

ATTACHMENT E
To the Written Evidence of
Raincoast Conservation Foundation

**Report on
Southern Resident Killer Whales**

Prepared for Raincoast Conservation Foundation

By Dr. Deborah Giles

December 5, 2018

Expert Report of Dr. Deborah Giles

Date October 4, 2018

Describe your qualifications

1. Please describe your education and your professional and academic credentials. Please also provide your current *curriculum vitae*.

I am a killer whale biologist. I have a PhD in Geography with an emphasis in biogeography and conservation biology from the University of California, Davis. My Master's thesis and PhD dissertation examined killer whale behavioral changes in response to human variables such as vessel quantity, distance and activity.

I have conducted research on the Southern Resident Killer Whales since 2005, and my research is described in detail in my CV.

2. What is your current position?

I am a resident scientist and lecturer at the University of Washington's Friday Harbor Laboratories and I recently became the Science and Research Director for a Washington State based non-profit called Wild Orca which seeks to fund ongoing research as well as provide education and outreach by translating science about killer whales to the general public.

On a volunteer basis, I am a scientific advisor and a coordinator for the Orca Salmon Alliance, a network of non-profit organizations that works to educate the public about threats facing the Southern Resident Killer Whales and the salmon species they rely on and to act to eliminate those threats.

I am also an invited delegate on both the prey and vessel working groups related to the Southern Resident Killer Whale Task Force established in March 2018 by the Governor of Washington State.

3. Please describe your current and past killer whale research, particularly with respect to Southern Resident Killer Whales.

My research focuses on Southern Resident Killer Whales, and my involvement in field research includes a project with the University of Washington's Center for Conservation Biology, using samples of Southern Resident killer whale scat to monitor the whales' physiological health. I am also participating in a three-year project with the National Oceanic and Atmospheric Administration (NOAA) using suction cup tags called Dtags that document underwater whale movements as well as the acoustic environment near the tagged whale.

My Master's and PhD degrees were focused on whale behavior and vessel interactions.

Southern Resident Killer Whale population size

4. Please confirm how many individuals are currently in the Southern Resident Killer Whale population, and the basis for your knowledge.

As per the official census provided by the federally contracted Center for Whale Research based in Friday Harbor Washington, there are currently **74 wild living** Southern Resident killer whales and one living in captivity in Miami Florida.

5. How many individuals has the population lost in 2018? Please specify which individuals were lost and when.

Three Southern Resident Killer whales died in 2018. L92 (Crewser), a 23-year old male, was declared missing in June, a new born calf born to J35 (Tahlequah) died the same day she was born, July 24th, and calf nearly four years old, J50 (Scarlet) was declared dead September 13, 2018.

Observations of Southern Resident Killer Whales in summer 2018

6. When did the Southern Residents return to the Salish Sea this year?

The Southern Residents were absent from inland waters (the Salish Sea, surrounding the San Juan Islands and Gulf Islands) for the entirety of May 2018, which has never been observed in the years since researcher Michael Bigg began documenting this population.

7. Please describe your observations of Southern Resident Killer Whale J35 this summer, and particularly between approximately July 24 and August 11.

I am frequently on the water in the vicinity of Southern Resident killer whales because I collect fecal samples for research. We analyze them for stress, pregnancy, and nutrition hormones, in addition to other information.

I was on the water on the morning of July 24 but came off the water at 12:30 to travel to a meeting in Olympia, Washington of the Southern Resident Killer Whale Task Force. I was informed by multiple colleagues via radio while still on the water that J35 was carrying a dead neonate (or, newborn calf). This was confirmed later that day, by the Center for Whale Research, which conducts the annual census of the population and confirms births and deaths. It is established within the research community that the Center for Whale Research confirms births and deaths and documents the population with photographs. I returned from Olympia on July 25 and was back on the water on July 26, which is when I began to observe J35 with the dead calf.

I am only able to make personal observations of the Southern Residents when they are in inland waters. Between July 26 and August 11, J35 travelled in and out of inland waters, and I observed J35 most days that she was in inland waters. During this time I was trying to take fecal samples from the Southern Resident for research, but also trying to give J35 space. She was carrying the dead calf throughout this time.

