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## **Order of Appearances**

### **Living Oceans Society/Raincoast Conservation Foundation Panel**

Ms. Katie Terhune	Ms. Misty MacDuffee	Mr. Andrew Rosenberger
Mr. Brian Falconer	Mr. Paul Paquet	Mr. Michael Jasny
Ms. Caroline Fox		

Introduction by Mr. Tim Leadem for Living Oceans & Raincoast 14211

Examination by Ms. Laura Estep for Northern Gateway Pipelines 14468

Re-examination by Mr. Leadem 15623

### **Introduction by Mr. Tim Leadem for Living Oceans & Raincoast 14211**

Mr. Leadem introduced the witness panel for Living Oceans Society and the Raincoast Conservation Foundation. With the exception of Ms. Katie Terhune, all of them were involved in the preparation of evidence submitted by the Raincoast Conservation Foundation, specifically [Exhibits D170-2](#), parts 02 to 22, as well as certain of the information responses (IRs) in [Exhibit D170-3-02](#).

Dr. Paul Paquet supervised all parts of the Raincoast Conservation Foundation submission. His CV is [Exhibit D170-2-04](#). 14212

Mr. Michael Jasny was responsible for the submission of the National Resources Defense Council regarding Underwater Noise Impacts from Northern Gateway Tanker Traffic [[Exhibit D170-2-13](#)]. His CV is [Exhibit D66-22-10](#). 14213

Ms. Caroline Fox's prepared Part 3 of the Written Evidence of the Raincoast Conservation Foundation entitled "Marine Impacts - Marine Birds" [[Exhibit D170-2-14](#)], and Part 5, "Marine Impacts - Herring" [[Exhibit D170-2-18](#)]. Her CV is [Exhibit D66-22-4](#). 14276

Mr. Andrew Rosenberger assisted in the preparation of "Marine Impacts - Marine Mammals" and "Tanker Risks". His CV is [Exhibit D66-22-02](#). 14317

Ms. Misty MacDuffee assisted in the preparation of a number of reports in the Raincoast Conservation Foundation submission, including "Marine Impacts - Marine Mammals," "Maine Impacts Salmonids," "Tanker Risks" and "What's at Stake: The Cost of Oil on British Columbia's Priceless Coast." She also is representing "Predictive Marine Modeling for Queen Charlotte Basin, British Columbia", prepared by Dr. Patrick Halpin and Ben Best at Duke University. Her CV is [Exhibit D66-22-11](#). 14342

Ms. Katy Terhune is a contractor to the Living Oceans Society. She prepared or is responsible for a number of reports listed in the transcript. Her CV is [Exhibit D66-22-8](#). 14374

Mr. Brian Falconer contributed to "Tanker Risks" for the Raincoast Conservation Foundation. His CV is [Exhibit D66-22-3](#). 14427

### **Examination by Ms. Laura Estep for Northern Gateway Pipelines 14468**

Ms. Estep asked about Raincoast Conservation Foundations's (Raincoast), [marine mammal evidence](#), seeking to understand who authored which parts of it, and who was involved in the marine mammal surveys. She asked the witnesses about their previous experiences with marine mammal research. Discussion continued around general details of Raincoast's publication, "What's at Stake" (from the same exhibit). 14480

#### **Target audience and mission of Raincoasts' reports**

Dr. Paquet explained the report is a *popular* report, not peer-reviewed or intended for a scientific audience, and agreed that it is intended for a different audience than Raincoast's 2009 technical report, "Predictive Marine Mammal Modelling for Queen Charlotte Basin, British Columbia". 14607

Noting part of Raincoast's mission to be *informed advocacy*, Ms. Estep asked if the "What's at Stake" publication is an example of that. Dr. Paquet agreed that it is. She asked if the publication is a public relations tool, to which Dr. Paquet disagreed, calling it an informative and educational tool. 14613

Ms. Estep asked about the purpose of [Raincoast's 2009 technical report](#), at page 2, and Dr. Paquet spoke about the methodology and analysis involved in the report, agreeing that it does not mention NGP specifically. Ms. Estep pointed out that the report analyzes vessel routes that roughly coincide with those proposed by NGP and Dr. Paquet

explained that such routes were provided to address various proposals in the area, and to discuss least cost vessel routes. 14625

### **Raincoast's determinations of shipping routes and risk assessments**

Ms. Estep asked further questions about shipping routes and risk assessments described in the report. Dr. Paquet again confirmed that the report was not prepared to speak to the NGP project, but to demonstrate a general framework for analyzing various projects in the area, in general. 14633

Dr. Paquet provided an explanation of the concept and methods used to determine *least coast pathways*, which represent “the easiest routes that accumulate the least costs environmentally”. Discussion on the subject continued, with Ms. Estep and Dr. Paquet agreeing that the model used in the report is insufficient to draw project-based routing conclusions in the example it uses. 14640-14673

