

# SOUTHERN RESIDENT KILLER WHALES

2020 Southern Resident Killer Whale  
Contaminants Technical Working Group  
Accomplishment Highlights and Recommendations



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# 2020 Southern Resident Killer Whale Contaminants Technical Working Group Accomplishment Highlights and Recommendations

One of the threats Southern Resident Killer Whales (SRKW) are facing for their survival and recovery, as described in the SRKW [Imminent Threat Assessment](#), is exposure to contaminants. In 2018, the Southern Resident Killer Whale Contaminants Technical Working Group (TWG) was established to investigate the contaminants threat. The Contaminants TWG mandate was to:

1. Identify key contaminants of concern, including emerging contaminants;
2. Identify and evaluate the contribution of various contaminant sources to the SRKW, their habitat and their prey;
3. Develop a framework to assess the effectiveness of existing controls on contaminants that affect SRKW; and
4. Develop recommendations for additional measures to address contaminants affecting SRKW, their habitat and their prey.

The Contaminants TWG was led by ECCC and included representation and engagement from a range of agencies, environmental organizations, and academia including:

- BC Environment and Climate Change Strategy
- BC Ministry of Municipal Affairs and Housing
- Burrard Inlet Water Quality Roundtable
- Environment and Climate Change Canada
- Fisheries and Oceans Canada
- Georgia Strait Alliance
- Health Canada
- Metro Vancouver Regional District
- Ocean Wise
- Simon Fraser University
- University of British Columbia
- Washington Department of Ecology
- Washington Department of Fish and Wildlife

## 1. Identification of key contaminants of concern

A review of published scientific literature along with expert knowledge from the TWG yielded a priority list of contaminants of concern to SRKW and their primary prey, Chinook salmon. This list is updated as new science and monitoring data become available. The contaminants of concern for SRKW and Chinook salmon are categorized by level of concern in the table below:

### ***Prioritized List of Contaminants of Concern to Southern Resident Killer Whales and Chinook salmon***

Level of Concern to SRKW Health	Contaminants of Concern to Southern Resident Killer Whales	Contaminants of Concern to Chinook Salmon
Tier 1 - Major concern	<i>PCBs<sup>1</sup>, DDT<sup>1</sup>, PFOS<sup>1</sup>, PFOA<sup>1</sup></i>	<i>PCBs, DDT, PFOS, PFOA, Copper, phthalates (DEHP), bisphenol family (BPA), Current-Use Pesticides</i>
Tier 2 – Medium concern	<i>PBDEs<sup>1</sup>, HBCD<sup>1</sup>, mercury and organic mercury</i>	<i>PBDEs, HBCD, mercury and organic mercury, Pharmaceuticals and Personal Care Products</i>
Tier 3 – Minor concern	<i>chlorinated alkanes, 4-nonylphenol, dieldrin, tributyltin, dibutyltin, triclosan, current use pesticides, biological contaminants</i>	<i>PAHs<sup>1</sup>, hydrocarbons, volatile organic compounds, cadmium, lead, microplastics, biological contaminants</i>

Beyond the original mandate of identifying key contaminants of concern, over 200 guidelines (including criteria/objectives/reference values) in a variety of environmental compartments (e.g. water, sediment, diet and fish tissue) were compiled for all Tier 1 and 2 contaminants (i.e. those identified to be of major or medium concern). A scientific decision-making framework was developed to determine where existing guideline values can protect whales and their prey and where new or updated guidelines are needed.

## **2. Evaluation of contaminant sources**

Sources of contaminants in the Fraser Basin and coastal areas of the Salish Sea were quantified using data from federal, provincial, and municipal regulatory reporting, published reports, and open data government sources. Data were compiled into an inventory of pollutants affecting SRKW and their prey. Where data were insufficient, releases were estimated from published reports and scientific studies. In addition, a mapping tool (the Pollutants Affecting Whales and their Prey Inventory Tool – PAWPIT) was created to visualize sources of contaminants, ambient loads, and comparisons of contaminant concentrations to environmental quality guidelines.

## **3. Effectiveness Evaluation Framework**

An Effectiveness Evaluation Framework (EEF) was developed to:

- Assess whether existing actions are effective in reducing contaminant levels below thresholds of concern; and
- Assess whether levels of contaminants are above thresholds of concern for the recovery and survival of SRKW and their prey.

A pilot study using PCBs and copper was conducted to further refine the EEF.

