

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF WASHINGTON
AT SEATTLE

WILD FISH CONSERVANCY
NORTHWEST, a Washington non-profit
corporation,

Plaintiff,

v.

BARRY THOM, in his official capacity as
Regional Administrator of the National Marine
Fisheries Service, et al.,

Defendants.

Case No. 2:20-cv-00417-MLP

**DECLARATION OF DR. DEBORAH
GILES, Ph.D.**

I, Deborah Giles, state and declare as follows;

1. I have been retained by Plaintiff Wild Fish Conservancy, by and through counsel, to provide my expert evaluation and opinion regarding the Southern Resident killer whale population. This declaration provides my opinions and conclusions, including scientific information regarding Southern Resident killer whales and their physiological health. I have actual knowledge of the matters stated herein and could and would so testify if called as a witness.

2. I received my PhD from the University of California Davis in 2014. My master's thesis and PhD dissertation both focused on Southern Resident killer whales. Currently, I am a killer whale scientist in the Center for Conservation Biology, and resident scientist and lecturer at

1 the University of Washington, where I teach Marine Mammals of the Salish Sea and Marine
2 Biology. In addition, I am the science and research director for the nonprofit Wild Orca, translating
3 science and engaging with the public and policy makers to prevent the extinction of the critically
4 endangered Southern Resident killer whales. I was formerly the killer whale research director at
5 the Center for Whale Research.
6

7 3. My professional background, experience, and publications are detailed in my
8 curriculum vitae, a true and accurate copy which is attached as Exhibit A to this declaration.

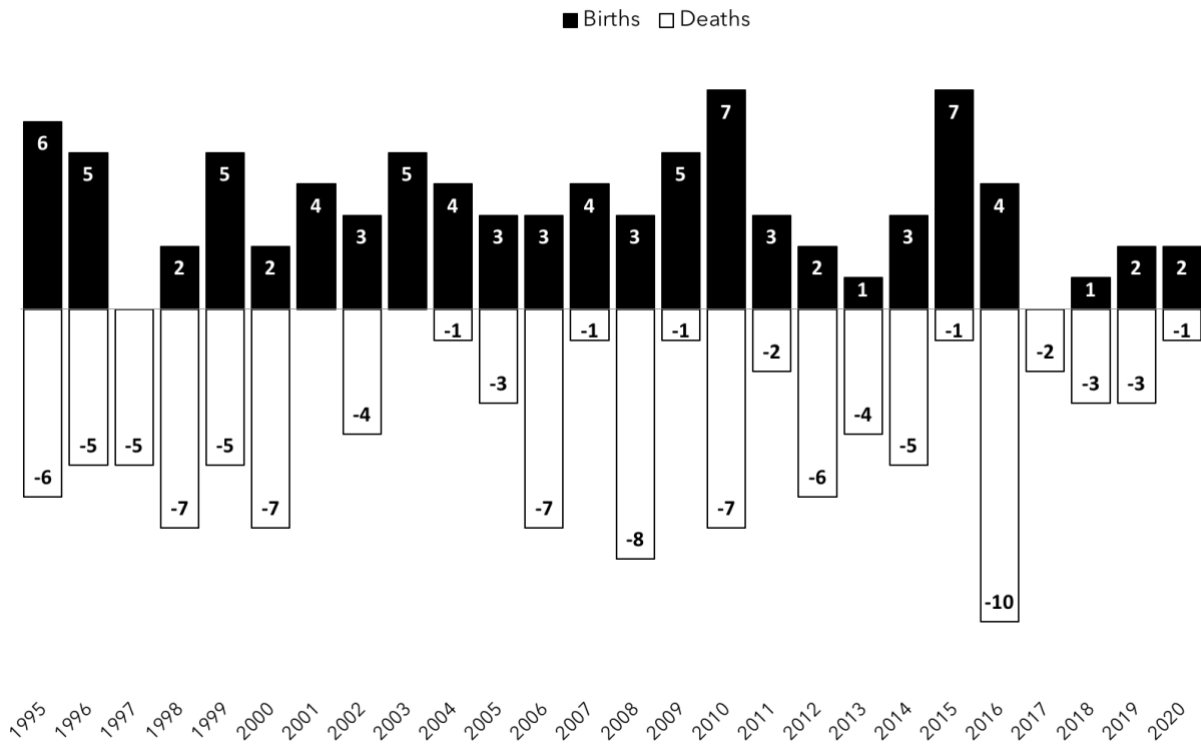
9 4. Since 2009, I've worked with Dr. Samuel Wasser and the University of
10 Washington's Conservation Canine team, utilizing detection dogs to locate floating killer whale
11 fecal matter to monitor the physiological health of Southern Resident killer whales. Southern
12 Resident killer whale feces can be genotyped to determine which whale the fecal sample came
13 from, and they can be examined for stress, nutrition and pregnancy hormones, toxicants,
14 microbiome, parasites, bacteria, and microplastics found in the whales. Analysis of fecal samples
15 confirms that Chinook salmon are the dominant fish species eaten by these whales.
16

