SCIENCE RESPONSE TO INFORMATION REQUESTS SUBMITTED TO THE ENBRIDGE PIPELINE PROJECT ENVIRONMENTAL IMPACT ASSESSMENT HEARINGS RESPECTING AQUATIC INVASIVE SPECIES

Context

Fisheries and Oceans Canada's (DFO) Environmental Assessment and Major Projects Division (EAMP), Pacific Region, requested that DFO Science, Pacific Region, on May 15, 2012, provide information regarding specific Information Requests (IRs) submitted to the Enbridge Review Panel that DFO Science has the expertise to evaluate. As the IRs for which Science advice was requested cover a range of issues and scientific disciplines, separate Science Responses have been developed for each category of IRs, and in some cases specific IRs. In addition to science related questions, some IRs included elements that were questions pertaining to DFO policy, management or legal information. This Science Response addresses the scientific elements of the following questions:

- What aquatic invasive species have been considered of particular risk for the BC coast from shipping or ballast water discharge?
- What is the status of assessments of biological, economic and social risks of aquatic invasive species in the marine environment surrounding Haida Gwaii and the SGaan Kinghlas Bowie Seamount Marine Protected Area?
- Have priorities and objectives been set for prevention, eradication, or control of risks posed by aquatic invasive species from ballast water in BC? If so, what are they?
- What steps have been taken to establish a monitoring and reporting system to track the effectiveness of actions taken toward its aquatic invasive species objectives and to report annually on progress?
- What plans, if any, are there for early detection of, or rapid response to, aquatic invasive species in Haida Gwaii and SGaan Kinghlas Bowie Seamount Marine Protected Area?
- What systems are in place to respond quickly to release of invasive species and the invasive species removal from the environment?

This Science Response report is from the Fisheries and Oceans Canada, Canadian Science Advisory Secretariat, Regional Science Special Response Process (SSRP) of May 29th, 2012 on the Science advice in response to information requests submitted by Intervenors to the Enbridge Northern Gateway pipeline project environmental assessment Panel Review Process. Additional publications from this process will be posted as they become available on the Fisheries and Oceans Canada Science Advisory Schedule at www.dfo-mpo.gc.ca/csas-sccs/index-eng.htm.

Background

The Enbridge Northern Gateway Project proposes to ship dilute bitumen from Kitimat, British Columbia to markets in China and California with tankers of the class Very Large Crude Carriers (VLCC) (Vol. 1, B1-2, Enbridge Northern Gateway Project Section 52 Application). The tanker route from Kitimat through confined waterways in British Columbia and then into open waters of Hecate Strait, Dixon Entrance and Queen Charlotte Sound in British Columbia are illustrated in Figure 1. For assessment purposes Enbridge Northern Gateway defines two areas, the Confined Channel Assessment Area (CCAA) (Figure 2) and the Open Water Assessment Area (OWAA) which is BC waters to the territorial sea limit (Figure 1). Incoming ships will deliver cargoes of condensate. Enbridge Northern Gateway estimate 71 condensate and 149 oil tankers call in at the Kitimat terminal for a total of 440 transits per year (Vol. 8C, B3-37, Enbridge Northern Gateway Project Section 52 Application).

There were two IR submissions made to the Joint Review Panel (JRP) by DFO. Enbridge Northern Gateway provided responses to requests for information in the IRs. Since then Intervener review of the Environmental Assessment documents prepared by the proponent (Enbridge Northern Gateway) and of the IRs and the responses by the proponent has resulted in a series of further questions to DFO by Interveners.

The Canadian Council of Fisheries and Aquaculture Ministers Aquatic Invasive Species Task Group (2004) identified prevention as a key component of Canada's action plan to combat aquatic invasive species. Transport Canada is the agency responsible for commercial shipping and there are provisions in the *Canada Shipping Act* requiring ballast water management plans and ballast water exchange for vessels entering Canada's exclusive economic zone (EEZ) intended to reduce the risk posed by aquatic invasive species in ballast tanks. Ballast water management including mid-ocean exchange is intended to reduce the risk of introducing ballast water-mediated aquatic invasive species.

DFO Science has completed a science-based framework for rapid response to aquatic invasive species in Canada (Locke et al. 2011). The management / implementation aspects related to rapid response within DFO and potential linkages to other local, provincial, or federal agencies are yet to be established. No specific rapid response plans for aquatic invasive species have been developed in BC. Currently, there are no targeted early detection networks but the detection of a suspected aquatic invasive species can be reported to DFO via e-mail at AISPACIFIC@pac.dfo-mpo.gc.ca or phone at 1-888-356-7525.