While she was carrying the dead calf, J35 was often swimming alone, and sometimes within closer proximity to her family (her mother and siblings and offspring). She was within calling range of her family, and often within calling range of other members of J-Pod, during this time.

J35 had to drop the calf sometimes to take a breath when it was draped over her blowhole. She would take a series of breaths to get oxygen, and then dive to collect the sinking calf.

Killer whales are highly intelligent and have social bonds. They have a brain structure that has the capacity for emotion, and J35 appeared to be experiencing grief and mourning her calf.

8. Have you previously observed this behaviour in other killer whales?

This behavior is not a commonly documented occurrence in killer whales. When this behaviour is observed in killer whales it usually happens only on the first day after the calf dies. In 2010 I observed another Southern Resident, L72, carry a dead calf for many hours but by the next day she was not carrying her calf any longer. I am not aware of any other killer whale doing this for more than 24 hours.

It caught people's attention and I got calls from local and international media. I did approximately 40 interviews on this subject with local, Canadian and international media.

9. Please describe your observations of Southern Resident Killer Whale J50 this summer and your involvement in efforts to assist her.

My answers are based on my direct observations and on my involvement in the response team for J50. The response team was led by senior members of NOAA management, research and communications. Members included, but were not limited to: Teri Rowles, Kristin Wilkinson, Lynne Barre, Ruth Howell, Michael Milstein, Justin Viezbicke, Sarah Wilkin, James Hackett, Brad Hanson, John Durban, Candice Emmons. Canada's Department of Fisheries and Oceans employees or affiliates including: Sheila Thornton, Paul Cottrell, Stephen Raverty, Andrew Thomson. Russ Mullins from WA Department of Fish and Wildlife, Jeff and Katy Foster, Lori Marino, Ingrid Visser, and Charles Vinick from the Whale Sanctuary Project, Whale Museum staff Jenny Atkinson, Taylor Shedd, and Jennifer Olson. And there were several current or former SeaWorld employees involved including: Hendrik Nollens, Greg Busch, Eric Otjen, Jon Paterson, and Jim McBain as well as Marty Haulena from the Vancouver Aquarium

J50 was born in December 2014 but when she died she was closer to the size of a one-year-old. I observed that she became thinner throughout the summer.

I was on the water with the matriline consisting of J16 and her offspring, which includes J50, in mid July (I believe July 13th), and my team smelled J50's breath. It smelled remarkably bad. It reminded me of what I observed when another Southern Resident, J1, was dying. J50's breath on that day was not as bad as what I observed with J1, but it was bad. I contacted Brad Hansen of NOAA, whose research vessel I had been on when I observed J1, to tell him about J50. He quickly assembled a team and brought equipment for breath analysis to San Juan Island, and I took him out on my boat on July 21st to get a breath sample.

I participated in a phone call about J50 on August 6th with all of the researchers that are on the water up here including researchers from NOAA, Center for Whale Research, The Whale Museum, in addition to Sheila Thornton and Paul Cottrell of DFO and the people from NOAA who are responsible for getting research permits. Things moved quickly from there. An hour and a half after that call we collectively decided to put together a team and get biological samples as soon as possible. This meant my team trying to get a fecal sample, Brad Hansen's team getting a breath analysis, and, from the veterinary perspective, team members getting a visual and behavioural assessment. Since this initial meeting, the response team continued to be dynamic, responding to changing situations, and staying in good contact about the state of J50.

I spent 15 minutes on the water near J50 the evening of Wednesday August 1 and I could see the outline of her skull, and her ribs. In a healthy whale, bones are not visible. I have never seen such a thin killer whale still alive.

The J50 response team had conference calls on days when J50 is sighted. On one of the calls I learned that NOAA and DFO both granted permits for antibiotics to be administered to J50. I was away at a Task Force meeting on August 9 but I was informed on a call with the team that, on August 9, veterinarians on the team including Dr. Marty Haulena from the Vancouver Aquarium, accompanied by NOAA employees deployed a dart to administer the antibiotics. We discussed on the J50 response team telephone calls that the plan was to continue to try to collect biological samples and also administer another dose of antibiotics, as well as a de-wormer shot, due to the team's theory that J50 might have parasites.