17 5. Since 2010, I have worked with the National Oceanic and Atmospheric
18 Administration's National Marine Fisheries Service (NMFS) on a project deploying acoustic
19 suction-cup recording tags on killer whales, to measure received noise levels by whales. In 2018-
20 2019, I served on Washington State Governor Inslee's Southern Resident Killer Whale Recovery
21 Task Force on the prey and vessel working groups, and was an invited panelist for Governor
22 Inslee's Lower Snake River Dams Stakeholder Engagement workgroup.
23

24 NMFS listed the Southern Resident killer whales as endangered under the Endangered
25 Species Act (ESA) in 2005, when the population numbered 88 whales. Despite almost fifteen years
of federal protection, the population has continued to decline from a high census count in 1995 of

1 98 whales, to a near historic low of only 75 whales today, with three calves under a year old.
 2 NMFS has recognized the Southern Resident killer whales as one of eight marine species most at
 3 risk of extinction, and considers them a recovery priority number one, which is defined as “a
 4 species whose extinction is almost certain in the immediate future because of a rapid population
 5 decline or habitat destruction.” By NMFS’ own assessment, the population must increase by an
 6 average 2.3 percent per year for 28 years in order to be removed from the Endangered Species list,
 7 which is NMFS’ goal. Since listing in 2005, the average annual increase is -0.97 percent, with
 8 births and deaths almost equal in many years.
 9

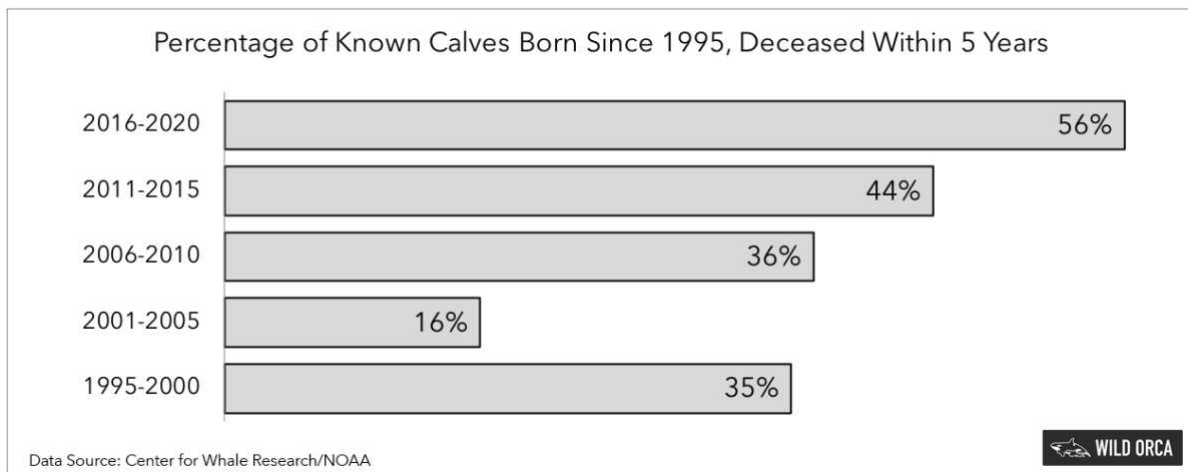
10
 11 Southern Resident Killer Whales: Identified Annual Births, Deaths: 1995-2020
 12 Excludes calves, dying before, at or shortly after birth without witness