### **Determining marine mammal distribution and abundance in the Pacific Coast**

Ms. Estep asked questions about Raincoast's marine mammal survey work, with Dr. Paquet agreeing that one of the motivations behind the work was to gain data on marine mammal distribution and abundance in Canada's Pacific Coastal waters in 2004, when less data was available on the subject. 14674

Pulling up [Exhibit D170-2-6](#), page 30, Ms. Estep asked which areas of the Confined Channel Assessment Area (CCAA) were included in the mammal survey work and how such areas were determined for inclusion in the study. Ms. MacDuffee explained that the surveys were done before the CCAA was established, so were not specific to that area. 14688

Dr. Paquet confirmed that the abundance estimates do not apply to the areas in the CCAA where there is no survey data. Ms. Estep asked for further details on the modelling and density data shown on page 31 of the report, seeking to understand how aggregation of the data was derived. Discussion continued with the witnesses providing further explanation of the presentation of data in various maps. 14720

Ms. Estep brought up [Exhibit B85-2](#), to depict NGP's core humpback whale area. The area was compared to that given in the previously discussed map from Raincoast's report. The witnesses pointed out that NGP's identified area is not a complete depiction of the core humpback concentration areas. They agreed that Douglas Channel and Kitimat Arm are amongst the lowest density areas for marine mammals. 14814

### **Raincoast's criticisms of Stantec's work**

Dr. Paquet answered questions related to his organization's critique of the marine mammal survey work done by Stantec, NGP's consultant. He explained the difference between the two organizations' survey designs, pointing out the concern that Stantec's transects were inappropriate for the survey it was conducting. 14859

Ms. Estep continued with a review of Stantec's work, and Dr. Paquet explained concerns such as the fact that Stantec's aerial and vessel-based field surveys used to determine

minimum animal counts, were not appropriate methods for such an objective. Discussion continued. 14873

### **Validation of Raincoast's data**

Dr. Paquet discussed the validation of Raincoast's data using data from DFO. He explained the differences between the two data sets and the respective collection methods. Ms. Estep asked if Raincoast could have used NGP's data to validate its modelling, and Dr. Paquet explained concerns that NGP's data was incomplete. He also pointed out that DFO's data was collected over a longer period of time, using a variety of sources. 14913

### **The availability of Raincoast's data**

Ms. Estep asked about Dr. Paquet's knowledge of NGP contacting Raincoast in an attempt to obtain the organization's marine mammal data. The witness answered that he had heard that former employee, Dr. Rob Williams had been contacted by NGP, but when asked about it, Dr. Williams indicated that such contact had not been made. Dr. Paquet also pointed out that Raincoast had submitted its response to NGP's submission before hearing of the company's request for data. 14991

Dr. Paquet confirmed that the organization was "very aware" of NGP's interest in working with the various groups that have marine mammal data, as well as Aboriginal organizations, in an effort to integrate such information. He also agreed that Raincoast has met with NGP in 2012 to discuss collaboration and that the organization would continue such discussions following the JRP hearings. 15012

Discussion returned to NGP's methodology for its marine mammal density surveys, with Ms. Estep pointing to the company's commitment to using the survey design that Raincoast had advocated for, as written in [Exhibit B85-2](#), page 15. Dr. Paquet acknowledged the commitment and spoke about the need to do such surveys earlier in an environmental assessment, prior to the decision-making phase of a project. 15023

Ms. Estep highlighted further NGP commitments in relation to marine mammal surveying in the CCAA, namely, to conduct such surveys for a minimum of 3 years prior to operations and for 3 years afterwards. She asked if Dr. Paquet was aware of a similar commitment by other project proponents, he answered that he had been aware of such commitments for projects, but not those specifically for testing marine mammal density. 15054

Dr. Paquet described the need to expand the marine mammal work that had been done to date, both spatially and temporally. Ms. Estep asked about Raincoast's interest in continuing such work with NGP and other groups, and Dr. Paquet again indicated interest. 15080

Dr. Paquet confirmed knowledge of NGP's commitment to conduct quantitative modelling to delineate high-risk areas for vessel strikes of marine mammals, and confirmed Raincoast's interest in participating in such work. 15102

### **Impacts to sea otters**

Ms. Estep asked about Raincoast's surveys and knowledge of sea otter density. She asked about the organization's criticisms of NGP's lack of assessment of the Project's impacts to sea otters in the CCAA. Dr. Paquet spoke about the risk of operations affecting sea otters in terms of displacement. Ms. Estep pointed out that Raincoast didn't provide evidence on effects pathways between the species and tankers. 15118

Ms. Estep brought the witnesses attention to NGP's acknowledgement of the threat of oil spills to sea otters and their habitat, and its commitment to updating the species' distribution information in its oil spill response planning. 15158