I learned on one of the J50 response team phone meetings that the Lummi Nation, in collaboration with NOAA, made an attempt to feed J50 Chinook salmon on August 12th. It is not believed that she took any of the fish. The J50 response team also discussed attempting to feed her with Chinook that have medication added to them, as another way of providing her with medication.

Our research team collected a fecal sample on August 18th from behind several members of Jpod. We turned over a portion of the sample to Dr. Joe Gaydos and genetic testing on that portion of the samples determined the sample did not belong to J50.

On September 3rd, while working from our research vessel, Dr. Haulena administered another partial dose of antibiotics shot and it is thought that J50 got a little more than half a dose.

At the time of J50's death, the general plan was to continue to monitor her for declines or improvements in health and to attempt to administer a de-wormer to get rid of parasites, then possibly to attempt to feed her again. The Southern Residents sometimes have worms, and I have collected them in fecal samples before. This is not always a problem for a whale, but we were concerned about worms in J50's case because her condition is already compromised.

During the time that the J50 response team was active, DFO had a research crew on the water. They observed the Southern Residents in the area west of Sooke, including the west entrance of the Strait of Juan de Fuca and up the west coast of Vancouver Island, and the American members of the team were handling the area east of Sooke. The veterinarians on the team who were involved in administering shots include Dr. Gary Gaydos of the Sea Doc Society and Dr. Marty Haulena of the Vancouver Aquarium, and while the conditions are generally more favourable for deploying shots in U.S. water, all partners including from DFO were involved in documentation and information-sharing.

I encouraged NOAA to hold a town hall meeting so that members of the public could get more information about J50, these meeting occurred just as the Center for Whale Research announced that J50 was presumed dead.

Leading up to her death, plans were being discussed as to what should be done to treat J50 should she live strand or in the event that she was clearly left behind by her family. Those discussions were not completed as J50 died before any additional actions needed to be taken.

I last saw J50 September 7th and to my knowledge she was last photographed (and last seen) at dusk on Saturday September 8th near the coal docks in BC Canada, near the Tsawwassen ferry terminal by a whale watching company captain. NOAA continued actively searching for her by air and on the water until September 14. I was not directly involved with those efforts although everyone on the water was on lookout for her body for days afterward.

10. Is there any precedent for the effort to assist J50?

I, and other researchers, do research and collect samples on an ongoing basis, but the efforts to provide her with medication in the wild and to feed her in the wild were unprecedented.

Do you have any relationship with a party to this litigation that might affect your duty to be objective and impartial?

11. Before agreeing to give an expert report in this court case, did you have a relationship with the Government of Canada? For example, are you retained to do work for the Canadian Ministry of Fisheries and Oceans?

No.

12. Before agreeing to give an expert report in this court case, did you have a relationship with any of the Applicants (David Suzuki Foundation, Georgia Strait Alliance, Natural Resources Defense Council, Raincoast Conservation Foundation and WWF-Canada) or their employees that might affect your duty to be objective and impartial? Please explain.

I am familiar with Rachael Merrett of Georgia Strait Alliance and have communicated with her a few times over the years on social media related to whale watching observations or the whales. I saw her most recently in person (perhaps the only time I have met her in person) at the orca symposium in Vancouver last fall. We are friends on Facebook.

I know Misty MacDuffee of Raincoast Conservation Foundation mostly from telephone conversations I have over the years about salmon and the Southern Resident killer whales. I saw her at the orca symposium hosted by the Canadian government at the end of last year. A few years ago Misty was invited by my colleague Cindy Hanson to come to give a talk on salmon at a local workshop CALF – community action look forward – that I help co-coordinate.

Earlier this year Misty contacted me concerning a petition the Applicants had prepared to ask if I would write a letter in support of it. I wrote a letter in February to the Canadian Minister of Fisheries and Oceans and Minister of Environment at the Applicants' request. My letter explained the urgency of management actions for the Southern Residents and supporting the Applicants' petition to the Ministers that called for immediate actions to address key threats to the Southern Residents. I also offered my help in any way necessary to aid in the recovery of the Southern Residents.

I do not feel that this interferes with my ability to be objective or impartial in this report about the status of the Southern Resident population and recent events affecting the population.

I have known Giulia Good-Stefani the most through our work with the Orca Salmon Alliance. We are often on the same conference calls and meetings related to the Southern Resident killer whales. She once stayed with me at my home on San Juan Island when she here to give a talk at one of the CALF workshops, which is held annually.

