Skeena Salmon
Skeena Estuary

Version 1.2, February 2014

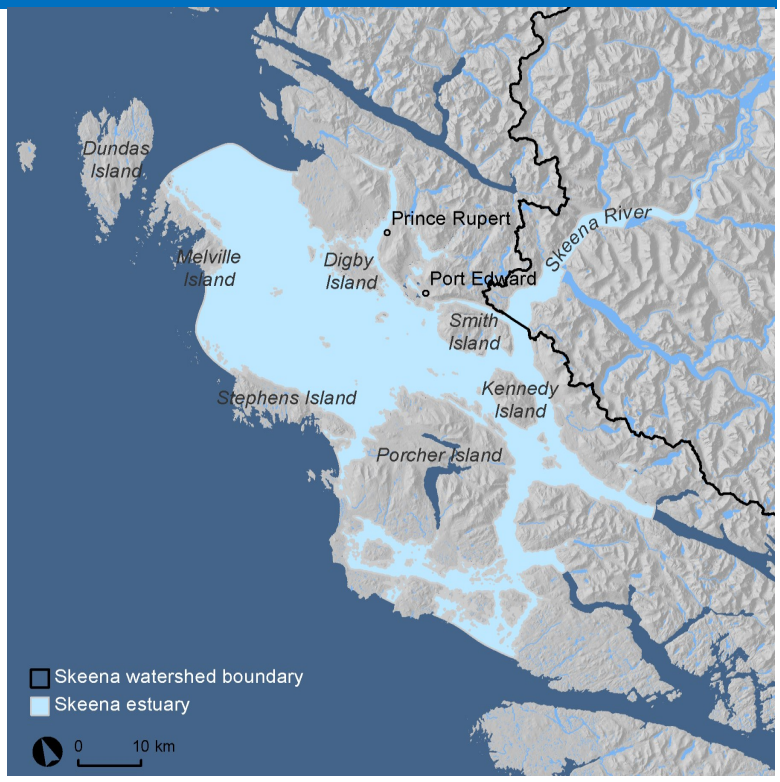
Introduction

This habitat report card was developed by the Pacific Salmon Foundation with technical support from ESSA Technologies. This project summarizes pressures on habitat used by Skeena salmon for migration, spawning, rearing and incubation, as well as their relative vulnerability to those pressures. Report cards are available for each individual CU in the Skeena watershed; this supplementary 'Skeena Estuary' report card summarizes information for estuary indicators that are important for all Skeena salmon CUs. For a summary explanation of the indicators shown below, please see the end of this report card. All report cards, as well as a detailed report with full methods and results are available at www.skeenasalmonprogram.ca.

