

January 30, 2018

The Honourable Dominic LeBlanc  
Minister of Fisheries and Oceans Canada

The Honourable Catherine McKenna  
Minister of Environment and Climate Change  
and Minister Responsible for Parks Canada

Dear Ministers LeBlanc and McKenna:

**Re: Actions to address threats to Southern Resident Killer Whales**

The David Suzuki Foundation, Georgia Strait Alliance, Natural Resources Defense Council, Raincoast Conservation Foundation and World Wildlife Fund Canada have requested that I provide a letter bearing on the rationale for and urgency of management actions to address threats to Southern Resident Killer Whales. I presented my opinions on this matter at the Southern Resident Killer Whale Protection Symposium in Vancouver in October 2017, at the Biennial Marine Mammal Conference in Halifax in October 2017, and at the Workshop on the Availability of Prey for Southern Resident Killer Whales at the University of British Columbia (UBC) in November 2017. These opinions are summarized below.

My Experience and Expertise

I am Director of the Cetacean Research Program at Ocean Wise (formerly the Vancouver Aquarium), a position I have held since 2001. I am also adjunct professor in the Department of Zoology at the University of British Columbia. Prior to my employment at Ocean Wise, I spent a year as a marine mammal research scientist at Fisheries and Oceans Canada.

With respect to Southern Resident Killer Whales in particular, I co-chaired the Resident Killer Whale Recovery Team that produced the Recovery Strategy for Southern Resident Killer Whales in 2011. More recently, I served on a panel that drafted the Resident Killer Whale Recovery Action Plan.

Throughout 28 seasons of field research I have studied the ecology and behavioural and population biology of killer whales in British Columbia and Alaska. Highlights of this research included discovering substantial differences in the echolocation behaviour of fish-eating and mammal-eating killer whales, determining that at least nine genetically-discrete but geographically-overlapping populations of killer whales inhabit the northeastern Pacific Ocean, and showing that two populations of fish-eating resident killer whales avoid inbreeding through an elaborate clan-based mating system.

My current field research on the Southern Resident Killer Whales uses drone-based aerial photogrammetry to precisely measure the length, shape and width of individually identified killer whales. Comparison of these measurements within and between seasons enables my collaborators and me to detect pregnancies, to estimate growth rates, and to compare variation in body condition with variation in prey abundance.

In addition to my research duties, I serve on several advisory panels and committees. These include the Port of Vancouver's ECHO Program Advisory Working Group (and Acoustics Technical Committee); the

Port of Prince Rupert's Sustainability and Marine Mammal Stewardship Committees; Green Marine's Acoustics Technical Group; and Environment Canada's Species at Risk Advisory Committee. A copy of my CV is appended to this letter.

### Basis for the Opinions Presented

The opinions presented here are informed by experiences and expertise gleaned throughout my career and specifically through: leading and participating in field studies of Southern, Northern and Southern Alaskan Resident Killer Whales; observations made in the course of those studies; familiarity with the scientific and conservation literature pertaining to Southern resident and other killer whale populations; active participation in scientific and recovery planning conferences, symposia and workshops; participation in recovery teams, expert advisory groups and panels; and membership in both an academic community at UBC and a broad international community of research collaborators.

### Southern Resident Killer Whale Population Trends

When last seen in the late summer and fall of 2017, the Southern Residents numbered only 76 individuals, their lowest level in more than three decades. The population has previously been as low as 70 following live captures efforts from 1962-1974, when 47 were removed for display in oceanariums and aquariums. Their numbers increased from 1975 until the mid-1990s, fell for 6 years, increased slightly until 2005 and has declined since.

Following a recent "baby boom" of nine calves live born beginning in December 2014 and ending in 2016, the Southern Residents have suffered a series of setbacks. Three calves that initially survived have since died (J54 and J55 in 2016, J52 in 2017). The addition of six surviving calves to the population has been more than offset by the deaths of 11 other population members in the same period. One particularly alarming recent trend is high mortality of reproductive-aged females. Two died in 2014 (J32, carrying a near-term fetus and L53) and two in 2016 (J28 and J14). Reproductive-aged resident females are of course essential for population growth and generally have very low mortality rates in resident killer whales. Another concerning observation is that one of the three southern resident pods (K pod) has not produced any surviving calves since 2011.

### Threats and Vital Rate Drivers

The Resident Killer Whale recovery strategy of 2011 identifies three principal threats to resident killer whales: contaminants (including oil spills), prey depletion, and anthropogenic noise and disturbance. Since the release of the Strategy, and based on several lines of evidence, most researchers believe that reduced prey availability in the summer foraging areas of Southern Resident Killer Whales, and anthropogenic noise and vessel disturbance that reduces foraging efficiency, are the most significant causal factors in the recent declines of the population and represent the greatest obstacles to the population's recovery.