### **Raincoast's risk analysis maps**

Ms. Estep asked about the authorship of Raincoast's risk analysis, in [Exhibit D170-2-6](#), beginning with page 36. Dr. Paquet answered questions about the organization's decision to focus on marine mammals, marine birds, and salmonids for the analysis, which was largely a function of data availability. Mr. Rosenberger answered further questions about Raincoast's calculations of risk probabilities based on NGP's QRA. Discussion continued. 15173

Mr. Rosenberger described how Raincoast developed the polygons shown in [Exhibit D170-2-7](#), page 5. Discussion on the maps continued, turning to probabilities of spill return periods. 15211

Noting Raincoast's indications of spill return periods, Ms. Estep asked for agreement that risk of vessel grounding would increase closer to Haida Gwaii than further offshore. Mr. Falconer explained that there are deeper waters adjacent to the landmass, as well as shallower segments in Hecate Strait. Discussion continued on the subject, in relation to the risk assessment maps. 15257

Ms. Estep continued with detailed questions for the witnesses about the generation of information depicted on their maps. Please see the transcript for details. 15274-15341

### **Questions about Ms. Terhune's work**

Ms. Estep asked about Ms. Terhune's professional background and energy campaign work with Living Oceans Society. Ms. Terhune confirmed the Society's position of opposition to oil tankers on BC's inner coast. 15349

Ms. Terhune agreed that she did not possess engineering credentials. She was then asked about the Society's report, "The Tanker Technology Limitations of Double Hulls", which she agreed would not have been possible without funding from the Tides Foundation. She also agreed that the report was a popular report, in that it was "meant to provide information to stimulate rational dialogue among the public audience to provide educated materials". Ms. Estep noted that other parties had adopted the report in their evidence. 15369-15396

### **Mr. Jasny's work and the National Resource Defense Council**

Ms. Estep asked about the relationship between NRDC and Raincoast, and asked which organization Mr. Jasny was representing at the hearings. Mr. Jasny confirmed that Raincoast did not retain him to prepare the NRDC submission on their behalf. 15422

Ms. Estep noted NRDC's comments that the organization has helped to “*lead the environmental community in advancing policy on the impacts of underwater noise on marine wildlife*”, from page 1 of [Exhibit D170-2-13](#). She asked what such advancement meant in the context of the JRP. Mr. Jasny spoke about NRDC's history of advocating for regulatory compliance and mitigation efforts on the issue of underwater noise, particularly in the oil and gas exploration industries, which motivated his participation the JRP. 15431-15436

Noting NRDC's comments in the Exhibit that the project's underwater noise poses “*significant risk to BC coastal wildlife*”, Ms. Estep asked if an environmental assessment had been conducted. Mr. Jasny confirmed that the statement was qualitative, and that an EA hadn't been performed. He also confirmed his understanding that various vessels were currently using the project's proposed tanker routes. Discussion continued on the witness's thoughts on the hazardous nature of the routes. 15437-15478

### **Acoustic impacts of large vessels**

Using [Exhibit B85-2](#), page 18, Ms. Estep brought the witness through various measures proposed by NGP to mitigate vessel-based underwater sound. Mr. Jasny pointed out that NGP's proposed speed restrictions “*would not eliminate cavitation...which is the largest contributor to ocean noise from large vessels*”. 15480-15498

Ms. Estep noted the statement, “*large tankers produce more underwater noise than any other class of commercial vessel*”, from page 3 of the Exhibit, questioning the validity of the reference for such a statement. Mr. Jasny agreed that the source of his evidence on the subject points to VLCC vessels creating less sound than supertankers. 15502-15526

Discussion turned to the proposed speed limitations for NGP vessels and the resulting acoustic outputs. Mr. Jasny agreed that vessel speed “tends to be most strongly correlated with acoustic output when you're considering a wide class of vessels together”. Ms. Estep asked if Mr. Jasny agreed that NGP's tankers travelling in the CCAA would produce less acoustic emissions than a normal supertanker. Mr. Jasny explained that more factors need to be considered to make such a determination. 15527-15554

Mr. Jasny corrected an earlier statement, pointing out that VLCC's do produce the greatest acoustic output of any commercial class of vessel, given that their size puts them into the supertanker size category. He agreed that reduced speeds would provide benefits. 15560

Ms. Estep went over the suggested mitigation measures for impacts to marine mammals, in the NRDC report, pointing out various commitments by NGP, which would meet such measures, such as the use of AIS and the establishment of an acoustic monitoring system. Discussion continued about the efficacy of NGP's commitments in terms of mitigating

acoustic impacts to marine mammals. Dr. Paquet asked for clarification between the terms *commitment* and *consideration* of such measures. Ms. Estep stated that NGP had committed to using passive acoustic monitoring, in some form, with some qualification.

15567