



L to R: Kayley Hollyer, Byron Charlie and Carilia Horning conduct eDNA field work as part of the sampling workshop that took place in November.

Photo: Joshua Blasman

Nuu-chah-nulth communities are one step closer to answering their own research questions about the health of fish species in their local waters following an environmental DNA (eDNA) sampling workshop that took place last month.

“It was a special event to organize and be a part of, because there was such a diversity of youth, biologists, Indigenous fisheries technicians, local organizations and DFO representative in the same room, learning and sharing,” said Julia Simmerling, Education Program Coordinator at Cedar Coast Field Station, and collaborator on the Microtrolling and Environmental (eDNA) Workshop.

The four-day workshop – which was designed and lead collaboratively by Cedar Coast Field Station Society, Maaqutusiis Hahoulthee Stewardship Society, Ha’oom Fisheries Society, Uu-a-thluk, and the DFO Molecular Genetics lab – took place from November 4-7 at Tofino Resort + Marina.

It was the result of a discussion that was initiated by Dr. Kristi Miller-Saunders’ (head of genetics research at DFO) presentation on the technology six months earlier, at a meeting of the Uu-a-thluk Joint Technical Working Group.

Inexpensive and convenient, eDNA sampling technology provides scientists, and now Nuu-chah-nulth Nation fisheries technicians and managers, a quick method for identifying fish, plants, mammals and microbial communities in an area. It assists in understanding the presence of invasive species, the detection of infectious agents and the identification of predators that would otherwise be challenging to track (marine and terrestrial mammals, birds and sharks).

This is done through the analysis of free DNA (skin, waste, scales) that fish and other species leave behind as they pass through water and travel on land.

A total of 41 people attended the Microtrolling and eDNA Workshop, which saw representation from eight Nuu-chah-nulth Nations. Seventeen of the 41 were coastal youth (aged 18-30) registered for the eDNA workshop, and of the 17, eight youth identified as Indigenous, including two from Nuu-chah-nulth Nations.

“Having training opportunities for Nuu-chah-nulth-aht means we can help

build capacity within the region and add to the resilience of the communities here,” said Mack Bartlett, Director of Research at Cedar Coast Field Station.

Funding for the eDNA workshop was provided by Students on Ice Foundation’s Blue Futures Pathway Project which aims to connect youth across Canada – especially under-represented, remotely located and Indigenous People – with education and employment, and to support them in developing a successful career in the sustainable blue economy.

Through a combination of in-class learning and field work led by DFO’s Dr. Kristi Miller-Saunders, Dr. Christoph Deeg and Rob Saunders, participants learned how to conduct eDNA water collection and filtration for species and disease-causing agent detection.

By the afternoon of day two, youth were already practicing eDNA sampling off Tofino Resort + Marina’s dock, as well as on nearby boats. Day three saw participants sampling in Tofino Inlet for most of the day, while the final day included a real-time sample analysis demonstration using a portable quantitative PCR (qPCR) instrument, followed by the sharing of analysis results.

“Participating in the eDNA and microtrolling workshop not only gave me hands-on experience with novel fisheries monitoring techniques ... but also helped give me a better picture of the many interconnected projects currently monitoring salmon on the west coast of Vancouver Island,” said Carilia Horning, workshop participant.

Participants were encouraged to explore their own research questions during the sampling exercises. One group was curious to investigate whether there was more rockfish eDNA in a Rockfish Conservation Area (RCA) compared to outside the RCA.

The practical application of the eDNA sampling technology holds a lot of potential for First Nations.

“... An easy application is figuring out the far field impacts of fish farm, hatchery and sewage outfall pathogens; how far away from a source are we detecting effluent, is it half a kilometer, two kilometers?” said Jared Dick, Uu-a-thluk Central Region Biologist.

Nuu-chah-nulth-aht interested in the prospect of gaining eDNA sampling skills either to boost their employability or to address their nation’s needs are in luck.

Uu-a-thluk Fisheries has secured funding from the AAROM Innovation and Collaboration Fund to support the purchase of eDNA sample systems and the development of training videos for Nuu-chah-nulth Nations.

“Creating our own training resources provides increased opportunities for nations’ fisheries staff,” said Jim Lane, Deputy Program Manager for Uu-a-thluk.

“Having the sampling equipment allows the nations to work with us to develop eDNA monitoring programs at reduced costs and increases the flexibility we have to use eDNA sampling to support the nations’ fishery resource monitoring interests.”



Environmental DNA (eDNA) sampling will assist Nuu-chah-nulth Nations’ fisheries departments in detecting the presence of species like łusmit (herring) in their local waters.