Narrative

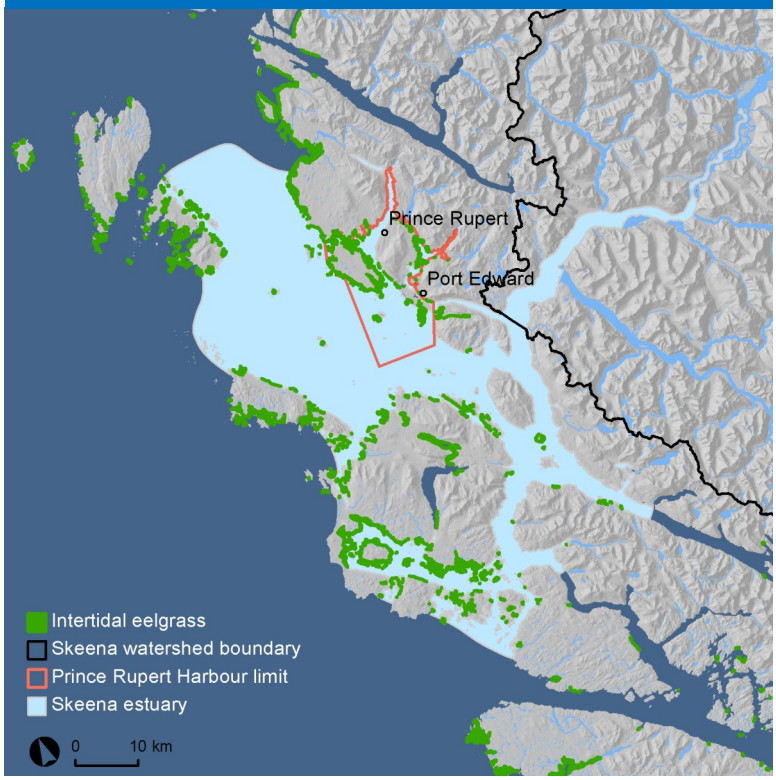
* Skeena estuary is the second largest in BC after the Fraser and is the most important ecologic, socio-cultural, and economic zone on the BC north coast;
* Skeena estuary is unique in that it possesses an inner and outer series of islands, multiple channels and intertidal passages, and an area of mudflats and soft sediments as Skeena River debouches into the increasing salinity of Chatham Sound, Hecate Strait, and Dixon Entrance;
* Skeena estuary extends from the Kwinitsa–Kasiks area through the mouth of the Skeena flaring to Pitt Island in the south and to Dundas Island in the north where Skeena River water mixes with waters of the Nass River and Portland Canal tributaries forming a mega-estuary;
* Skeena estuary circulation patterns are complex with the seasonal and diurnal contraction and expansion due to the broad range of Skeena River flows, tides, winds, Coriolis effect, and vertical and horizontal mixing of salt and freshwater;
* Skeena salmon, many species of foraging fish, and approximately 80% of coastal wildlife are dependent on estuaries for some portion of their life cycle. All Skeena salmon spend part of their life in the estuary, and therefore depend on its health as juveniles and returning adults;
* Skeena estuary and its roughly 2,500 ha of wetlands is a biological powerhouse because it provides a diversity of food sources and habitats that support large populations of fish and wildlife in a concentrated area, and plays a critical role in carbon sequestration;
* Expansion of industrial development by Port of Prince Rupert threatens essential nursery and juvenile rearing habitats. A lack of understanding Skeena estuarine ecology, the lack of an estuary management plan, and the site-by-site development approach seriously limits habitat protection.