### The Case for Long and Short-Term Measures to Increase Prey Availability

Many factors contribute to variability in the run size of Chinook salmon stocks. Efforts to rebuild and restore diverse stocks to reduce that variability and to increase overall Chinook production have been underway for many years. Although these efforts have been primarily intended to support fisheries and conserve threatened Chinook stocks, maintaining and accelerating them provides the best hope for the

recovery and long-term survival of Southern Resident Killer Whales. In the meantime, the small size of the Southern Resident population, its declining trend, increases in its mortality rates and declines in its fecundity rates indicate an urgent precautionary need to increase its access to salmon in the short term.

### Travel Routes and Foraging Areas

Southern Resident Killer Whales tend to use consistent travel routes in the Salish Sea, and tend to expend much of their foraging effort in the same areas. These routes and foraging areas are well known to commercial whale watch operators and researchers alike. For example, Southern Residents coming into the Strait of Juan de Fuca from open water to the west in the spring or summer typically forage along the Vancouver Island shoreline as far as Sooke or Race Rocks, and then travel quickly across Haro Strait, often to the vicinity of Salmon Bank. They forage there and along the West side of San Juan Island to Turn Point and then travel across Boundary Pass to forage either along the southwest side of Pender Island in Swanson Channel or along the south side of Saturna Island. In the former case they often eventually pass through Active Pass into the Strait of Georgia, in the latter they may make their way past East Point into the Strait of Georgia. In either case, they often travel across the Strait to forage from Point Roberts to the mouth of the Fraser River. Although they may take salmon anywhere along their travel routes and may turn back the way they came at any time before they reach the Fraser, the fact that they intensify their efforts in consistent locations provides management opportunities, as discussed below. Southern Resident travel routes and specific foraging areas are less consistent and/or less well understood west of the Strait of Juan de Fuca, but Swiftsure Bank is known to be visited frequently by the population year round.

### Impacts of Vessel Proximity, Noise and Fishing on Foraging Efficiency

When foraging actively, Southern Residents usually spread out individually or in small groups, swim relatively slowly and echolocate actively. When they detect Chinook salmon they dive and a chase ensues. This chase is often highly energetic and may last for several minutes. In many cases the salmon is chased to the surface, and pursued rapidly just underneath it. If the whale has to alter course during a chase to avoid a boat, the salmon may escape. Such escapes can be difficult to detect positively by a boat-based observer, but are apparent when viewed from above, as with a drone. Many studies have demonstrated that anthropogenic noise such as that generated by power vessel has a masking effect on echolocation and reduces the range over which prey can be detected. The impact of this masking effect on foraging rates is likely to be most severe when prey are sparse, making long detection ranges especially important.

Sport fishing for Chinook is popular in the Salish Sea and is often concentrated in the Southern Residents' principal foraging areas, as described above. This fishing effort has several negative consequences for Southern Residents. First, salmon fishing vessels directly compete with the whales and reduce local salmon availability. Second, whales that pursue salmon near fishing vessels will abort chases from time to time, as described above. Third, noise from the vessels' engines, and potentially their sounders as well, reduce the whales' echolocation efficiency. Finally, Southern Residents moving towards or across a foraging site often alter course to avoid passing through aggregations of fishing boats. This displacement does not always occur and may be a consequence of one or all of the first three factors, but it is nonetheless evidence of a negative interaction.

### Practical Short-Term Measures to Increase Prey Availability

In view of the foraging patterns and behaviours described above and the anthropogenic factors known or believed to affect foraging efficiency, several short-term measures are available to increase the Southern Resident Killer Whales' access to salmon, as listed below. Some of these measures are untested and the magnitude of the benefits they will achieve is uncertain. However, given that the rationale for each measure is clear and the state of the population is dire, a precautionary approach is warranted. I know that these and other measures are receiving careful consideration by your Ministries. I commend you for that but also urge you to maintain momentum on this file and move to implementation as soon as possible.

- Fishing restrictions that increase the terminal run size of select Fraser Chinook stocks should be implemented. Stocks should be selected based on their projected importance to the whales, taking into account run size, run timing and fish size/quality.
- Fishing should be restricted or closed on the Southern Residents' key foraging sites, and whale watching should be restricted in these sites as well.
- Minimum approach distances to Southern Resident killer whales should be increased to reduce noise, disturbance and interference with foraging.
- The number of boats approaching Southern Resident killer whales at any given time should be reduced, for the same reasons as above. One way that this could be accomplished in the short term is by limiting the amount of time any given vessel can spend with whales. In the longer term, licensing commercial whale watching vessels and capping their numbers would also help.

### Measuring the Efficacy of Mitigation Efforts

All of the above protective measures will take significant resources to implement and enforce and some will cause hardship or lost opportunity to certain people. It therefore goes without saying that the efficacy of each protective measure should be carefully monitored and the measures should be adjusted over time as indicated. Monitoring could be done efficiently and effectively by programs such as Straitwatch and Soundwatch, both of which have well-established expertise monitoring whale watching vessels and have staff that can identify individual Southern Resident Killer Whales and accurately record their behaviours.

Finally, I would be pleased to provide further input on the opinions and observations presented here and welcome any opportunities to assist further.

Sincerely,

*[original signed]*

Lance Barrett-Lennard