Currently there are no rapid response plans in Pacific Region to respond quickly to potential aquatic invasive species reports or release events. Response and potential control measures, including eradication, for aquatic invasive species need to be considered in an overall risk analysis framework and potential management options could be informed by DFO Science but not lead by them. DFO Pacific has an internal protocol that outlines actions to be taken when AIS are reported to the department but stops short of outlining potential management options. DFO Science has developed the science components of a rapid response framework (Locke et al. 2011) that could assist with decision making in the interim.

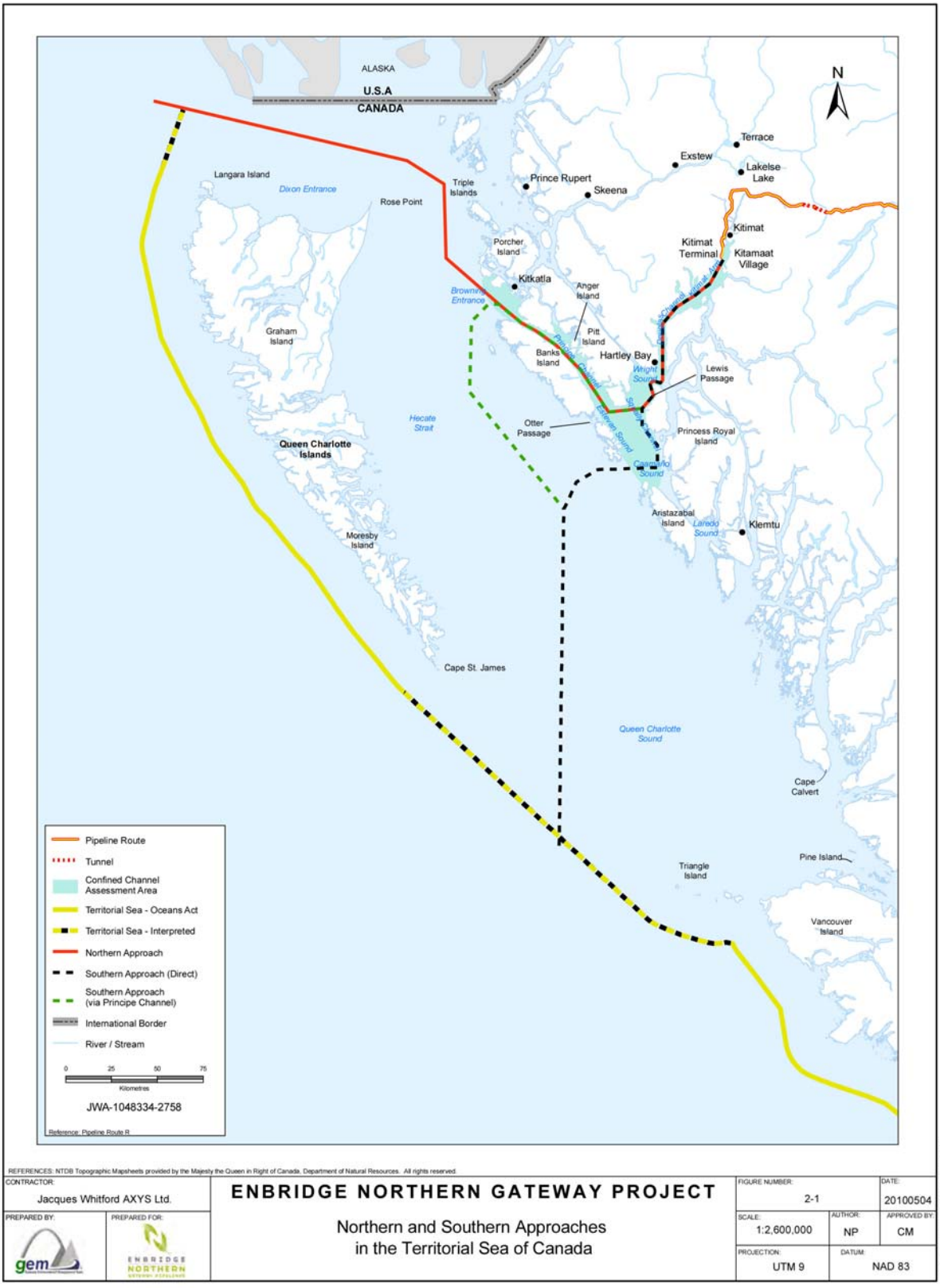

Figure 1. Map illustrating the proposed tanker routes through the Confined Channel and Open Water Assessment Areas (CCAA and OWAA). The OWAA extends to the territorial sea boundary (from Volume B9-42 Enbridge Northern Gateway Project).