Estuary location

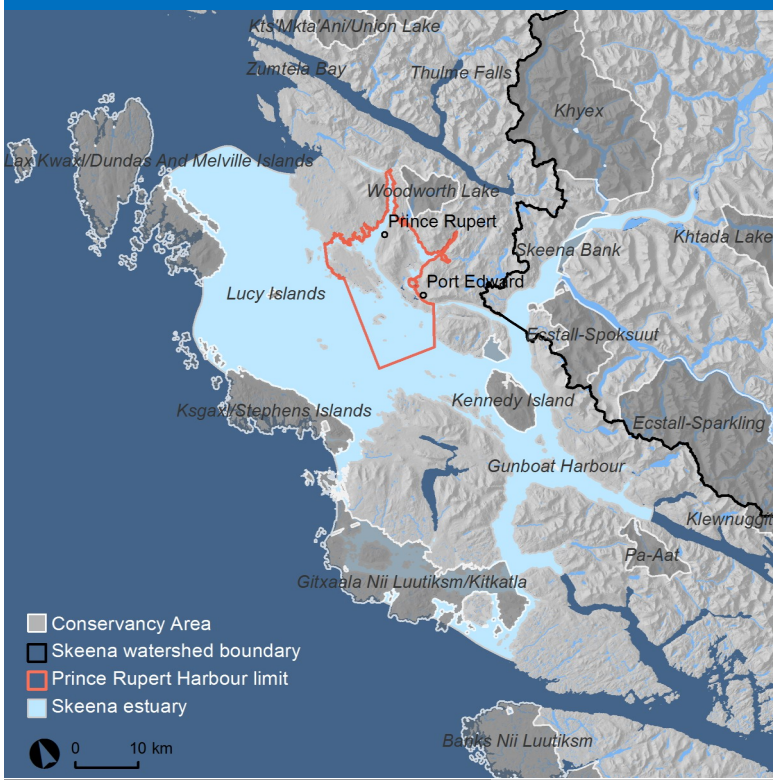


Total estuary area	1,802 km^2

Eelgrass habitat

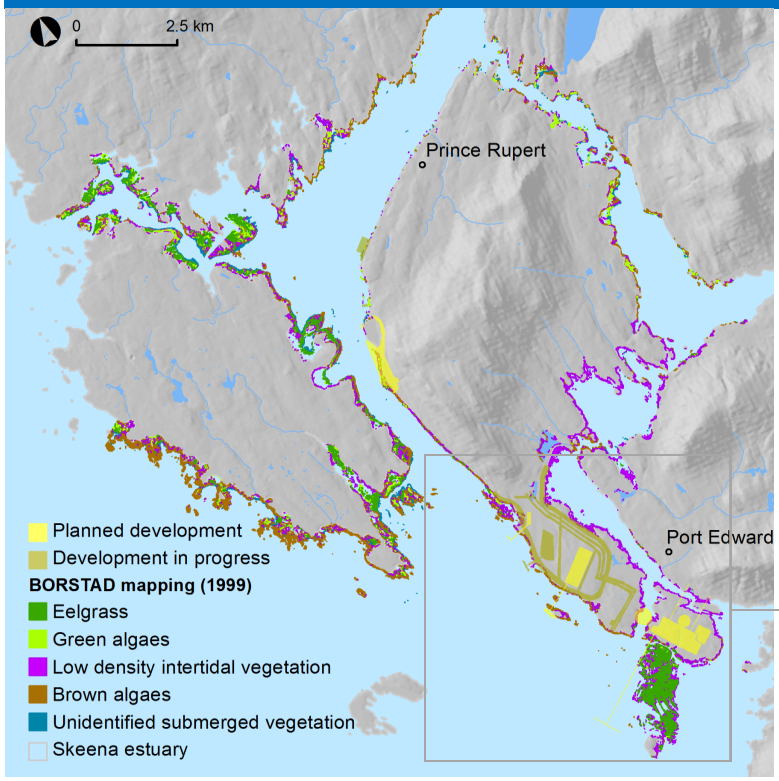