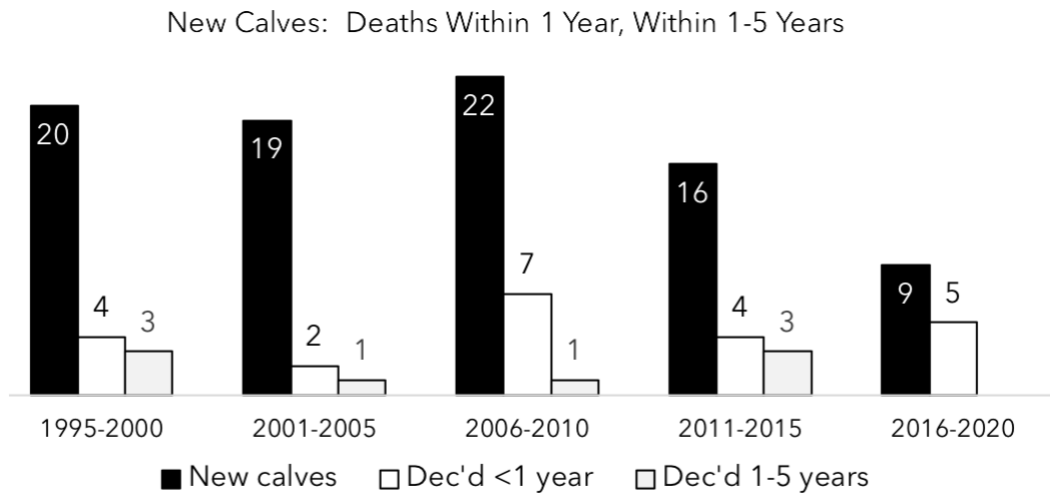
14
 15
 16
 17
 18
 19
 20
 21
 22
 23
 24
 25
 Data Source: Center for Whale Research/NOAA



1 As the independent governmental agency Marine Mammal Commission explained, a
2 primary cause of this well-documented population decline has been a steep decline in the number
3 of pregnancies, and a lack of live births in those whales that do become pregnant. At the height
4 of the population in 1995, there were 98 whales. Between 1995 and 2020, there were between
5 zero and seven births each year, with an average of 3.15 births per year. Yet, of the 82 calves
6 born in that 26-year time span, 36 died. Of these, 17 died within minutes or months of birth; 11
7 calves died under the age of 10, and eight died between 10 and 21 years old. Between 2005 (ESA
8 listing) and 2020, 47 whales were born and only 29 of those are currently alive. From 2013 to
9 2020, 17 calves were born, only nine of which are still living. Of the eight deceased, five deaths
10 occurred within minutes or months, two died before the age of two, and one lived into her fourth
11 year. Unfortunately, no calves were born in 2017, and the one calf born in late September of
12 2018 died shortly after its birth (as did the one calf born 2013, one of the two calves born in 2014
13 and both calves born in 2016). Two calves were born in 2019 and 2020 with another addition on
14 February 17th, 2021; as of April 28, 2021, these 5 most recent calves are thought to be still living.
15
16



1 Over the last decade, there has been an unsustainable loss of prime breeding age animals, as well
 2 as high calf mortality of animals under five years of age. When coupled with the high pregnancy
 3 failure rate, and high new-natal death rate, this population struggles to stabilize. Since the last ESA
 4 review in 2015, the average annual population growth has fallen to -1.22 percent, despite the
 5 addition of new calves.
 6