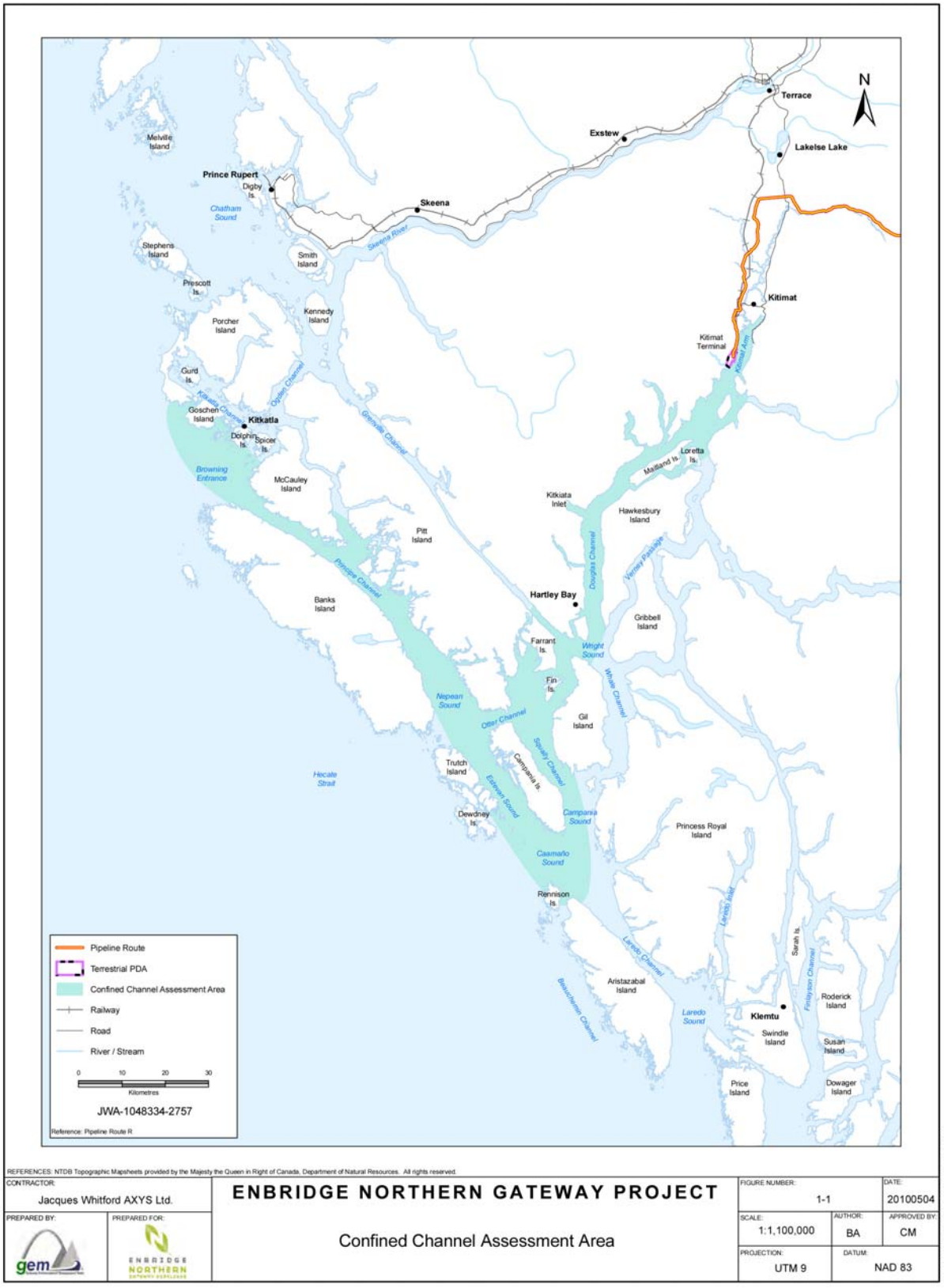

Figure 2. Map illustrating the location and extent of the Confined Channel Assessment Area (CCAA) (from Volume 8B Enbridge Northern Gateway Project Section 52 Application).

Analysis and Responses

Commercial shipping has been identified as an important vector for the introduction and spread of aquatic invasive species (AIS) (e.g., Ruiz et al. 2000). Biological risk assessments completed for five species of tunicates (Therriault and Herborg 2008c) and two crab species (Therriault et al., 2008a; 2008b) have identified the potential role commercial ships could play in the introduction or spread of these species in BC. As part of an ongoing national risk assessment project the relative risk of international and domestic shipping vectors, including ballast water and hull fouling, was to be assessed (S. Bailey, C&A, project lead). A priority list of potential high risk aquatic invasive species for BC has not been developed.

