

ASL Environmental Sciences (ASL) was chosen by Hemmera Envirochem Inc. and the Vancouver Fraser Port Authority (port authority) to perform a hydroacoustic study of eulachon fish (*Thaleichthys pacificus*) distribution in the vicinity of Deltaport Terminals off the mouth of the Fraser River, BC. To support the development of the Dredging and Sediment Discharge Plan that will form part of the Construction Environmental Management Plan of the Roberts Bank Terminal 2 Project (project), the port authority has committed to developing eulachon-specific mitigation that will be used during dredging activities. A pilot study was developed to examine the efficacy of hydroacoustic techniques in detecting adult eulachon.

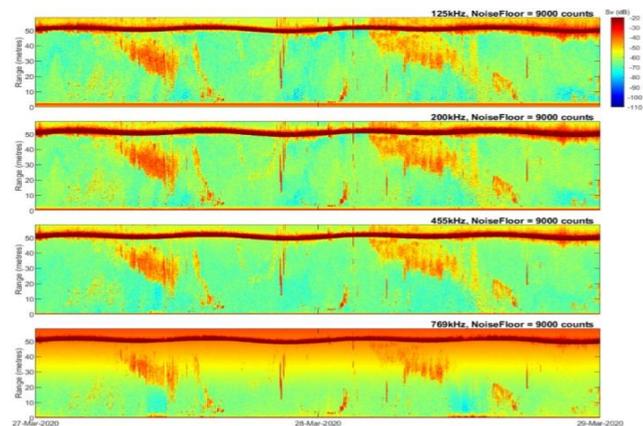
ASL proposed using the Acoustic Zooplankton Fish Profiler (AZFP), a calibrated multi-frequency echosounder, to measure distribution of the eulachon, particularly during the spring period when they are believed to migrate past Roberts Bank and up the Fraser River to spawn. The AZFP is a four-frequency acoustic profiler that can be deployed for months, continuously measuring day and night, or can be used in real-time transect mode. In the spring of 2020, three AZFPs were moored off Deltaport for six weeks, covering the peak April migration period. The acoustic profile data covered the water column down to 150 m depth at one shallow site and one deep site. The eulachon are known to occur near-bottom, but during migration may be present at shallower depths.

Eulachon can be differentiated from other fish species using multiple frequency acoustics (Gauthier and Horne, 2004) and estimates of aggregated abundance can be made (J. Horne 2020, pers. comm.). The figure below shows the typical acoustic signature of individual and aggregated fish schools.

This pilot study will allow the port authority to evaluate the effectiveness of monitoring eulachon distribution using multi-frequency echosounders. If the pilot study is successful, the port authority will consider how best to utilize the technology as eulachon-specific mitigation as part of the Dredging and Sediment Discharge Plan.



ASL's James Bartlett examining data after instrument recovery.



Four frequency AZFP data showing fish schooling and diel migration.