Caloosahatchee River's movable feast studied

BY KEVIN LOLLAR • KLOLLAR@NEWS-PRESS.COM • SEPTEMBER 26, 2008

Researchers aboard two boats on the wind-whipped Caloosahatchee River used high- and low-tech gear Wednesday night to find a moveable feast.

Specifically, faculty, graduate students and an undergrad from Florida Gulf Coast University and the University of South Florida were looking for areas where juvenile fish feed and move with inflow of fresh water.

The yearlong collaboration financed by $191,600 from the U.S. Department of Education and $50,000 from the South Florida Water Management District, might affect management policies for the river.

"We all know the value of fixed habitats like oyster reefs and seagrass beds for organisms' food and shelter," said Greg Tolley, FGCU professor of marine science. "There are other types of habitats that move up and down the river. We're trying to figure out where these habitats are under different conditions and what contributions they make to the fisheries of Southwest Florida."

One of those moving habitats, sometimes referred to as "the secret garden," is a combination of algae growing on the bottom and phytoplankton sinking out of the water column. Phytoplankton are floating microscopic plants. Zooplankton are floating microscopic animals.

A number of bottom-dwelling organisms feed on the algae and phytoplankton, and juvenile fish eat the bottom-dwellers.

These moving areas are important to "estuary dependent" fish.

"Estuary-dependent organisms are impatient: Instead of waiting for the food to come to them, they move upstream to head it off at the pass," Tolley said.

"If you're impatient, you ride the tide to where the food is, and you grow quicker. The quicker you get bigger than the mouth that wants to eat you, the better off you're going to be."

Among the larval fish that move upstream are snook, redfish, trout and bay anchovies, a food source for other fish species.

Another area of moveable food is the "estuarine turbidity maximum," a zone of increased turbidity, or lack of clarity caused by suspended matter, where zooplankton, an important part of the food web, hide from predators.

"I'm interested in the biological significance of the ETM," FGCU graduate student Brooke Denkert said.

"With all the fresh water coming into the river, I'm interested in what that community is doing."

Of course, these habitats move in the Caloosahatchee with normal tides and natural changes in salinity, but they also move with releases from Lake Okeechobee, so researchers want to find out how each of these variables affects the habitats - the project started in May, at the end of the dry season, and will continue through the wet season and next dry season.

To find out, they've divided the river into seven zones, from Point Ybel to the W.P. Franklin Lock and Dam, with two sampling stations in each zone, and take samples two nights each month.

Brooke Denkert, a graduate student at Florida Gulf Coast University sprays a net to gather plankton as part of a research project to determine how fresh water inflow to the Caloosahatchee River affects certain organisms. (Andrew West/news-press.com)

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Aboard the team's 25-foot Sea Hawk Wednesday were Tolley, FGCU graduate students Rachel Harris and Megan Andersen and USF grad students Greg Ellis and Kara Radabaugh; aboard a 20-foot Parker were Denkert, FGCU undergrad intern Travis Brindise and Michael Parsons, FGCU associate professor of phytoplankton ecology.

"The neat thing is a lot of times people who do phytoplankton just look at the phytoplankton," Parsons said. "Here we're looking at phytoplankton and zooplankton. We're also doing benthics and other factors to get a sense of what physical processes are going on."

Aboard the Parker, the team's responsibility is plankton: Denkert is in charge of zooplankton, and Parson takes the phytoplankton net.

The Sea Hawk team's gear was a little more high-tech than plankton nets, including:

• A Pulse Amplitude Modulation fluorometer, which targets chlorophyll in phytoplankton and can tell how fast the organisms are growing.

• A Laser In Situ Scattering and Transmissometer, which calculates the number and size of particles in the water and how fast they sink.

Eventually, data from this project could influence how much fresh water is released down the Caloosahatchee and when, water district scientist Peter Doering said.

"This is one of those projects that I'm really excited about," he said.

"In the '70s, some people discovered a relationship between the amount of fresh water released one year down the St. Lawrence River and the lobster harvest a couple of years down the road.

"There's something going on with the freshwater flow and production in an estuary. But the picture is muddled. This work is getting at how this estuary works, and it will give us information about when to let more water out and when to try to hit specific freshwater targets."