Ecological and Oceanographic Criteria for Alternate Ballast Water Exchange Areas in the Pacific Region

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Definition Of The Problem

- We do have Aquatic Invasive Species (AIS) in BC waters
- AIS are the focus of a new, multi-departmental, federal program
- We know from surveys that viable alien species are arriving in ballast water
- Mid-Ocean Exchange (MOE) is (of course) the preferred option
- Major BC ports have Mid-Ocean Exchange (MOE) protocols, with provision for ABWEAs
- DFO Science staff have been asked to provide advice on suitability of ABWEAs proposed by the regulator (Transport Canada) – are the proposed ABWEAs appropriate?



Vessel Traffic Patterns

(MCTS data Courtesy O'Hara)



Exchange transects in the north Pacific (from Levings et al. 2004) (data courtesy Vancouver Port)

Draft Annex II - Transport Canada's proposed alternate ballast water exchange zone

"A vessel that has been unable to carry out ballast water exchange due to weather or other reasonable circumstance may on notification of Transport Canada, through the Canadian Coast Guard MCTS referenced in section 3 of this annex, exchange ballast in waters under Canadian jurisdiction provided the exchange is carried in waters of at least <u>200 m depth</u> and at least <u>50 nautical miles</u> from the nearest land."





Key Ecosystem and Habitats /Ecologically and Biologically Sensitive Areas (What do we worry about?)

- Pilot or proposed Marine Protected Areas
- Important fishing areas
- Fish spawning grounds
- Areas of high primary or secondary productivity

- Aquaculture sites
- Submarine features promoting landward transport in estuarine processes
- Seamounts
- Shorelines and estuaries





Halibut spawning grounds







Exemptions and Coastal Issues

There is consensus among Canadian and US ecologists working on ballast water that coastwise and estuary-to-estuary transport of ballast water organisms along the west coast of North America is problematic

Rationale:

- 1. A number of invertebrate taxa exhibit direct development, without planktonic larvae, and hence their populations are restricted to particular bays or estuaries
- 2. The transit time from key ports north of Cape Blanco to BC and Washington waters is short, likely less than 3 days, which is much faster than might be expected if larvae or other propagules travel only with the currents
- 3. River to river transport of ballast water (e.g. Columbia to Fraser) is also a concern

Primary Recommendations

An amendment of the draft Annex II zone is suggested:

With the exception of Bowie Seamount (50 n mi diameter (92.6 km) exclusion) and western Queen Charlotte Sound (50 n mi (92.6 km) headland to headland), our proposed alternate ballast water exchange zone includes any waters more than 50 nautical miles (92.6 km) from the coast and west of the 500 m depth contour.

Unexchanged ballast water from certain coastal ports north of Cape Blanco discharged in the interconnecting waterways of Strait of Georgia, Puget Sound, and Juan de Fuca Strait poses a risk to these ecosystems. Exemptions from mandatory ballast water exchange for these vessels should be reviewed.

Several research projects are suggested to improve knowledge of risk factors associated with ballast water organisms in Pacific Region.

More Research

- If "special" ABWEAs are required inshore of the 50 n mi / 500 metre boundary, they will require specific consideration
- A "coast-wide" approach to monitoring and detection of NIS is appropriate
- "biogeographic provinces" as a basis for ballast water regulation/management needs careful assessment
- Cost-effective onshore and onboard treatment technologies
- Improved method to survey for AIS on ships that have not completed MOE to better assess risks
- Investigate the concept of "listing" or categorizing ports for particularly dangerous AIS
- Improved evaluations of other sources of AIS (fouling; sea chests; NOBOB vessels.
- Investigate / assess specific conditions that might compromise ABWEAs

Some publications

DFO National Workshop on Alternative Ballast Water Exchange Zones (2004)	http://www.dfo- mpo.gc.ca/csas/Csas/proceeding s/2004/PRO2004_042_B.pdf
Levings and Foreman (2004) CSAS Res Doc 2004/118 -Ecological and Oceanographic Criteria for Alternate Ballast Water Exchange Zones in the Pacific Region .	http://www.dfo- mpo.gc.ca/csas/Csas/publications /ResDocs- DocRech/2004/2004_118_e.htm
Larson et al (2003). Dispersal of discharged ship ballast water J. Environ. Eng. Sci. 2: 163-176 (2003)	http://article.pubs.nrc- cnrc.gc.ca/ppv/RPViewDoc?_han dler_=HandleInitialGet&journal=je es&volume=2&calyLang=eng&arti cleFile=s03-014.pdf

