Uu-a-thluk
TAKING CARE OF

Emerging Research Technologies: The BioSonic DT-X Extreme Scientific Echo Sounder

By Sabrina Crowley, Southern Region Biologist, Uu-a-thluk and
Jared Dick, Central Region Biologist, Uu-a-thluk

The display of the BioSonic device actively sounding the water column.

Ha'oom Fisheries Society Byron Charlie and Jess Edwards scanning the water column with the BioSonics device to enumerate rockfish in Hesquiaht Harbour.

Pat Vek (DFO) and Dititdaht Fisheries Technicians Josh Tate and Paul Sieber Jr. installing the BioSonics device on the Hobiton River.

Assessing and monitoring aquatic resources can be challenging at times especially during changing environmental conditions. Uu-a-thluk and the Ha'oom Fisheries Society have started using new hydroacoustic technology to assess the resources that Nuu-chah-nulth communities rely on, such as rockfish and salmon. With the purchase of the BioSonics DT-X Echo Sounder equipment staff are able to increase their ability to assess resources and enhance their ability to monitor in changing environmental conditions.

"The BioSonics echo sounder is similar to the echo sounder commonly used on boats to detect fish and the depth below the vessel but it is much more powerful and advanced" says Jared Dick, Uu-a-thluk Central Region Fisheries Biologist. The Biosonics device emit sound waves from a transducer into the water and analyze the returning sound waves or echoes. The sound waves are transmitted at a very high frequency of 200 kilohertz (kHz) and can be sent deeper than 200 meters. As these acoustic waves travel through the water column they will bounce off fish or other marine animals and produce an echo. The echoes produced will change based on the composition and size of the object (fish, marine mammal or the bottom) which allows researchers some ability to determine what object made the echo. For example, an echo from a salmon will be a lot different than an echo from a sea lion and the machine and software is able to continually track and count these varying echoes.

Although the equipment can identify the different types of echoes produced by different fish, it is not at a fine enough resolution to determine which species of fish it's counting: especially when they're of a similar size. Therefore, a ground-truthing component must coincide with the sounding component where the fish being sounded are either captured or at the very least visually observed. For example, when the device is installed in a river counting outmigrating juvenile salmon, it can only tell you the number of fish swimming by. Fisheries staff must capture and determine the proportion of chum, coho and Chinook in the mix to produce the counts by species. If there are 1,000 juvenile salmon counted by the echosounder and your sampling determined that 1 out of 10 are Chinook, we would estimate that there were 100 Chinook that passed by the echosounder.

Monitoring Hobiton sockeye escapement is one such project that will benefit with the use of the BioSonics equipment. The Hobiton is a relatively small system and recent environmental conditions have made their adult sockeye enumeration operations challenging. Dititdaht First Nation and Uu-a-thluk have been using a fence in the Hobiton system for years (one of the earliest in 1982 in collaboration with DFO) and some of the challenges faced has been bear predation, high flows pushing the fence down, low flows preventing salmon passage through the fence along with high temperatures in-river increasing mortality. With the BioSonics equipment the transducer can be set up at the side of the bank pointing across the system to detect the number of sockeye swimming past to their spawning grounds. Not needing a fence to count the sockeye, reduces delayed migration and stress from the changing environmental conditions and predators.

Assessing the abundance of Yelloweye rockfish within the five Nations court defined fishing area using the BioSonics equipment was undertaken by the Ha'oom Fisheries Society. The five Nations' Yelloweye access is determined by DFO that manages Yelloweye at a coastwide scale. The abundance of Yelloweye in the smaller five Nations fishing area is not assessed. "DFO manages at a coast wide scale, and the Nations need to manage at their territory level or larger group of territories collectively" said Candace Picco, Ha'oom Fisheries Biologist and the scientist leading the Yelloweye project. Ha'oom's project addresses this knowledge gap by using the BioSonics on their boat and scanning downwards in areas where Yelloweye are known to congregate. The device detects and records the number of fish observed, but which species its encountering still has to be determined. Ha'oom plans to use a Remotely Operated Vehicle (ROV) to drive over these areas scanned by the BioSonics and visually identify the different rockfish species and their proportional abundance. The overarching goal of this project is to first assess the Yelloweye abundance and then develop sustainable harvest rates to ensure Yelloweye access for future generations.

Uu-a-thluk
P.O. Box 1383
Port Alberni, B.C.
V9Y 7M2

Ph: 250.724.5757
Fax: 250.724.2172
info@uuathluk.ca

www.uuathluk.ca