbia and Washington State have declined in abundance and several Fraser Chinook designatable units (DUs) have been assessed by COSEWIC as at risk (special concern, threatened, or endangered) and are under consideration for listing under SARA (Welch et al. 2020, Atlas et al. 2023, COSEWIC 2023). However, these declines are not homogeneous, with many sub yearling stocks showing stable or</p>

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		<p>increasing abundance (e.g. Fraser Summer 4.1), while yearling stocks (e.g. Fraser Spring 5.2) continue to have low abundance (Atlas et al. 2023, CTC 2023). Historically, SRKWs have tended to arrive in the Salish Sea in May/June to prey on more lipid-rich yearling stocks (e.g., Fraser River Spring 52 and Summer 52 stock management units), yet these have generally had below average abundance since the early 2000s (Shields et al. 2018). In recent years, SRKW have been spending less time in the region during the spring months and modelling has shown correlation with low abundances of Spring 52 and Summer 52 Fraser River Chinook (Shields et al. 2018).</p> <p>Ecosystem models suggest declines in Chinook salmon abundance have contributed to poor body condition in SRKW (Couture et al. 2022). Chinook salmon abundances were correlated with J Pod body condition changes, though the strength of these relationships varied depending on how Chinook salmon stocks were aggregated (Stewart et al. 2021). Photogrammetry body condition images were also correlated with near-term mortality risk (Stewart et al. 2021). Annual body condition reports are provided to DFO, with the most recent assessment report listing 14 whales of notable concern (from summer to spring 2023/24), with 8 of the 14 whales being females of reproductive age or having young dependent calves (Fearnbach and Durban 2024).</p> <p>Acoustic and physical disturbance: SRKW are still subject to vessel-related physical and acoustic disturbance from human activities, principally from shipping, ecotourism, and recreational use of habitat. To date, underwater noise levels since 2018 appear to be fairly consistent, however no comparison, or analysis has been complete to date to state the significance of changes year to year (the variation is about 2-3 dB year to year and the seasonal difference is about 10dB, both of which may still have effect on SRKW) (Boldt et al. 2024).</p> <p>Additional major development projects have received positive environmental assessment decisions following the 2018 ITA which have marine shipping components within SRKW critical habitat, including the Trans Mountain Expansion (TMX; for which marine shipping has already started), Roberts Bank Terminal 2 (RBT2), and Tilbury Marine Jetty. The environmental assessments for each of these projects found significant adverse cumulative environmental effects with respect to SRKW, and in the case of RBT2, the assessment also found significant adverse effects. The additional marine traffic from these projects has the potential to increase physical and acoustic disturbance to SRKW in their critical habitat in future years.</p> <p>Using data from 2018-2020, DFO-led research concluded that noise from both large commercial vessels and small recreational vessels resulted in a significant loss of both echolocation and communication range in SRKW critical habitat (Thornton et al. 2022b, Burnham et al. 2023), with impacts to foraging success (Burnham et al. 2023). Acoustic masking has the ability to interfere with the sending and receiving of information about their surroundings, and make prey effectively less available. Cessation of foraging has been noted for SRKW in the presence of vessels (Hold et al. 2021a,b). SRKW limit prey capture behaviour when vessels are less than 366 m away (Holt et al. 2021a). SRKW prey capture probability decreased as speed of proximate vessels increased, and prey capture probability increased as estimates of preferred prey and vessel distance increased (Holt et al. 2021b).</p> <p>Environmental contaminants: In 2020, the Government of Canada SRKW Contaminants Technical Working Group (TWG) conducted a review of published scientific literature and combined the findings with expert knowledge from the TWG to yield a list of priority contaminants of concern to SRKW and their primary prey, Chinook salmon (ECCC 2020). Contaminants identified as a major concern to SRKW include persistent organic pollutants such as PCBs (polychlorinated biphenyls), DDT (dichloro-diphenyl-trichloroethane), perfluorooctane sulfonate, and perfluorooctanoic acid. High tissue levels of PCBs have negative impacts on reproduction and immune function (Desforges et al. 2018). Contaminants</p>