At a larger spatial scale the biological risk assessments conducted for the tunicate (Therriault and Herborg, 2008c) and crab species (Therriault et al. 2008a; 2008b) included the waters surrounding Haida Gwaii. Biological risk assessments have not been completed for specific marine waters in BC at smaller spatial resolutions, such as Marine Protected Areas. Socio-economic assessments are being conducted on a pilot basis across the country but none are being done in Haida Gwaii or the SGaan Kinghlas Bowie Seamount.

Data collected as part of ongoing DFO Science monitoring of marine waters, including intertidal beach surveys, subtidal collector plate surveys, and targeted trapping for European green crab, are archived with the Shellfish Data Unit at the Pacific Biological Station in Nanaimo. Information on specific aquatic invasive species has been uploaded to the National DFO AIS Database when requested. In the past, novel findings from aquatic invasive species monitoring programs have been reported in the Pacific Region State of the Ocean Report. The AIS program's funding is reported annually through the department's Report on Plans and Priorities.

Conclusions

Not all non-indigenous species will become invasive. The Canadian Council of Fisheries and Aquaculture Ministers Aquatic Invasive Species Task Group (2004) defined invasive alien species as "those harmful alien species whose introduction or spread threatens the environment, the economy or society, including human health". Thus, it is important that a risk-based approach be used to identify those species that pose the greatest risk regardless of the vector of introduction. Further, rapid response plans for these higher risk species could be developed to ensure a timely, coordinated and meaningful outcome should an intervention be deemed necessary or required. Also, monitoring programs should consider locations most likely to be invaded first, or that have increased sensitivity to these higher risk species and the appropriate monitoring strategies be employed. Information on the potential distribution of an aquatic invasive species also could help inform monitoring programs. Priorities and objectives for the prevention, eradication and control posed by AIS are beyond the responsibility of DFO Science. DFO Science branch's role is to provide science-related advice on the risks posed by AIS.

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Sources of Information

Additional publications from this process will be posted as they become available on the Fisheries and Oceans Canada Science Advisory Schedule at www.dfo-mpo.gc.ca/csas-sccs/index-eng.htm.

Canadian Council of Fisheries and Aquaculture Ministers Aquatic Invasive Task Group. 2004. A Canadian Action Plan to Address the Threat of Aquatic Invasive Species. September, 2004. [www.dfo-mpo.gc.ca/Science/enviro/ais-eae/plan/plan-eng.pdf]

Enbridge Northern Gateway Project Joint Review Panel 2012. https://www.neb-one.gc.ca/ll-eng/livelink.exe/fetch/2000/90464/90552/384192/620327/customview.html?func=ll&objId=620327&objAction=browse&sort=-name. Accessed May 22, 2012

Locke, A., Mandrak, N.E., and Therriault, T.W. 2011. A Canadian Rapid Response Framework for Aquatic Invasive Species. DFO Can. Sci. Advis. Sec. Res. Doc. 2010/114. vi + 30 p.

Ruiz, G.M., Fofonoff, P.W., Carlton, J.T., Wonham, M.J. and Hines, A.H. 2000. Invasion of coastal marine communities in North America: apparent patterns, processes, and biases. Annual Review of Ecology and Systematics 31, 481-531.

Therriault, T.W., Herborg, L.-M., Locke, A. and McKindsey, C.W. 2008a. Risk Assessment for Chinese mitten crab (*Eriocheir sinensis*) in Canadian Waters. DFO Can. Sci. Advis. Sec. Res. Doc. 2008/041: iv + 33 p.

Therriault, T.W., Herborg, L.-M., Locke, A. and McKindsey, C.W. 2008b. Risk Assessment for European green crab (*Carcinus maenas*) in Canadian Waters. DFO Can. Sci. Advis. Sec. Res. Doc. 2008/042: iv + 40 p.

Therriault, T.W. and Herborg, L.-M. 2008c. Risk assessment for Two Solitary and Three Colonial Tunicates in Both Atlantic and Pacific Canadian Waters. DFO Can. Sci. Advis. Sec. Res. Doc. 2007/063: iv + 64 p.

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ISSN 1919-3750 (Print)
ISSN 1919-3769 (Online)

La version française est disponible à l'adresse ci-dessus.

Correct Citation for this Publication:

DFO. 2013. Science response to information requests submitted to the Enbridge pipeline project environmental impact assessment hearings respecting aquatic invasive species. DFO Can. Sci. Advis. Sec. Sci. Resp. 2012/032.