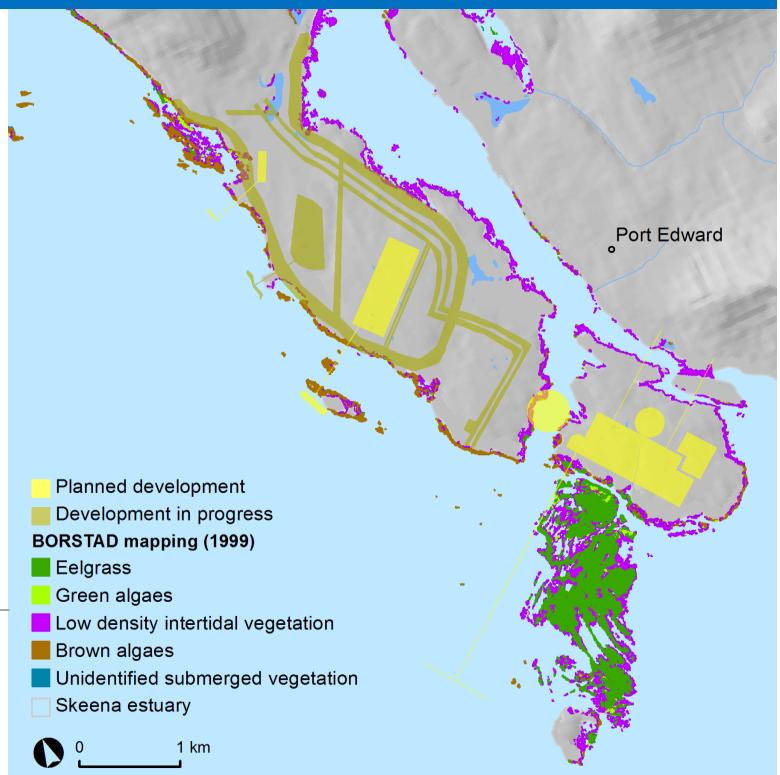
BC Parks Conservancies



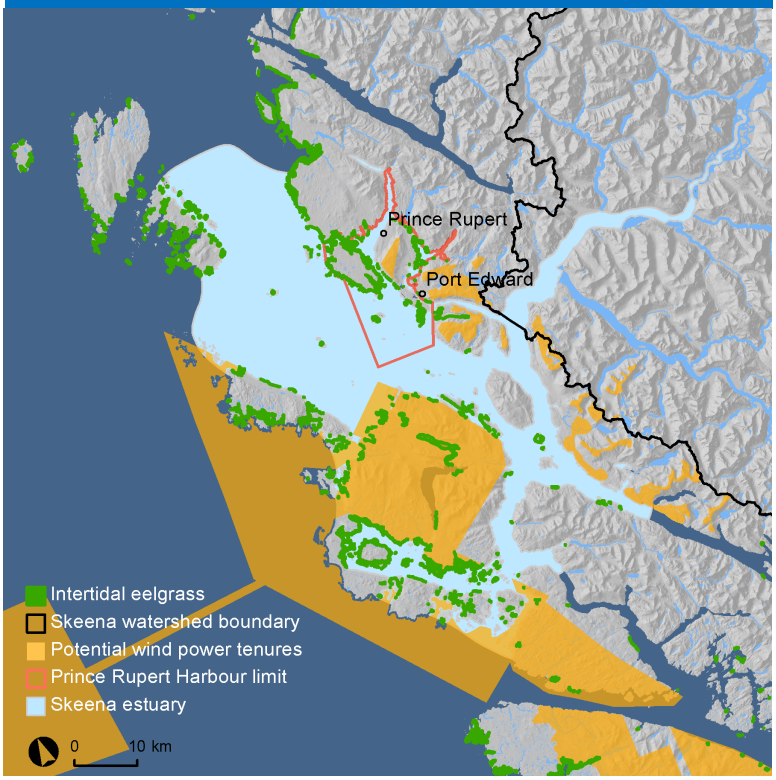
Prince Rupert Harbour limit area	263 km^2