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		<p>identified as a major concern for SRKW primary prey Chinook salmon, which can affect prey availability, also include copper, phthalates, bisphenols, and current-use pesticides and their adjuvants, as well as PCBs, DDT, and Per- and polyfluoroalkyl substances (PFAs).</p>
<p>A description of the <u>impacts of the threats</u> on the species’ recovery and/or survival, including potential impacts to critical habitat</p>	<p>The 2018 ITA includes detailed analysis of the impacts of the threats on species recovery and survival (Part 4 of the 2018 ITA). It does so by evaluating and making conclusions for the following questions:</p> <p>Question 1: Is the species currently facing threats that might impact survival or recovery of the species?</p> <p><i>Summary conclusion:</i> The species is currently facing threats that might be impacting survival and/or recovery.</p> <p>Question 2: Will the effect of the current threats make survival of the species unlikely or impossible?</p> <p><i>Summary conclusion:</i> Given the above considerations [relating to COSEWIC’s assessment of population size and recent trends; concerns relating to lack of population stability, resilience, and population redundancy and connectivity; and predicted population trajectories], threats to the survival of the SRKW population could be considered imminent.</p> <p>Question 3: Will the effect of the current threats make recovery of the species unlikely or impossible?</p> <p><i>Summary conclusion:</i> Given the above considerations [relating to recovery goal and population size / demographics], threats to the recovery of the SRKW population could be considered imminent.</p> <p>Question 4: Do the threats require intervention?</p> <p><i>Summary conclusion:</i> Despite ongoing and planned mitigation measures, the key threats affecting the SRKW population are, to date, not being fully abated; further, the effectiveness of these actions has not yet been evaluated, which can take many years. Given the long life-span of the species, recovery is a long-term goal and effects of reducing the threats on the</p>	<p>Updates by question are outlined below.</p> <p>Question 1: Is the species currently facing threats that might impact survival or recovery of the species?</p> <p>The species is currently facing threats that might be impacting survival and/or recovery (see information on threats above).</p> <p>Question 2: Will the effect of the current threats make survival of the species unlikely or impossible?</p> <p>DFO Science modelled the cumulative effects of anthropogenic impacts on SRKW. The model predicted that with no management action, the SRKW population would decline with a 26% probability of extinction, and in those projections, extinction was estimated to occur after 86 (± 11) years (Murray et al. 2019; 2021). Although management actions have been put in place since 2018, it is too early to determine whether threats have been reduced by those actions, given SRKW are long-lived animals that reproduce slowly and thus it is expected that recovery will take time.</p> <p>Inbreeding depression can restrict SRKW population growth and predicts further decline if the population remains genetically isolated and current environmental conditions continue (Kardos et al. 2023). Williams et al. (2024) used a population viability analysis model to test the sensitivity of the population to variability in age structure, survival rates, and prey-demography functional relationships, predicting a mean annual population decline of roughly 1% with a period of accelerating decline. They suggest that immediate intervention measures are required to address the extinction of this population.</p> <p>Threats to the survival of the SRKW population could be considered imminent.</p> <p>Question 3: Will the effect of the current threats make recovery of the species unlikely or impossible?</p> <p>The response in the 2018 ITA (population size and demographics) has not changed and therefore the same conclusion can be drawn. Given the small population size, low number of individuals contributing to reproduction, and poor survival of neonates, it is unlikely the population will increase unless the cumulative impacts of threats are addressed over an extended period of time.</p> <p>Question 4: Do the threats require intervention?</p> <p>Actions to mitigate threats have been underway since 2018. Examples of actions under each threat category are listed below.</p> <p>Measures to address reduced prey availability:</p> <ul style="list-style-type: none"> - Reducing fisheries for Chinook Salmon; closing fisheries in key foraging areas to decrease prey competition and physical acoustic disturbance; asking fishers to voluntarily stop fishing and not haul gear within 1 km of killer whales; increasing Chinook Salmon hatchery production; and restoring coastal salmon habitat (2018 to 2024)

