

SEA GRANT NEWS

“Science Serving California’s Coast”

***IN
THIS
ISSUE...***



- **Former Sea Grant Trainee at NOAA Research Reserve**
- **Lucky Crab Fisherman Wins \$3,000 in Tag Lottery**
- **Sea Grant Extension Publishes Fisheries Newsletter**
- **Extension Program Field Day on Nontoxic Hull Paint**

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Cover: Fred Greaves—San Diego marina;
this page (upper): Jamie Anne Miller—worker applying nontoxic hull paint;
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Where Are They Now? Former Sea Grant Trainee at NOAA Research Reserve

Six years since earning his doctorate in invasive species ecology, former Sea Grant trainee Jeff Crooks is now the research coordinator at the Tijuana River National Estuarine Research Reserve, a position that melds his interests of science, conservation and wildlife restoration in urban areas.

The reserve, one of 26 NOAA-supported research reserves in the country, occupies about 2,500 acres along the banks of the Tijuana River and its estuary, and protects some of the largest tracts of undeveloped coastal wetlands in the sprawling Tijuana-San Diego region. Although the reserve is entirely within the boundaries of the United States, about two-thirds

of the watershed draining the Tijuana River is in Mexico.

“These wetlands are the sort of habitats we need to protect,” Crooks said. “The reserve is a green wedge between San Diego and Tijuana. If you lose places like this, it would pretty much be solid city from here to Camp Pendleton. I am very interested in protecting these green pockets from the urban ‘sea’.”

Crooks received his doctoral degree from Scripps Institution of Oceanography in La Jolla in 1998 under the mentorship of professor Lisa Levin. As a Sea Grant trainee, he characterized the effects of a mat-forming Asian mussel and a burrowing Australian isopod on natural and

restored wetlands in San Diego and San Francisco. The research was novel because it emphasized the ability of even small non-native invertebrates to transform entire landscapes—by eroding marsh banks, for example, or by converting sand flats to mud. Traditional studies of exotic species ecology, Crooks explained, typically focus on the effects of exotics on food-web dynamics and predator-prey relationships. The idea that exotics can also alter physical environments adds a new dimension to the environmental perils of continued non-native species invasions.

After graduating, Crooks continued his studies of exotic species ecology at the Smithsonian Environmental Research



The Tijuana River National Estuarine Research Reserve extends all the way to the U.S.-Mexico border, delineated here by an old, rickety, wooden fence. All photos for this article: Christina S. Johnson, California Sea Grant

Continued p. 4

Sea Grant Trainee (continued)

Center in Maryland; and just prior to returning to San Diego in 2002, he helped establish a West Coast Smithsonian research center in San Francisco.

In his current position, Crooks is revisiting invasive species questions he explored while a Sea Grant trainee: What are the effects of non-native species on the physical characteristics of marsh habitats? What are the biological implications of these physical changes? To what degree can highly disturbed habitats be restored or recreated?

The Tijuana River reserve, like most, if not all, wetland areas in Southern California, is infested with non-native plants. One in particular, an Asian tree called tamarisk, is devouring habitats that support rare and endangered birds. “Tamarisk is turning salt marsh into tamarisk forests,” Crooks said. None of the native marsh vegetation grows much taller than knee-high. Tamarisk and other invasive plants, such as the cane-like *Arundo donax*, grow as tall as small buildings, elbowing out native plants that are food, shelter and breeding areas for birds and other animals. Biologists fear tamarisk may also intensify predation by hawks and other raptors who use the uncharacteristically tall vegetation as sentry towers for scouting prey.

To prevent further losses to wildlife, the California Coastal Conservancy and the U.S. Fish and Wildlife Service are supporting a tamarisk eradication program at the reserve. In addition, California Sea Grant recently awarded funding for



Arundo donax is a towering invasive plant that may be almost impossible to remove permanently.



Castor bean (*Ricinus communis*) is another troublesome and ubiquitous exotic plant.



Reserve Research Coordinator Jeff Crooks points to tamarisk growing along the banks of the Tijuana River.

a project to evaluate the effectiveness of this eradication effort. The project’s lead investigator is Drew Talley, another former Sea Grant Trainee and former student of Lisa

Levin. Talley is now a biologist at the University of California at Davis. Crooks and Levin are co-investigators on the grant.

Besides assessing the effective-

Continued p. 5



Tamarisk displaces native coastal marsh plants such as the rare spiny bulrush (upper) and pickleweed (right) in which the Belding's Savannah sparrow nests.



