HOBO® by Onset®

Use Case:
Prioritizing River Restoration for Chinook Salmon

Problem

Diversion of water for irrigation and other uses, along with the construction of levees to prevent flooding of urban and agricultural areas, has significantly impacted California's Sacramento River. These actions have brought about changes to the natural flow regime in the Sacramento River Valley that appear to be contributing to the decline of the native Chinook salmon population there.

A researcher with the University of California, Davis received a grant to study food webs in various Sacramento River Valley ecosystems (the river, the adjacent floodplain wetlands, and drainage canals in the floodplain) to identify the most important factors for supporting healthy salmon growth and prioritize river restoration efforts.

Although many significant water quality parameters for the study could be measured with handheld instruments and subsequent lab analysis of the water samples, the researcher determined that the continuous measurement of dissolved oxygen (DO) levels would be very important to the study, so he reached out to Onset for a convenient and cost-effective solution.

Solution

Onset recommended the cost-effective, easy-to-maintain HOBO U26 Dissolved Oxygen data logger for continuous measuring and recording of DO and water temperature at 15-minute intervals over the course of the 23-day study. With the U26's affordable price, the research team was able to purchase multiple loggers to monitor numerous locations simultaneously.

The HOBO Waterproof Data Shuttle made it convenient for the team to download data, without having to take a computer into the field. And Onset's HOBOware Pro software facilitated simple export of DO and temperature data to be imported into the USGS-R/streamMetabolizer modeling package for calculation of key stream metabolism parameters: gross primary productivity (GPP), ecosystem respiration (ER), and net ecosystem productivity (NEP). The U26's user-replaceable DO sensor caps, which last up to six months, made it easy to maintain the loggers and their measurement accuracy, without having to send them back to the factory for servicing.

Read results on reverse

Results

Data from the HOBO U26 loggers showed water temperatures to be higher on average and DO levels more variable and slightly lower on average in the floodplain wetland, where zooplankton density correlated to a five times faster growth rate than that seen in salmon raised in the river habitat.

With the knowledge gained from the study, the research team can make informed decisions on ideal locations and best approaches for river restoration that supports the recovery of the Chinook salmon population.

> *The HOBO Waterproof Shuttle made it very easy to offload the HOBO loggers at the research sites, and data export was nearly effortless with HOBOware Pro software.*
>
> *– Eric H., UC Davis researcher*

Products Used

Product	How it was used
HOBO U26-001 Dissolved Oxygen Data Logger	To measure and record dissolved oxygen and water temperature
HOBO Waterproof Shuttle	To offload dissolved oxygen and water temperature data from loggers in the field
HOBOware Pro Software	To offload loggers and/or shuttles, and graph, analyze, and export data

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