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	<p>population to ensure survival and advance recovery would not occur over the short term</p>	<ul style="list-style-type: none"> - Investments in the sustainability of wild Pacific salmon, including salmon habitat restoration, stock monitoring, and enhancement (e.g. Pacific Salmon Strategy Initiative, British Columbia Salmon Restoration and Innovation Fund) - Addition of allocated resources to support SRKW protection, compliance monitoring, and enforcement including the DFO-CCG Marine Mammal Desk and the DFO-C&P Whale Protection Unit (also applies to mitigation of physical and acoustic threats) - Parks Canada collaboration with First Nation partners to implement a salmon stream restoration project in Pacific Rim National Park Reserve <p>Measures to address physical and acoustic disturbance:</p> <ul style="list-style-type: none"> - Enacting an Interim Order in southern BC coastal waters, including increasing vessel approach distances for Killer Whales to 400 m (2018-2024), implementing Interim Sanctuary Zones (2018 to 2024), restricting vessel speeds in areas frequented by SRKW (2022-24), and prohibiting vessels from impeding the path of Killer Whales (2023-2024) - Implementing an agreement with participating whale watch operators, prohibiting them from offering tours on SRKW - Conducting research to better understand the impacts of underwater noise and the effectiveness of mitigation measures - Implementing the “<i>Species at Risk Act</i> Section 11 Conservation Agreement to Support the Recovery of the Southern Resident Killer Whale” with the Vancouver Fraser Port Authority (VFPA) and six other member organizations of the VFPA-led Enhancing Cetacean Habitat and Observation (ECHO) Program in 2019 and renewing in 2024 for another five years <ul style="list-style-type: none"> o Voluntary initiatives under the ECHO Program have helped reduce underwater noise from large commercial vessels, such as: the Haro Strait, Boundary Pass, and Swiftsure Bank voluntary ship slowdowns and the Strait of Juan de Fuca voluntary inshore lateral displacement initiative - Promoting land-based whale watching in Pacific Rim and Gulf Islands National Park Reserves and Fort Rodd Hill and Fisgard Lighthouse National Historic Sites - Providing education and outreach programming to improve awareness and compliance of SRKW management measures and threats facing SRKW - Canada committed to assess and monitor measures to avoid or lessen the impacts of major projects (such as TMX, RBT2, and Tilbury Marine Jetty) and adaptively manage these measures in a manner consistent with the recovery strategy and action plan <ul style="list-style-type: none"> o Work is underway to evaluate the effectiveness of existing measures in addressing these projects' impacts; it is not yet known if additional measures or expansion of existing measures will be required to better address threats and support recovery <p>Measures to address contaminants:</p> <ul style="list-style-type: none"> - Conducting monitoring for contaminants in various environmental compartments (air, surface freshwater, freshwater sediment, wastewater, landfill leachate) to further our understanding of contaminants in SRKW habitat and their impacts - Conducting monitoring of legacy and emerging contaminants of concern in SRKW marine waters, sediments, prey (salmon), and other indicator species, to understand pathways and trends of contaminants in SRKW. - Launching and continuing the development of the Pollutants Affecting Whales and their Prey Inventory Tool to identify and prioritize contaminants and their sources that are potentially affecting SRKW and Chinook Salmon, as

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		<p>well as identifying hot spots, characterizing pollutant cumulative impacts, and where environmental guidelines are exceeded</p> <ul style="list-style-type: none"> - Placing stronger controls on contaminants impacting whales, including publishing proposed amendments to the Prohibition of Certain Toxic Substances Regulations in 2022 to strengthen regulatory controls for five persistent organic pollutants - Continuing to fund and support the Chemicals Management Plan and other pollution prevention initiatives that have implemented dozens of risk management actions over the years to protect these marine mammals and the rest of the environment from harmful pollutants - Reducing contaminant releases via wastewater systems, as required under the Wastewater Systems Effluent Regulations - Strengthening capacity to better detect and target offenders with the highest noncompliance for contaminants of concern to endangered whales - Development of a framework to derive Environmental Quality Guidelines that are protective of apex marine mammals (McTavish et al. 2024) <p>Despite additional efforts made since 2018, the key threats affecting SRKW are not currently being fully abated, and the population continues to decline. As mentioned above, given the long lifespan of the species, recovery is a long-term goal and efforts to mitigate threats must continue.</p>

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