Deborah A. Giles, Ph.D
P.O. Box 3364 • Friday Harbor WA 98250
(360) 378-0353 • (916) 531-1516 (cell)
Email: giles7@gmail.com

STATEMENT OF PERSONAL INTEREST

As a killer whale biologist based on San Juan Island since 2005 I apply my scientific expertise, educational training, and diverse community outreach to elevate awareness of the threats facing the Salish Sea Ecosystem. I do this by furthering partnerships with county, state and federal agencies, as well as non-governmental organizations and universities to ensure they have the most up-to-date information to support the recovery of our endangered salmon, whales and the Salish Sea Ecosystem.

EDUCATION

University of California, Davis

- 2014 Ph.D. Biogeography, Conservation Biology
- 2007 M.A. Conservation Biology
- 2004 B.A. Philosophy, minor in Nature and Culture

COMMUNITY ENGAGEMENT & OUTREACH ACTIVITIES

- **Washington State Governor appointee to the Prey and Vessel Working Groups supporting the Southern Resident Killer Whale Recovery Task Force.** Work with other invited members of the legislature, Government of Canada and representatives from tribal, federal, local and other state governments, the private and non-profit sectors using to best available science to identify, research and analyze potential actions and formulate recommendations for Task Force consideration.
- **Co-organizer and sponsor of ongoing Southern Resident killer whale CALF (Community Action – Look Forward) workshop series.** The fifth and most recent workshop was held in October 2017 and featured topics and discussion on how to apply lessons learned from the Yellowstone ecosystem to the Salish Sea Ecosystem, about the complex issues involving the Pacific Salmon Treaty, federal law and state management of fisheries and about how individuals can be involved in recovery efforts for the Southern Resident fish-eating whales and the Chinook salmon they rely on.
- **Coordinator for Center for Whale Research’s “Research – Action – Recovery” Symposium and Fundraiser Auction,** attended by 200+ local and off-island killer whale advocates. Discussion topics included an update on SRKW demographics, current and future studies, threats preventing the orcas from recovering, and the importance of policy and advocacy to help the endangered whales.
- **Science Advisor for the Orca Salmon Alliance (OSA)** which is comprised of international, national, regional, and local non-profit organizations, researchers, and community action groups working to educate the public about the threats facing the Southern Resident orcas the salmon species they rely on and to act to eliminate those threats.
- **Coordinator for OSA sponsored event “Intertwined Fates: The Orca-Salmon Connection” at the Seattle Aquarium October 2015.** Keynote speaker Carl Safina.
 - On new research confirming the important connection between SRKWs Chinook.
 - That the prospects for SRKW survival dims without significant restoration of Chinook runs across SRKW range including the Columbia, Klamath, and Sacramento Rivers in the U.S. and the Fraser River in Canada.

- **Established San Juan Island Naturalist Program** – a land-based naturalist led whale watching and natural history program conducted at the Land Bank’s Westside Preserve. A joint program with San Juan Island Land Bank, Salish Sea Ecosystem Advocates, Orca Network, and Whale Scout.
- **Science Advisor - Killer Whale Tales; Science Education** – assist in conducting hands-on education modules at Lime Kiln State Park with all 4th grade classes from the Bellingham School District (May-June 2015-2017).

GRANTS AND AWARDS

- NOAA/NMFS Research Contract to record whale and vessel location in conjunction with Cascadia Research Collective examining diving behavior, foraging ecology and movements of killer whales. 2010-2014
- Geosystems Award, California Geographical Society Annual Meeting’s Top Award. 2012
- Society of Marine Mammalogy, Student Travel Award, for Biennial Conference on the Biology of Marine Mammals, Tampa, FL. 2011
- NOAA/NMFS Research Contract to study vessel compliance with boating regulations 2009
- NOAA/NMFS Research Contract to study effects of vessels on killer whale behavior 2007-2009
- Office of Graduate Studies, Travel Award, presentation at AAG annual conference 2007
- Recipient of a Henry A. Jastro/Peter J. Shields Research Fellowship Award-3 years 2006-2008
- UC Davis Geography Grad. Group Research Grant: Student Support Award-6 years 2005-2011

PROFESSIONAL EXPERIENCE

Wild Orca – Science and Research Director, May 2018 – present.

