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Boundaries An Interview with Kieran Cox

Interview by Natalie Sopinka | AFS Contributing Writer

Photographer: Kieran Cox, Hakai Scholar and M.Sc. Candidate, University of Victoria. E-mail: kcox@uvic.ca

Location: 10 Mile Point, Victoria, BC, Canada.



What species of fish are we looking at?

This is a Smoothhead Sculpin *Artemius lateralis*. Sculpins are known to have a lot of pattern variability, so it wasn't clear at first whether this individual was a Smoothhead, but with the help of marine expert Andy Lamb, we were able to work through the ID features and confirm my initial observations.

Smoothheads are just one of the 350 different species of sculpins found globally, 40 of which can be seen while diving in the Pacific Northwest. The term "sculpin" is not a classification on its own but instead references any fish that is a member of the Cottidae family. With the recent reclassification of a number of species, sculpins now also include members of the Rhamphocottidae family (e.g., Grunt Sculpin *Rhamphocottus*

richardsonii), the Hemitripterae family (e.g., Sailfin Sculpin *Nautichthys oculoasciatus* and Silverspotted Sculpin *Blepsias cirrhosus*), and the Psychrolutidae family (e.g., Spinyhead Sculpin *Dasycottus setiger* and Blackfin Sculpin *Malacocottus kincaidii*). It is a diverse and highly variable group, making it a favorite among both divers and ichthyologists.

Is this fish completely out of water?

Not quite, but this individual is living about as close to the interface as fish species get, about 4–6 inches below the water level. Given the exposed coastline and surface conditions, it was likely exposed when large waves receded. This particular species of sculpin is known for its shallow habitat range and is

not typically found below 15 m (50 ft), but I've never seen one this close to the surface on such an exposed coast.

How did you happen upon this intrepid sculpin?

My dive partner, Tom Reimchen, who has been diving in the Pacific Northwest for quite some time now, spotted it as we were exiting the waters. Reimchen has a keen eye for interesting cryptic species and, as it often does, it really paid off when he found this particular specimen in the shallows. Initially, neither of us was sure what species it was, because being wedged between rocks but very exposed is not a common place to find many intertidal fishes. Needless to say, I was glad my photo turned out so well; it was what made identifying the specimen possible.

How often do you dive in these waters?

My diving in the Pacific Northwest started in 2011 when I moved to Victoria, British Columbia, to start my undergraduate degree at the University of Victoria. Over the past 6 years, I've been fortunate enough to complete over 300 dives around Vancouver Island, many of which were through my involvement with the University of Victoria Scuba Club while acting as the club's dive coordinator and divemaster. I've also been able to complete an additional 300 warmwater dives while working for Operation Wallacea, a conservation and research organization in both Indonesia and Honduras, as well as during my work for Julia Baum as a scientific diver on Christmas Island (Kiribati). Victoria has been the perfect environment for me to develop my skills as both a diver and a marine biologist.

This particular photo was taken at 10 Mile Point in Victoria, which is one of the best shore dive sites around Southern Vancouver Island. I currently have over 50 dives at 10 Mile and am setting the goal of diving there at least 30 times per year throughout my graduate degree.

What's the biggest challenge photographing during dives in the Pacific Northwest?

That is a great question. I'm sure it varies depending on the photographer, but for me personally it has to be the equipment and the conditions. Although teeming with life, the Pacific Northwest can have low visibility, strong currents, and quite frigid waters. To help divers deal with these potentially harsh conditions, we dive in drysuits, which require additional weight to allow us to become neutrally buoyant. An average diver may need over 75 lb. worth of equipment just to enter the water, which can make navigating a rocky intertidal dive site, after a 65-min dive with a camera, bulky housing, and multiple strobes (lights), a little tricky to say the least.

That said, the Pacific Northwest is one of my favorite places in the world to dive. I'll take a great slack tide at 10 Mile Point or diving with sea lions on Hornby Island over a tropical reef any day. You just can't beat the raw intensity of the Pacific Northwest. You and your buddy might be the only people in the water for miles and get to experience a face-to-face encounter with an 8-foot-long giant Pacific octopus *Enteroctopus dofleini*; it's a really amazing place to dive.

What does your M.Sc. research entail?

As a Hakai Scholar, under the supervision of Sarah Dudas (Canada Research Chair in Shellfish Aquaculture Ecosystem Interactions, Vancouver Island University), I am involved in an ongoing collaboration with the Hakai Institute. This last



Pacific Oysters at a shellfish farm in Baynes Sound, British Columbia. Photo credit: Kieran Cox.

summer we assessed 24 intertidal sites within three coastal regions, focusing on several beach types, including First Nations clam gardens and current shellfish farms. We observed over 200 intertidal species throughout our study regions, the vast majority of which are found on Quadra Island. Quadra Island has amazing species diversity. Our research goal is to determine what marine species are within these areas and how they respond to these habitat changes. It was an amazing summer and resulted in a really high-quality assessment. None of this research or my graduate degree would be possible without the support of the Hakai Institute.

What is the history of shellfish aquaculture in your study sites?

My graduate research involves two very distinct study sites, contemporary shellfish aquaculture and traditional First Nation clam gardens. This means that some of our sites were constructed over a thousand years ago and some of them were constructed within the last few decades. First Nation clam gardens, which are incredible structures, were constructed by moving large amounts of rocks into the low intertidal, stabilizing sediments, and increasing the amount of potential clam habitat. These gardens could then be maintained and harvested. Contemporary shellfish aquaculture involves various practices like predator exclusion nets, oyster seeding, fence building, and the hanging of cages of shellfish, commonly called "rafts," subtidally. Studying both of these methods has been an incredible experience because there is so much cultural significance and global importance surrounding both practices; I really couldn't have asked for a better topic.

Are sculpins a species sensitive to shellfish aquaculture?

The short answer is I don't know, but I hope to find out during my M.Sc. If I had to guess, I would say that certain species may be affected but, in general, shellfish aquaculture creates more three-dimensional space for species to live and hide within, so the response could actually be that as the number of shellfish structures increases, so too does the number of sculpins found in an area. Again, this is just a guess; you'll have to check back in later when we have concluded our shellfish raft assessments. [AFS](#)