Data Source: Center for Whale Research/NOAA

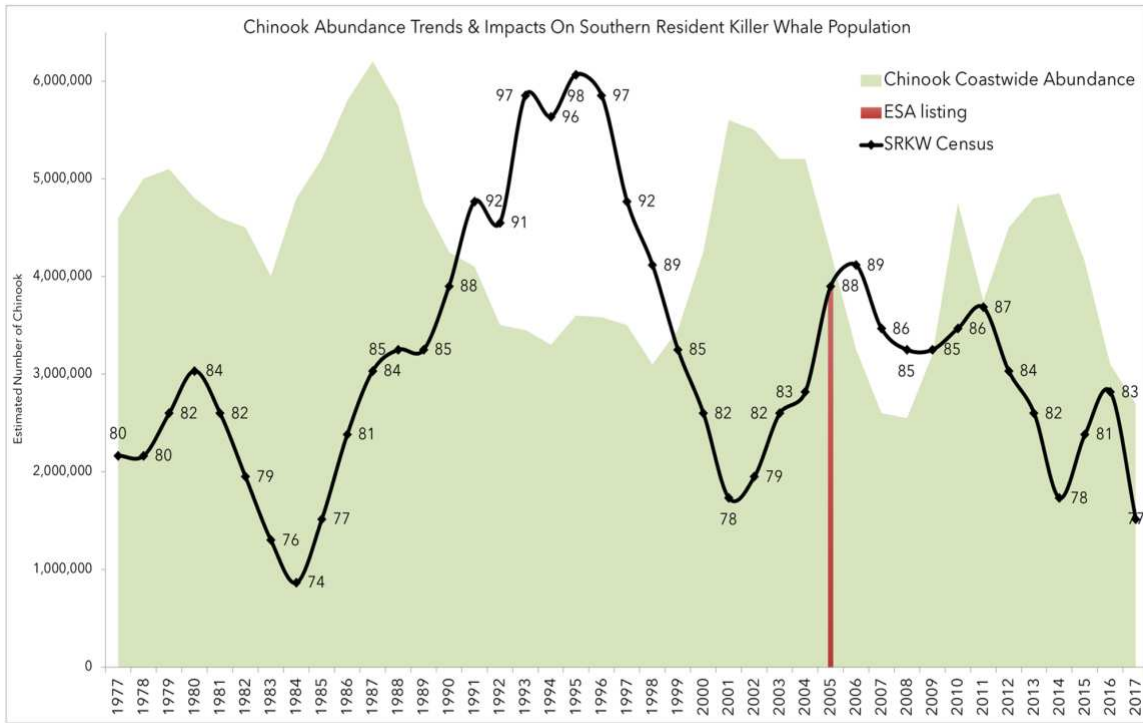


16 6. Like the other fish-eating killer whale populations in the North Pacific, the Southern
 17 Residents are dietary specialists on fish, and particularly Chinook salmon. This diet must support
 18 daily life activities (*e.g.*, foraging, traveling, socializing, resting), in addition to gestation, lactation,
 19 and growth. To maintain this high energy balance, Southern Resident killer whales preferentially
 20 consume older Chinook salmon (>3 years). A recently published NOAA-funded study from 2007-
 21 2014 found the average age ~4.5 years. Chinooks' large size, relatively high fat and energy content,
 22 and year-round occurrence from multiple sources within the Southern Resident killer whales'
 23 range contributes to this preference—and the preference persists despite a steep decline in the
 24 abundance of Chinook salmon. According to the Environmental Protection Agency, “Steep
 25 decline in Chinook salmon is associated with three main factors: habitat change, harvest rates and

1 hatchery influence,” and not insignificantly, damming of rivers below historical spawning sites.