- Develop and facilitate research projects focused on Southern Resident Killer Whales. Organize education and outreach opportunities to engage the public in salmon and killer whale conservation efforts. Conduct interviews with media.

Orca Network – Scientific Advisor, Nov. 2015 – present.

- Provide scientific interpretation and consultation and present the latest findings at research workshops and symposiums. Engage the public at community events.

San Juan Island Naturalist Program (SJINP) – Senior Coordinator, May 2015 – present

- Facilitate annual memorandum of understanding between partners, San Juan County Land Bank, Orca Network, Whale Scout, with program support from additional non-profit organizations.
- Train seasonal coordinator, certified naturalists, and multiple volunteers on the natural history of the Salish Sea and basic biology of marine mammals. Train all on data collection protocols.
- Ensure data collected by SJINP is accurately entered into database
- Oversee annual summary statistics report to San Juan County Land Bank

Center for Whale Research (CWR) – Research Director & Projects Manager, Nov. 2015 – Oct. 2017

- Collaborated with state and federal partners, NGOs and whale and salmon advocacy organizations to protect and recover the whales.
- Procured and administered grants related to the health of the Southern Resident killer whales.
- Developed grant proposals to undertake additional research on acoustics and behavior of cetaceans in the Salish Sea, along the Pacific Coast to Monterey, California, in Alaska, and Hawaii.
- Managed staff, accounting, vessel maintenance scheduling, and drove research vessels as needed.
- Presented data and gave lectures at local, state, federal and NGO sponsored workshops
- Served as primary media contact interpreting latest scientific research and as the “voice” for whales, conducted numerous interviews for print, digital and video, authored press releases.
- Facilitated annual photo ID and demography on endangered Southern Resident killer whales.

Graduate Researcher: Master's thesis and PhD dissertation research, 2006-2013

- Wrote research grant proposal and successfully completed contract obligations including administration of \$89,730.00 budget.
- Procured U.S. scientific research permits under the Endangered Species Act/Marine Mammal Protection Act and Canadian research permits under the Marine Mammal/Species at Risk Act.
- Assessed vessel compliance with guidelines and laws governing boating around marine mammals.
- Collected location and attribute data on killer whale behavior, and vessel location, density and distance from whales to assess change in killer whale behavior in the presence of vessels.

Research Scientist: (NOAA/NMFS) National Oceanic and Atmospheric, 2010-2014 and 2018-2020 Administration/National Marine Fisheries Service Research

- Utilized specialized equipment to capture remote whale and vessel location data and attribute data to be used in conjunction with Cascadia Research Collective and the Northwest Fisheries Science Center to assess underwater acoustics recorded by a suction-cup tag attached to the focal killer whales. Future peer reviewed publications stemming from the project will also examine killer whale diving behavior, movement patterns and foraging ecology.

Research Vessel Captain: Center for Conservation Biology, University of Washington, 2009-present Research: Physiological monitoring of Southern Resident Killer Whales (*Orcinus orca*)

- Captained research vessel for scat detection dog to locate and collect killer whale fecal samples used to assess stress and nutrition hormone levels and toxicant loads.
- Conduct killer whale behavioral research.
- Responsible for crew safety training and vessel maintenance.

Research Assistant: Cascadia Research Collective, 2005-2010

Research: Focal Behavioral Observations of Fish-Eating Killer Whales: Improving Our Understanding of Foraging Behavior and Prey Selection.

- Assisted with spotting, identifying, and tracking whales.
- Retrieved field samples from nets, incl. fish scales and prey tissue, processed samples for analysis.

Research Assistant: The Whale Museum's Soundwatch Boater Education Program, 2005-2008

- Captained vessel conducting patrols to educate boaters on best practices around marine wildlife.
- Collected data on vessels quantities and activities around whales, including commercial and private vessel compliance with recognized guidelines and laws on best boating practices.

Research Assistant: The Whale Museum's Marine Mammal Stranding Network, 2005-2014

- Responded to alert calls and assisted with assessing condition of potentially stranded marine mammals.
- Collected remains for necropsy at University of Washington Friday Harbor Labs.