BORSTAD habitat mapping

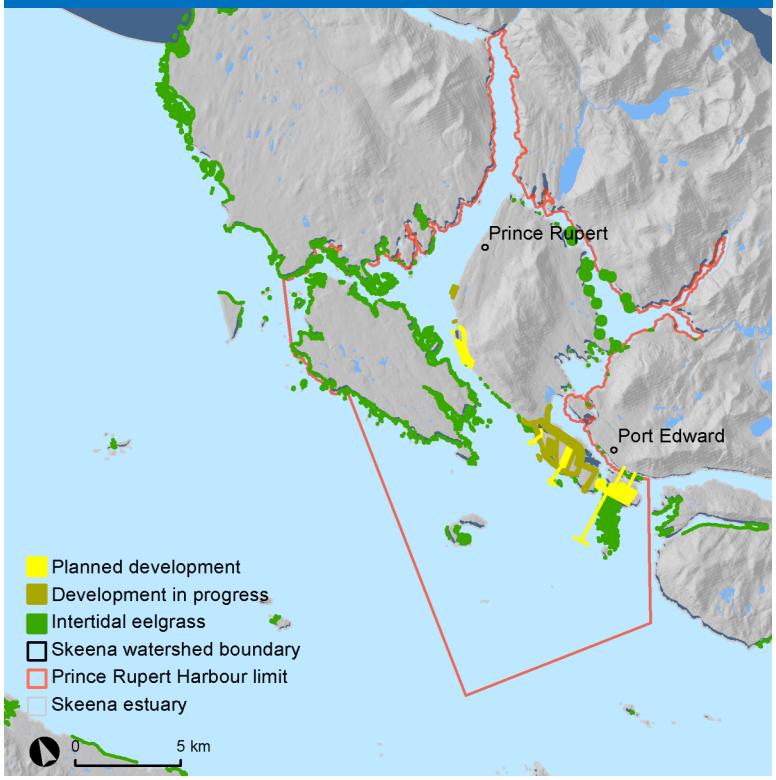




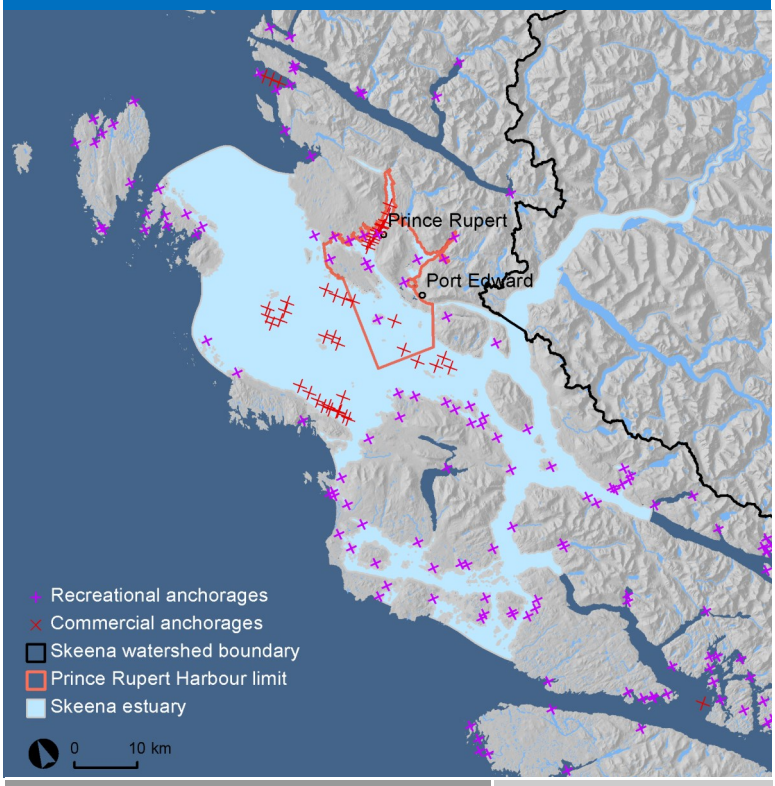
Potential wind power tenures



Harbour development

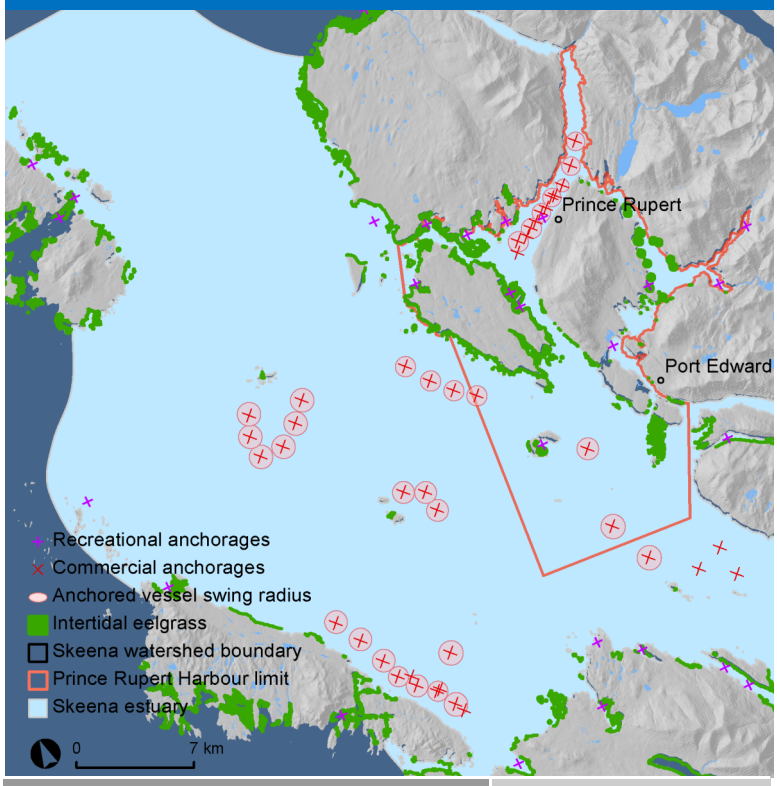


Anchorages



Recreational (count within estuary)	73
Commercial (count within estuary)	50

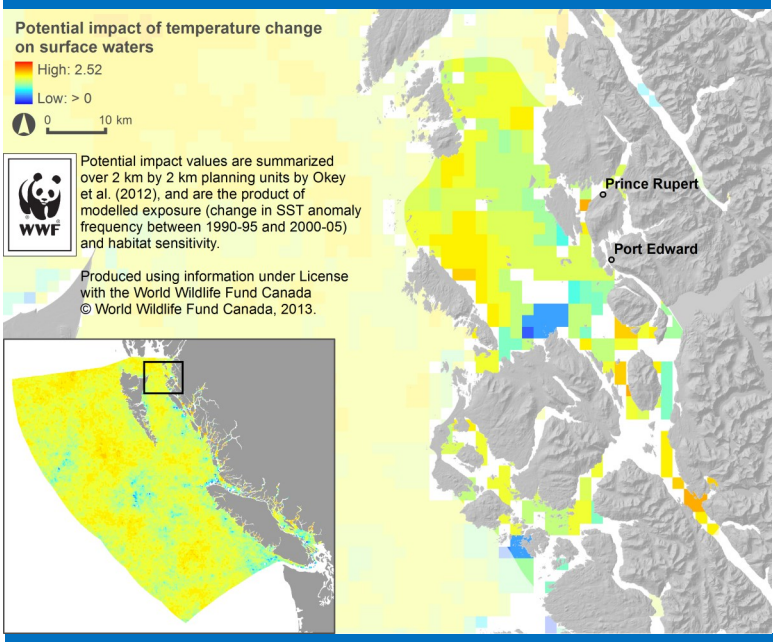