2 7. In 2017, I co-authored an article titled “Population growth is limited by nutritional
3 impacts on pregnancy success in endangered Southern Resident killer whales” in which we
4 discussed the results of our research. As we explained, Southern Resident population growth is
5 constrained by low offspring production for the number of reproductive females in the population.
6 Lack of prey, increased toxins and vessel disturbance have been listed as potential causes of these
7 whales’ decline but partitioning these pressures has been difficult. We validated and applied
8 temporal measures of progesterone and testosterone metabolites to assess occurrence, stage and
9 health of pregnancy from genotyped killer whale feces, collected using detection dogs. Thyroid
10 and glucocorticoid hormone metabolites were measured from these same samples to assess
11 physiological stress. These methods enabled us to assess pregnancy occurrence and failure, as well
12 as how pregnancy success was temporally impacted by nutritional and other stressors, from 2008-
13 2014. Southern Residents have a 17-18-month gestation period and their nutritional health depends
14 on the relative timing of multiple, seasonal and abundant fish runs (e.g., spring Columbia River
15 Chinook and summer Fraser River Chinook), as well as food availability in between those periods,
16 each of which vary markedly between years. The increasingly common occurrence of births
17 outside the typical winter calving period may also be an indication of the increased unpredictability
18 of diminishing Chinook runs, along with the corresponding high rate of late reproductive loss in
19 Southern Residents, including the more costly late spontaneous abortions. Our study concluded
20 that up to 69% of all detectable pregnancies were unsuccessful; of these, up to 33% failed relatively
21 late in gestation, or immediately post-partum, when the cost is especially high.
22
23
24
25

1 Low availability of Chinook salmon appears to be an important stressor among these fish-eating
2 whales as well as a significant cause of late pregnancy failure, including unobserved perinatal loss.
3



5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

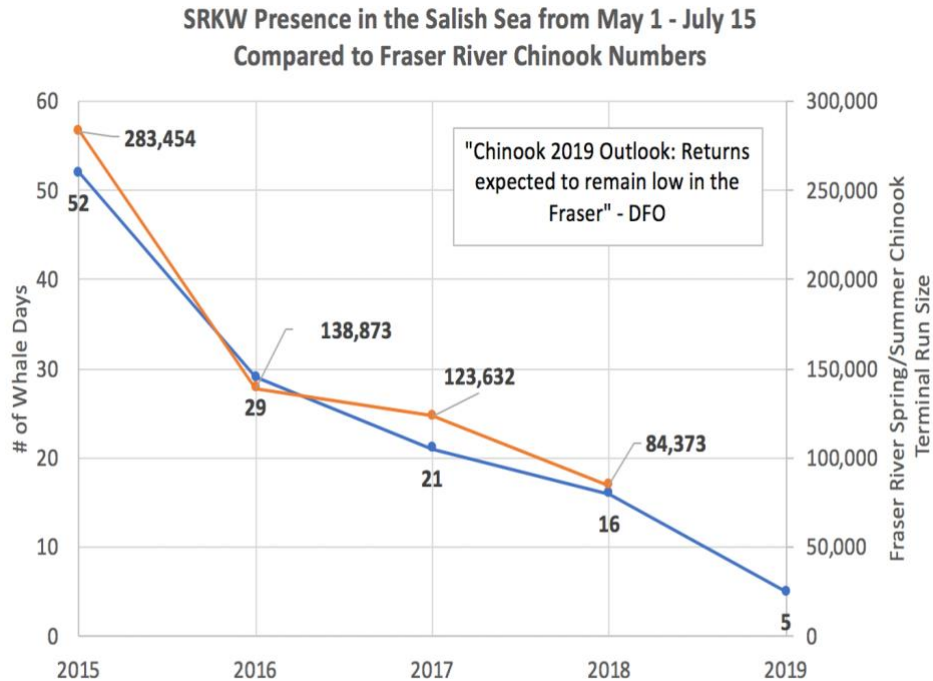
Data Source: Center for Whale Research, NOAA, PFMC, FSC



We concluded the primary solution to drive their population growth is by promoting Chinook salmon recovery. A true and correct copy of this article is attached as Exhibit B to my declaration.