Research Assistant: The Northeast Minke Whale Project, 2005-2007

- Participated in on-the-water surveys for minke whales in the Northeast Pacific.

Research Scientist: (NOAA/NMFS) National Oceanic and Atmospheric Administration/National, 2007 Marine Fisheries Service Research Cruise – Southern Resident Killer Whale Winter Range Tracking.

- Deployed, retrieved and monitored acoustic recording equipment designed to document marine mammal vocalizations.
- Operated hydraulic arm to deploy and recover CTD (conductivity, temperature, depth) equipment.
- Processed water samples for salinity, nutrients, and toxins. Conducted and processed samples from plankton tows.

- Utilized high-powered military binoculars to locate marine mammals, recorded sightings in customized computer database.

Research Assistant: University of Washington, 2005-2006

Research: Effects of Vessels on Behavior of Southern Resident Killer Whales.

- Operated computer in team effort with theodolite operator, assisted with spotting, identifying, and tracking individual killer whales from land-based field sites.

Biological Science Technician, GS-404-05: NOAA/National Marine Fisheries Service/NWFSC, 2006

Research: Behavior of Southern Resident Killer Whales in the Presence of Vessels in San Juan Islands

- Collected vessel density and attribute data using a handheld Palm Pilot computer.
- Located and identified individual killer whales, monitored whale movements, and identified group social behaviors.

Research Assistant: Cascadia Research Collective, 2005

Research: Trends in Contaminants in Puget Sound harbor seals

- Recorded field data, photographed deceased harbor seal pups, bagged and labeled biopsy specimens including blubber and liver tissue for later lab analysis of toxicity levels.

SPECIAL TRAINING

- Experience with GIS, database management and mapping
- 13 years' experience operating vessels around all marine mammals in the Salish Sea. At ease on large and small research vessels regardless of weather conditions.
- Motorboat Operator Certification.
- Certified in Standard first aid, Adult CPR/AED, Infant and Child CPR.
- Thoroughly trained in Global Positioning Systems (GPS) hardware and software technology, and in the use of commonly utilized field equipment including total stations, laser rangefinders, binoculars, digital compasses, and various data collectors including: Pocket PCs, Palm Pilots.
- Extensive experience in marine mammal research such as identifying, collecting and recording data on individual Southern Resident Killer Whales, minke, humpback and gray whales, harbor seals, harbor and Dall's porpoises.
- Proficient in acoustic tag insertion in salmon smolt.
- Skilled in recording vessel quantities and activities around marine mammals & marine protected areas.

TEACHING EXPERIENCE

- University of Washington, Friday Harbor Labs. Instructor
Marine Biology, lecture and lab 2017
- UW-FHL Instructor
Marine Mammals of the Salish Sea, lecture and lab 2017, 2018
- University of California, Davis (UCD). Instructor
Habitat Conservation and Restoration, lecture and field lab
Wildlife, Fisheries, Conservation Biology Department (WFCB) 2014,2015
- UCD Teaching Assistant (TA) – Habitat Conservation & Restoration, WFCB 2006-2013
- TA – Wildlife Ecology and Conservation, WFCB 2011-2013
- TA – Natural History of California's Wild Vertebrates, WFCB 2011-2013
- TA – Coastal Ecosystems, WFCB 2010
- TA – War & Terrorism, Science and Society 2009
- Graduate Student Researcher, Coastal Ecosystems Analysis – Pt. Reyes CA. 2005, 2008
- TA – Technology in Society, American Studies 2008
- TA – Plant Geography, WFCB 2006
- TA – Physical Geography, Environmental Science and Policy 2006

- TA – Nature and Culture in America, American Studies 2005
- TA – Human Evolutionary Biology, Anthropology 2004

ACADEMIC & COMMUNITY SERVICE

- Elected to the Steering Committee for the Salish Sea Ecosystem Advocates 2009-present
- Scientific Advisor for Killer Whale Tales,
Elementary school environmental education program 2008-present
- Admissions Committee, Geography Graduate Group 2006-07 applicant pool 2006
- Executive Committee, Geography Graduate Group, Student Representative 2004-2007
- U.C. Davis Graduate Students Association, Graduate Group Representative 2004-2007