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<sup>1</sup> PCBs – polychlorinated biphenyls; DDT – dichlorodiphenyltrichloroethane; PFOS – perfluorooctanesulfoic acid; PFOA – perfluorooctanoic acid; PBDEs – polybrominated diphenyl ethers; HBCD – Hexabromocyclododecane; PAHs – polycyclic aromatic hydrocarbons

## 4. Recommendations

To move recovery efforts forward, the Contaminants TWG identified and agreed on four areas of work that represent remaining gaps for SRKW recovery, with respect to the threat of contaminants:

- **Develop and implement further controls** to reduce the threat of contaminants;
- **Conduct research and monitoring** to further our understanding of contaminants in the environment and their impacts;
- **Share data, information, and knowledge** amongst partners to inform decision-making; and
- **Undertake outreach, education, and engagement** to inform the public and involve them in solutions.

The recommendations both recognize the considerable work underway by all TWG participants and also indicate that new activities by TWG participants are necessary as both the science and the solutions expand.

Recommendations	Actions underway	New actions
Develop and implement further controls	Finalize a decision-making scientific framework to inform guidelines by identifying where existing guideline values can be accepted and where new or updated guidelines are needed	Develop a diet and sediment environmental quality guideline derivation protocol for bioaccumulative substances that is protective of higher trophic level marine mammals (i.e. SRKWs)
	Advance work on the Burrard Inlet Water Quality Objectives for contaminants of concern	Recommend the use of guidelines for contaminants to protect SRKW and Chinook salmon and make these guidelines public
	Implement and enforce the <a href="#">Prohibition of Certain Toxic Substances Regulations (2012)</a> to combat contaminants of concern, such as PFAS	Fill priority data gaps as identified in the TWG's decision-making scientific framework
	Enhance regulatory controls for contaminants as necessary	
	Prevent and reduce plastic waste through the <a href="#">Ocean Plastics Charter</a> and the <a href="#">Canada-wide strategy on zero plastic waste</a>	Compare environmental concentrations to the suite of recommended guidelines
	Use the Framework for Environmental Risk Assessment of Pesticides to assess risks to ecological receptors and to identify	Adopt or add guidelines that protect SRKW as policy
		Develop regulatory controls for contaminants as necessary

	<p>potential risk management measures as required</p> <p>Encourage and coordinate with other nations to reduce contamination (e.g., via international instruments such as Stockholm, Minamata)</p> <p>Consider SRKW in wastewater management by upgrading wastewater treatment plants in the Salish Sea area at a minimum as required through the <a href="#">Wastewater Systems Effluent Regulations (2012)</a></p> <p>Make informed decisions that take into account available scientific data</p>	<p>Prevent and reduce plastic waste in the marine environment</p> <p>Consider bans on certain plastic materials</p> <p>Create improvements and/or expand <a href="#">Extended Producer Responsibility</a> programs to include some single-use plastics and make changes to the deposit systems in BC</p>
Share data, information and knowledge amongst partners to inform decision-making	<p>Continue to make data publicly available and easily accessible</p> <p>Incorporate data into the Pollutants Affecting Whales and their Prey Inventory Tool (PAWPIT) as feasible</p> <p>Foster and develop local relationships in BC to promote and encourage collaboration and efficiencies to reduce contaminants</p> <p>Collaborate to coordinate water quality and biological monitoring amongst stakeholders and develop processes, procedures, tools to share data</p> <p>Continue to produce the publicly available Pesticide Sales and Use Survey reports to share updated data on the types of pesticides that are sold and used in BC</p>	<p>Increase collaboration amongst partners (including regulators and those collecting monitoring data) as well as sharing data, information and expertise</p> <p>Share previously internal data publicly</p> <p>Organize and maintain a focused multi-stakeholder group for collaboration and advice</p> <p>Investigate the coordination of environmental monitoring of pesticides</p> <p>Share provincial contaminated sites and authorized discharge data electronically</p>
Conduct research and monitoring to further our	Conduct research and monitoring of contaminants of concern to	Identify research gaps (i.e. key research questions)

understanding of contaminants in the environment and their impacts	SRKW and Chinook salmon and their habitats (e.g. <a href="#">Ocean Wise</a> Conservation Association's monitoring programs, the Government of Canada's Whale Initiative, university experts)	Investigate the feasibility of a standard testing protocol for microplastics in water, sediment and aquatic animal tissues
	Maintain coordination amongst researchers and use standardized methods for sampling where available and appropriate	Use information from PAWPIT to inform further activities
	Identify hotspots for contaminants of concern and where action needs to be taken to mitigate these effects	Develop a model for total maximum daily loading of contaminants of concern (i.e. the max amount of chemicals that could be released to the system)
Undertake outreach, education, and engagement to inform the public and involve them in solutions	Building an empowered, active and knowledgeable community through creative, inclusive, and impactful communication tools and outreach events	Undertake and support further outreach and education initiatives regarding contaminants
	Continue the established education and outreach programs (e.g. Ocean Wise Conservation Association's Plastic Wise initiative, Shoreline Cleanups, Ocean Education and Leadership programs for children and youth, and Pollution Tracker)	Develop interpretive signs and in-person interpretive programs