Anchorages detail



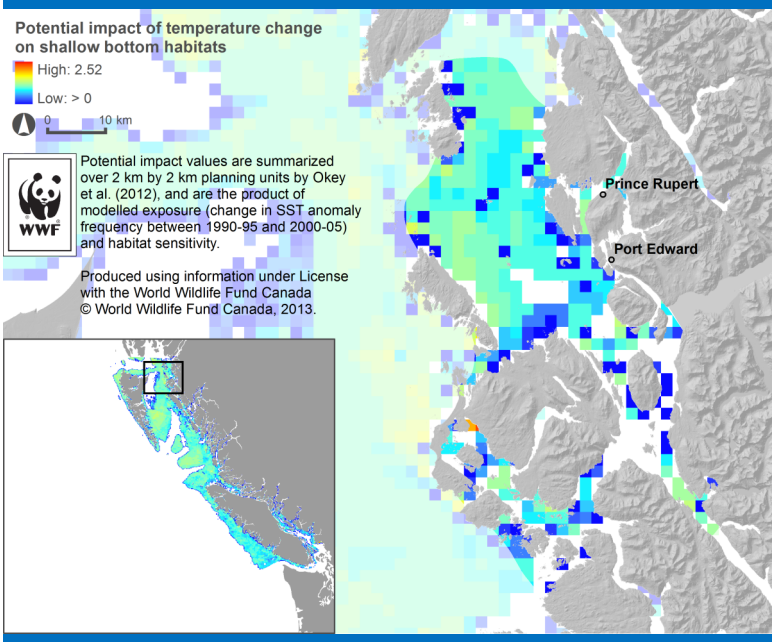
Swing radius total area*	39.9 km^2
% of total estuary	2.2%

*Swing radius data are not available for some commercial (or any recreational) anchorages

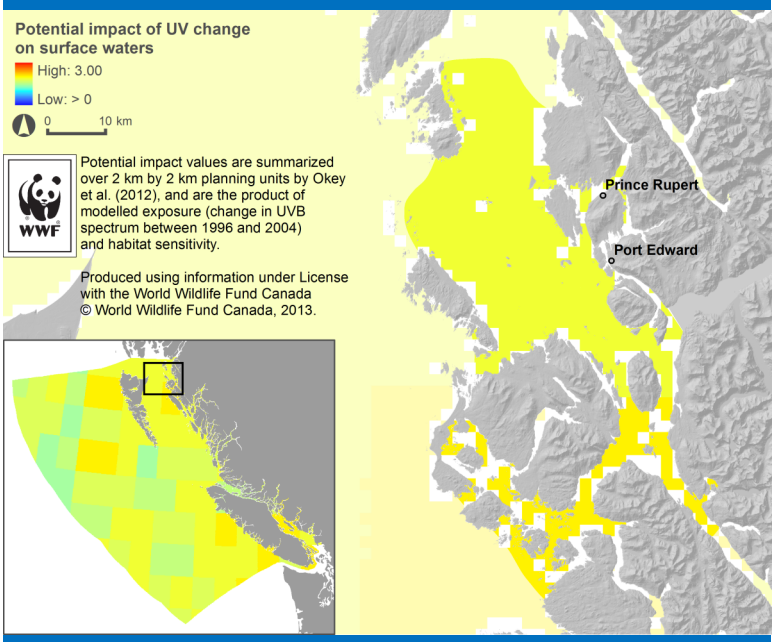
Climate impacts—temperature (surface waters)