PUBLICATIONS

- S. Ellis, D. W. Franks, S. Natrass, T.E. Currie, M. A. Cant, **D.A. Giles**, K. C. Balcomb, D. P. Croft, 2018. Analysis of ovarian activity reveal repeated evolution of post-reproductive lifespans in toothed whales. *Scientific Reports* 8, No. 12833
- Lundin, Jessica I., Lundin, Gina M. Ylitalo, **Deborah A. Giles**, et al., 2018. Pre-oil spill baseline profiling for contaminants in Southern Resident killer whale fecal samples indicated possible exposure to vessel exhaust. *Marine Pollution Bulletin* 136 (448–453)
- S. Ellis, D. W. Franks, S. Natrass, M. A. Cant, D.L. Bradley, **D.A. Giles**, K. C. Balcomb, D. P. Croft, 2018. Post-reproductive lifespans are rare in mammals. *Ecology and Evolution* Vol. 8, (5)
- S. Ellis, D. W. Franks, S. Natrass, M. A. Cant, M. N. Weiss, **D. Giles**, K. C. Balcomb, D. P. Croft, 2017. Mortality risk and social network position in resident killer whales: sex differences and the importance of resource abundance. *Proc. R. Soc. B* 2017 284 20171313; DOI: 10.1098/rspb.2017.1313.
- Lacy, Robert C., Rob Williams, Erin Ashe, Kenneth C. Balcomb, Lauren J.N. Brent, Christopher W. Clark, Darren P. Croft, **Deborah A. Giles**, Misty McDuffee, Paul Paquet, 2017. Evaluating anthropogenic threats to endangered killer whales to inform effective recovery plans. *Scientific Reports* 7, Article number: 14119
- Wasser, SK, Jessica Lundin, Katherine Ayres, Elizabeth Seely, **Deborah Giles** et al., 2017. Population growth is limited by nutritional impacts n pregnancy success in endangered Southern Resident Killer Whales. *PLoS ONE* 12(6)
- Lundin, J., et al., 2016. Modulation in Persistent Organic Pollutant Concentration and Profile by Prey Availability and Reproductive Status in Southern Resident Killer Whale Scat Samples. *Environ. Sci. Technol.*, 2016, 50 (12)
- Houghton, J., Marla Holt & **Deborah Giles**, 2015. The relationship between vessel traffic and noise levels received by killer whales (*Orcinus orca*). *PLoS ONE* 10(12)
- **Giles, D.A.**, and Kari Koski, 2012. From Voluntary Guidelines to Regulations: the Evolution of Adaptive Management Practices for Vessel-based Whale Watching in the Trans-Boundary Waters of British Columbia and Washington State. *Journal of International Wildlife Law and Policy*, 15(1)
- **Giles, Deborah A.**, Rose Cendak, and Kari Koski, 2010. Measuring vessel compliance with Washington State boating laws and regional “Be Whale Wise Boating Guidelines” in the presence of Southern Resident Killer Whales (2007–2009). NMFS Contract Report No. AB133F07SE3026
- **Giles, Deborah A.** and Rose Cendak, 2009. An Assessment of Vessel Effects on the Spatial Structure of Southern Resident Killer Whale groups and Measuring Vessel Compliance with Boating Guidelines. NMFS Contract Report No. AB133F07SE3026

- Bunting, J.E., D.A. Giles, et al., 2011. A Primer of Conservation Behavior. Book Review Animal Behaviour, Volume 81, Issue 1, pages 353-355

