

Gartner Lee Limited

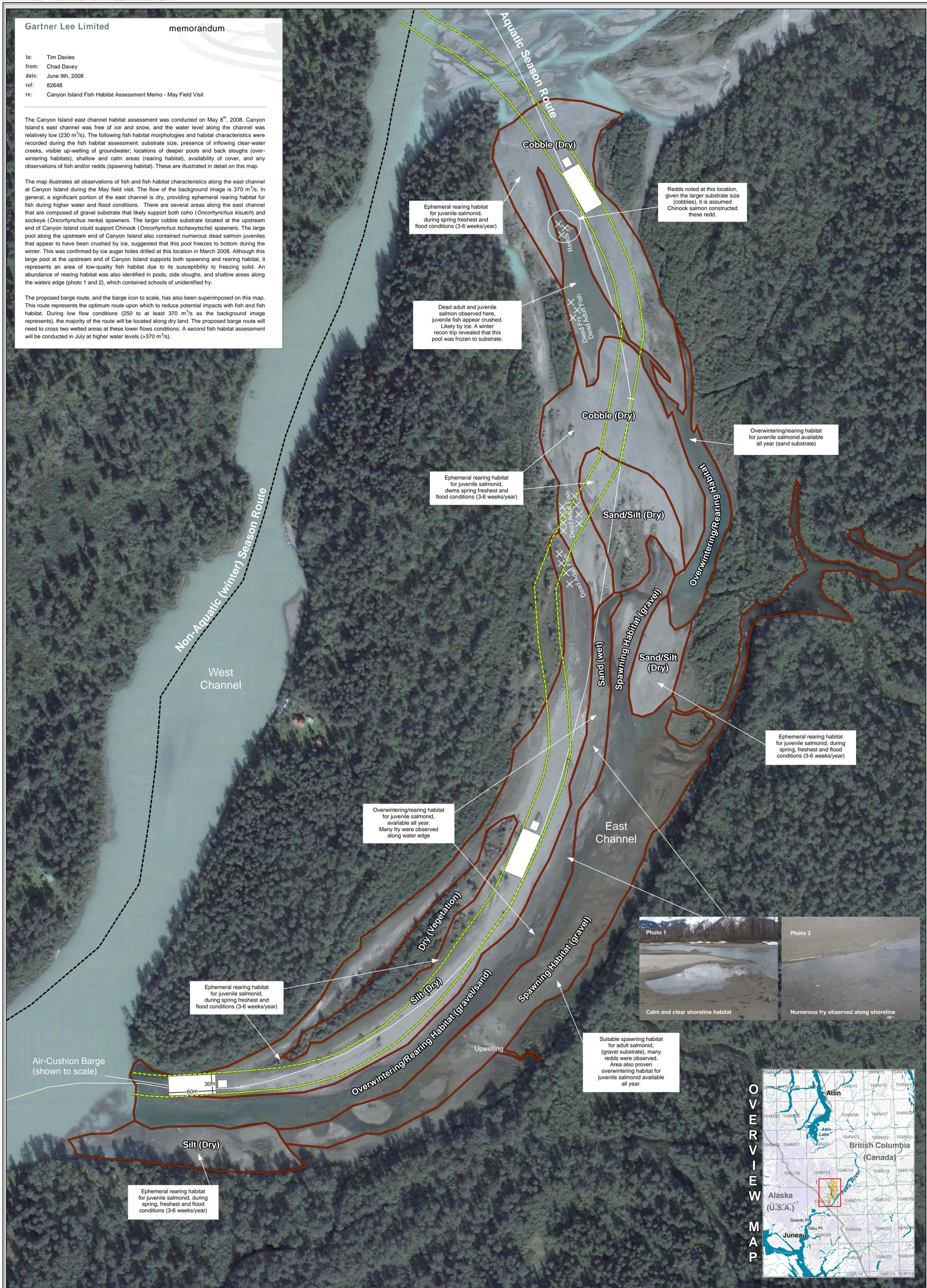
memorandum

to: Tim Davies
 from: Chad Davey
 date: June 9th, 2008
 ref: 82648
 re: Canyon Island Fish Habitat Assessment Memo - May Field Visit

The Canyon Island east channel habitat assessment was conducted on May 8th, 2008. Canyon Island's east channel was free of ice and snow, and the water level along the channel was relatively low (230 m³/s). The following fish habitat morphologies and habitat characteristics were recorded during the fish habitat assessment: substrate size, presence of inflowing clear-water creeks, visible up-welling of groundwater; locations of deeper pools and back sloughs (overwintering habitats), shallow and calm areas (rearing habitat), availability of cover, and any observations of fish and/or redds (spawning habitat). These are illustrated in detail on this map.

The map illustrates all observations of fish and fish habitat characteristics along the east channel at Canyon Island during the May field visit. The flow of the background image is 370 m³/s. In general, a significant portion of the east channel is dry, providing ephemeral rearing habitat for fish during higher water and flood conditions. There are several areas along the east channel that are composed of gravel substrate that likely support both coho (*Oncorhynchus kisutch*) and sockeye (*Oncorhynchus nerka*) spawners. The larger cobble substrate located at the upstream end of Canyon Island could support Chinook (*Oncorhynchus tshawytscha*) spawners. The large pool along the upstream end of Canyon Island also contained numerous dead salmon juveniles that appear to have been crushed by ice, suggested that this pool freezes to bottom during the winter. This was confirmed by ice auger holes drilled at this location in March 2008. Although this large pool at the upstream end of Canyon Island supports both spawning and rearing habitat, it represents an area of low-quality fish habitat due to its susceptibility to freezing solid. An abundance of rearing habitat was also identified in pools, side sloughs, and shallow areas along the waters edge (photo 1 and 2), which contained schools of unidentified fry.

The proposed barge route, and the barge icon to scale, has also been superimposed on this map. This route represents the optimum route upon which to reduce potential impacts with fish and fish habitat. During low flow conditions (250 to at least 370 m³/s as the background image represents), the majority of the route will be located along dry land. The proposed barge route will need to cross two wetted areas at these lower flows conditions. A second fish habitat assessment will be conducted in July at higher water levels (>370 m³/s).



Map Sources/Notes:
 UTM Zone 12N, NAD 83
 File Name: 82648_CanyonIsland_m_v6_11Sep2008
 Reviewed By: R4
 Date Issued: Sept 2008
 Project Number: 82648

CANYON ISLAND Fish Habitat Assessment

Legend
 - - - - - Proposed ACB Route

Flow of image is 370 m³/s
 Flow during assessment is 230 m³/s

Redfern Resources Ltd.
 Canyon Island Fish Habitat Assessment
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