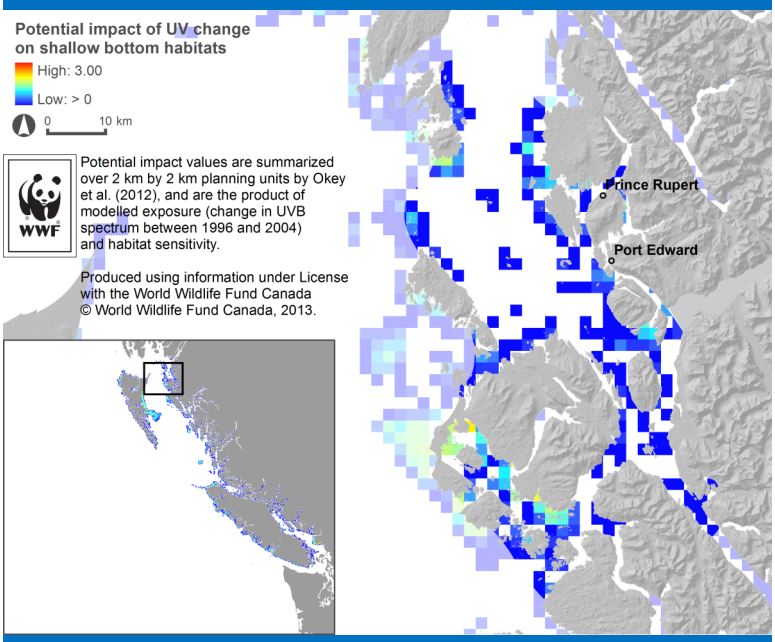
Climate impacts—temperature (bottom habitats)



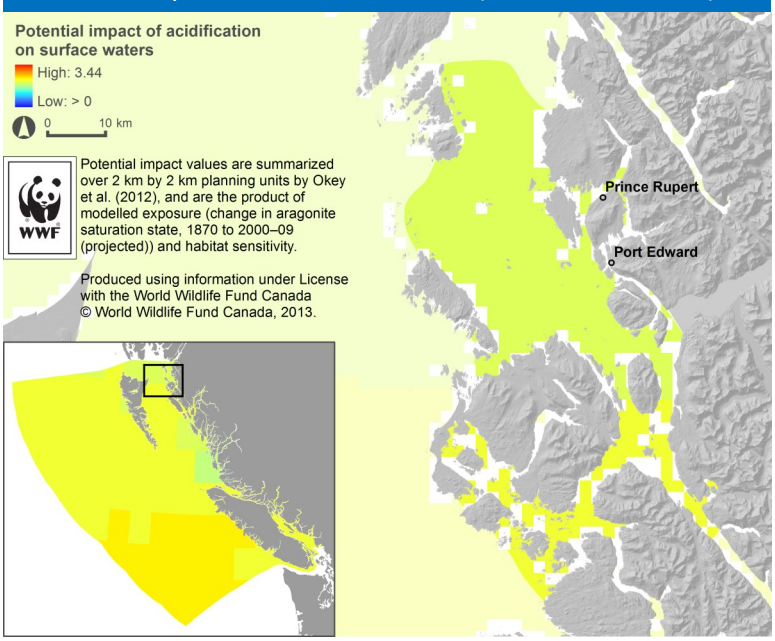
Climate impacts—UV (surface waters)