INVITED LECTURER / PARTICIPANT

- International Society for Anthrozoology (ISAZ) - UC Davis Veterinary Medicine, Plenary speaker: *A decade post listing - reassessing identified threats to the federally listed "endangered" Southern Resident Killer Whales.* 2017
- Orca Network's Ways of Whales Workshop, *State of the science on endangered Southern Resident killer whales* 2016
- Salish Sea Conference, Vancouver British Columbia, Canada. *Phocoenacide: the killing of porpoise by fish eating killer whales* 2016
- The Whale Museum's Naturalists Training Gear-Down, invited speaker. 2015
- American Cetacean Society Biennial Conference, invited speaker, San Diego CA 2012
- California Geographical Society Annual Conference, Davis CA 2012
Using non-invasive remote sensing equipment and GIS to assess potential effects of vessels on Southern Resident killer whale behavior in the Salish Sea
- Salish Sea Conference, Vancouver British Columbia, Canada. 2011
Science and Management of Killer Whales: Using non-invasive remote sensing equipment and GIS to assess potential effects of vessels on Southern Resident Killer Whales
- Society of Marine Mammalogy, Biennial Conference on the Biology of Marine Mammals 2011
Using non-invasive remote sensing equipment and GIS to assess potential effects of vessels on Southern Resident killer whales in the Salish Sea
- Association of American Geographers 2011
Studying an Endangered Species: Southern Resident Killer Whales
- Invited participant, Department of Fisheries and Oceans, Canada 2011
Northern and Southern Resident Killer Whales – Disturbance Technical Workshop
- Graduate Seminar in Geography Seminar - Geography Matters 2010
The Biogeography of Killer Whales in the Salish Sea, and the Novel Research Techniques Being Used to Recover the Endangered Species
- Introduction to Conservation Biology, UC Davis 2009
Topics in Marine Conservation using killer whales as indicator species for ecosystem health
- Southern Resident Killer Whale Transboundary Naturalists Workshop 2009
 - 1) *Assessing Changes in Killer Whale Group Cohesion and Activity State as Variables Such as Bathymetry, Time of Day, Currents, Tides, Season, and Number, Distance and Activity of Vessels Change*
 - 2) *Bioenergetic Impacts of Vessel Presence in Southern Resident Killer Whales Presented for Dr. Dawn Noren*
- Habitat Conservation and Restoration, UC Davis 2009-2013
Habitat use and partitioning by sympatric killer whale sub-species in Washington State
- The Whale Museum: Lecture Series 2008
Behavior of Southern Resident Killer Whales in the presence of vessels in the Salish Sea
- Wildlife Ecology and Conservation –UC Davis 2008-2012
Habitat and Niche: using Southern Resident killer whales to examine how these may change with seasons
- Conservation Biology, UC Davis 2008-2012
Assessing Potential Impacts of vessels on Southern Resident Killer Whales: Implication for future regulatory guidelines
- The Whale Museum: Lecture Series 2007
Biogeographic study of Southern Resident Killer Whale Behavior throughout their summer range in the Salish Sea
- Association of American Geographers, Annual Meeting – San Francisco 2007

- Student Paper Presentation - 2006 pilot study for dissertation research*
- Interdisciplinary Graduate Symposium 2007
Presentation - pilot study hypothesis and methods
 - Animals in Society – Population Health and Reproduction/School of Vet Med. 2007-2014
Impacts of vessels on Southern Resident Killer Whales: Implication for future regulatory guidelines

AFFILIATIONS

- American Society for Mammalogists
- Animal Behavior Society
- Association of American Geographers
- Association of Pacific Coast Geographers
- California Geographical Society
- Salish Sea Ecosystem Advocates
- Society for Marine Mammalogy
- The Wildlife Society

REFERENCES

San Juan County

- **Dr. Billie Swalla, Director**
University of Washington - Friday Harbor Laboratories
620 University Road, Friday Harbor 98250
(206) 616-0764 • Email: bjswalla@uw.edu
- **Dr. Joseph K. Gaydos, Science Director**
SeaDoc Society
942 Deer Harbor Rd.
Eastsound, Washington 98245
(360) 376-3910 • Email: jkgaydos@ucdavis.edu
- **Doug McCutchen, Preserve Steward**
San Juan County Land Bank
50 Court Street, No. 6, Friday Harbor, WA 98250
360-378-4402 • Email: dougmc@sjclandbank.org

Regional

- **Lynne Barre, Branch Chief Protected Resources Division**
National Oceanic and Atmospheric Administration (NOAA)
Northwest Fisheries Science Center
7600 Sand Point Way Northeast, Seattle, WA 98115
206-526-4745 • Email: lynne.barre@noaa.gov
- **Fred Felleman, Port of Seattle Commissioner**
Friends of the Earth Northwest Consultant
2711 Alaskan Way, Seattle, WA 98121
206-595-3825 • Email: felleman@comcast.net
- **Dr. Samuel Wasser, Director, Center for Conservation Biology**
University of Washington - Department of Biology
232 Johnson Hall, Seattle, Washington 98195
206-543-1669 • Email: wassers@uw.edu