8. The decline in available prey has also led to substantial behavioral changes. The Southern Residents are spending less and less time in the formerly prey-rich Salish Sea, their designated summer core critical habitat, and are being forced to forage further afield, with unknown success, such as in West Coast zones proposed by NMFS as Critical Habitat, but as yet undesignated by NOAA, despite evidence from the Hanson et al, 2021 study confirming the importance of these feeding grounds, and the diversity of Chinook stocks these whales rely on from California Central Valley, to the Columbia Basin.

1 The following graphic shows the correlation between the decline in available Chinook salmon and
2 the days the Southern Residents spent in the Salish Sea during traditional summer hunting periods.



15 Southern Resident Killer Whale presence data from Pacific Whale Watch Association and Orca Network
16 reports. Combined spring/summer Chinook salmon terminal run size for the indicator stocks on the Fraser
17 River from the 2019 Pacific Salmon Commission Joint Chinook Technical Committee Report.
18 Data compiled and graph generated by the Orca Behavior Institute.

19
20
21
22
23
24
25
9. Our research has determined that each Southern Resident killer whale needs around 20 full-bodied Chinook salmon per day to survive. In other words, just to maintain the existing population, over 525,000 fully mature Chinook salmon are needed annually for these whales to survive. To date, fisheries management decisions have not been made with the recovery of the Southern Resident killer whales in mind, fish runs are historically low, and all evidence—including increased death rates, low fecundity, and the physical appearance of the Southern Resident killer whales (see photo below)—indicate that there is a substantial lack of sufficient Chinook available as prey to the Southern Resident killer whales.



Aerial photographs of Southern Resident “J17” over a 3-and-a-half-year period, depicting substantial weight loss and onset of “peanut head,” indicating extreme nutritional distress. She died shortly after this final image, leaving a young calf. Images obtained by Holly Fearnbach (SR3) and John Durban (NOAA Fisheries’ Southwest Fisheries Science Center) using a remotely piloted drone under NMFS Research Permit #19091 (available at <https://crosscut.com/2019/05/orca-j17-starving-death-isnt-inevitable>).

10. Currently, up to 97% of Chinook caught in the Southeast Alaska fishery are fish that originated in BC Canada, Washington, Oregon and Idaho rivers. Under the quotas set by the Pacific Salmon Treaty and approved by NMFS, the amount of Chinook salmon available as prey to the Southern Residents has decreased in real terms, despite the decline in their population size. Given that the Southern Residents are already substantially nutritionally deprived, this additional reduction will further decrease the possibility that this population can successfully reproduce in sufficient numbers to maintain, let alone grow, the population. It is essentially impossible to meet NMFS’ recovery goal of an average growth rate of 2.3% in the Southern Resident killer whale population without increasing the abundance of Chinook available to the Southern Residents as prey.


I am aware that some mitigation measures, such as increased hatchery production, habitat restoration, and developing fish passage structures at dams, may over time help to increase

1 Chinook population available to the Southern Residents. However, these mitigation measures,
2 even if implemented immediately, will have no measurable effect for at least three years, and likely
3 much longer. In the interim, the Southern Resident killer whale population may decline to a point
4 where recovery is impossible due to the limited number of whales capable of reproduction.
5 Moreover, the vagueness of the proposed mitigation measures makes it impossible to assess what,
6 if any, positive impact they would have on the abundance of Chinook available to the Southern
7 Resident killer whales.
8

9 11. There is no question that the Southern Resident killer whales, under existing
10 conditions, are not getting enough food to eat throughout their entire range. Without an increase
11 in the abundance of Chinook, not only will NFMS' population growth goal not be met, but this
12 population will likely go extinct.
13

14 I declare under penalty of perjury under the laws of the United States of America that the
15 foregoing is true and accurate.

16 Executed this 30th day of April 2021.

17
18 

19 Deborah Giles, Ph.D.
20
21
22
23
24
25