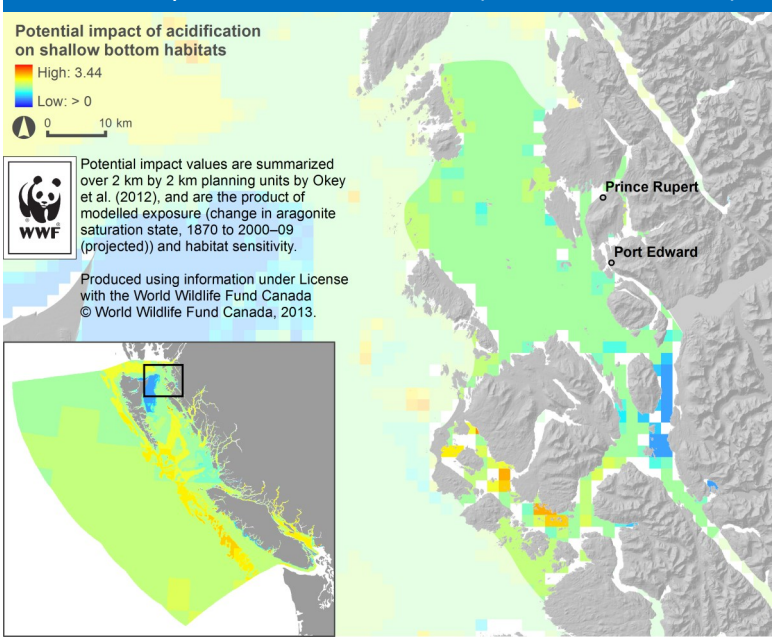
Climate impacts—UV (bottom habitats)



Climate impacts—acidification (surface waters)



Climate impacts—acidification (bottom habitats)



Skeena estuary report card summary

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1. Estuary Location. Map showing the location and extent of the Skeena River estuary. Juvenile salmon smolts emigrate to salt water after beginning their lives in freshwater lakes and rivers, and spend the first part of their marine lives in estuaries. Early marine survival is dependent on abundant food resources and sheltered estuarine habitats. Although residence time in the estuary varies depending on species and life history type, all Pacific salmon are dependent to a degree on healthy estuarine habitats to maintain their populations.

2. Total Estuary Area. Total estuary area provides an indication of the potential amount of useable estuarine habitat that is available to sustain staging smolts and returning adult spawners migrating through the Skeena Estuary.

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3. Eelgrass Habitat. Eelgrass supports high biodiversity of forage fish and plankton and represents an especially important near shore habitat for staging salmon smolts.

4. BC Parks Conservancies, Harbour Area. Within the estuary, harbour areas may experience relatively higher habitat pressures, and areas protected within BC Parks conservancies may experience lower habitat pressures.

5. BORSTAD Habitat Mapping. Estuaries contain a diversity of habitat types, each of which supports different assemblages of species. Maintaining a high diversity of productive estuary foreshore vegetation and healthy intertidal habitats is important for supporting a productive food base for staging salmon smolts.

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6. Current & Proposed Development: Harbour Development, Anchorages & Wind Power Tenures. Increasing development in the estuary has the potential to cause loss of salmon habitat directly through the footprint of associated infrastructure (e.g., wharfs, jetties, weirs, embankments, anchorages, etc.) or more indirectly through disruption of current patterns and sediment distribution. Continued activities (e.g., dredging, transport of goods) around development could also impact water quality through effects on water chemistry and potentially exposes fish to contaminants that could have lethal or sub lethal effects on salmon during periods of estuary residence. Alteration and/or loss of estuarine habitat through development tends to reduce the overall amount of useable habitat, and reduces the general productivity of estuaries (and food production), which can limit the overall utility of these areas for salmon.

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7. Climate Change Impacts. Estuarine habitats are considered to be sensitive to changes in physical and chemical conditions that may result from climate stressors like temperature change, acidification and UV exposure. Increases in UV levels, for example, have been shown to increase mortality of early fish life stages, while the combined effects of changes in SST and ocean acidity could cause shifts in fish distributions and community assemblages by depth and latitude.

Acknowledgements

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