

The use of Environmental DNA to assess the timing and movement of out-migrating Coho Salmon (*Oncorhynchus kisutch*) in the Prairie Creek sub-basin.

Emerson Kanawi joined the California Cooperative Fish and Wildlife Research Unit in the fall of 2017. Before his graduate studies, Emerson worked in various systems across the western US conducting environmental fieldwork. During his undergraduate studies at California State University, Sacramento (CSUS), Emerson worked alongside the Field Biology Group at CSUS to conduct an aquatic vegetation survey of Rancho Seco Aquatic Park and to survey wild bee populations in the Crystal Basin area of the Sierra Nevada mountain range. After completing his degree, Emerson worked as a technician in Arizona with Dr. John Sabo of Arizona State University on research relating water as a limiting resource to terrestrial invertebrate food-web dynamics within the San Pedro River riparian corridor. He then took a position with the California Environmental Protection Agency and UC Davis assessing pesticide concentrations in storm-water runoff throughout California. In 2013, Emerson worked with Great Basin Institute to analyze allotment renewal permits for the Bureau of Land Management based on soil and vegetation surveys in Northwestern Nevada. After this experience, Emerson realized his passion for freshwater ecosystems and worked as a contractor of UC Santa Cruz on a life-cycle monitoring station for Coho Salmon with a research team based at the NOAA Southwest Fisheries Science Center in Santa Cruz, CA. For the next four years, Emerson helped to coordinate data collection procedures in the field and in the lab, maintained database systems in the office, and designed, constructed, and maintained a network of Passive Integrated Transponder antenna arrays.



As a student under Dr. Mark Henderson in the California Cooperative Fish and Wildlife Research Unit, Emerson will be assessing the distribution, timing, and abundance of Coho Salmon in the Prairie Creek drainage, an old-growth redwood dominated tributary of Redwood Creek outside of Orick, CA. His research will involve the use of environmental DNA present in the water column to monitor the movement of out-migrating Coho smolts during the spring and to assess the possibility of using genetic analysis to monitor and quantify the abundance of fish moving to the ocean. Previous research has established the use of eDNA as a tool to monitor the presence or absence of rare, elusive, and invasive species. Specifically, research has shown it as a viable option for the monitoring of freshwater fish species in a range of lotic and lentic systems. Using a traditional out-migrant monitoring technique (Rotary Screw Trap) Emerson will compare these two methods to each other and assess the quality of information that can be attained using eDNA. Environmental DNA may provide a low-cost, high-resolution tool to fisheries managers in systems that lack the funding, infrastructure, or access that is inherent in traditional fish monitoring programs.