(Below) Wetlands at NOAA's Tijuana River National Estuarine Research Reserve provide important foraging, breeding and resting areas for birds such as snowy egrets.



ness of the tamarisk eradication plan, Crooks wants to learn more about what he sees as the most scientifically intriguing aspect of the tamarisk invasion—the tree's apparent ability to grow in salt marsh. Tamarisk is known for invading riparian habitats, not salt

marsh. "As far as I know, this is the first time anybody has seen dense stands of tamarisk in salt marsh," he said. Understanding why tamarisk has been able to expand its range will shed light on the changing ecology of the urban reserve.



Lucky Crab Fisherman Wins \$3,000 in Tag Lottery

The latest winner of the "lucky tag" drawing in Humboldt State University's three-year Dungeness Crab Tagging Project is Larry Evanow, a Eureka crab fisherman. Evanow received the prize in November from David Hankin, professor and chair of the Department of Fisheries Biology, following a drawing at Englund Marine Supply in Eureka.



Professor David Hankin of Humboldt State University presenting \$3,000 award to Eureka fisherman Larry Evanow. Photo: Humboldt State University

The Dungeness Crab Tagging Project, funded by California Sea Grant, collects data on the natural mortality rates and movements of male Dungeness crabs. Some 8,300 crabs have been tagged so far. To encourage voluntary return of tags, fishermen receive compensation for all those returned. As an additional incentive, a single tag is drawn from those collected during the season and the fisherman awarded \$3,000. ■ ■ ■

Sea Grant Extension Publishes Fisheries Newsletter

To better serve those interested in marine fisheries, the California Sea Grant Extension Program is now publishing a four-page newsletter, *Sea Grant Fisheries*.

Marine Fisheries Specialist Christopher Dewees and Bill Leet are editors of the quarterly newsletter, published with support from the National Sea Grant Extension Program's fisheries extension initiative and the University of California Division of Agriculture and Natural Resources.

"We think *Sea Grant Fisheries* will strengthen our contact with the coastal fisheries community and provide information that they might not get elsewhere," Dewees said.

A recent issue discussed the new trawl buyback program and a collaborative research project with fishermen to study juvenile rockfish. Upcoming issues will include articles on lingcod, Dungeness crab and marine protected areas. ■ ■ ■



Fishing trawler. Photo: Richard M. Starr



If you are interested in a free subscription to the quarterly *Sea Grant Fisheries* newsletter, either digitally or by regular mail, please contact Janelle Kohl at jmkohl@ucdavis.edu or phone her at 530-752-5797 (mornings). The newsletter can also be read online by selecting the link on the California Sea Grant web site homepage: <http://www.csgc.ucsd.edu/>



Vermillion rockfish (*Sebastes miniatus*). Photo: Donna Schroeder

Extension Program Leads Field Day on Nontoxic Hull Paint

Beneath the surface of San Diego Bay, thousands of recreational boat hulls are slowly leaching toxic cuprous oxide into the water.

For decades, boaters have relied on paints high in copper to protect their hulls from fouling by barnacles, algae and tubeworms. As San Diego has grown, so have copper levels in the bay, to the point where copper poses environmental threats to marine life. Local governments may soon be faced with high costs of removing copper from coastal waters and sediments to meet water-quality standards. It is also possible that boaters one day may be restricted in their use of copper hull paints.

To prepare coastal communities for potentially stricter water-quality regulations, California Sea Grant Marine Advisor Leigh Taylor Johnson has been educating the boating community about nontoxic alternatives to copper paints. In September, Johnson and Program Representative Jamie Anne Miller of California Sea Grant Extension Program completed a one-year demonstration of the performance and maintenance of boats coated with nontoxic paints. The project was funded in part by the U.S. Environmental Protection Agency and the California State Water Resources Control Board.

“We learned that different types of boats need different types of nontoxic paints,” Miller said. “The performance of a paint depends on how often someone uses their boat



Sea Grant Marine Advisor Leigh Johnson (left) hosting field day at Shelter Island Boatyard. Photo: Jamie Anne Miller



Project participants inspect the nontoxic hull coating on the *Nina K.* Photo: Bobby Koga

and how fast their boat goes. There are many variables. There is not one nontoxic paint for all boats. We learned that different nontoxic paints are better in certain circumstances.” This type of information is crucial for boaters who will bear the cost of switching paints.

Last October, Johnson and Miller hosted a field day for the boating community at Shelter Island Boatyard, where attendees could see and ask questions about nontoxic paints. The event drew

more than 80 people from the boating industry, environmental groups and government agencies

Eighty-two percent of attendees who responded to a questionnaire said the event had increased their interest in trying nontoxic bottom paints.

Johnson and Miller have published a new booklet for the boating public, “Making Dollars and Sense of Nontoxic Antifouling Strategies for Boats.” (See p. 8 for ordering information.) ■ ■ ■

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*****NEW CALIFORNIA SEA GRANT PUBLICATION*****

Making Dollars and Sense of Nontoxic Antifouling Strategies for Boats

by Leigh Taylor Johnson and Jamie Anne Miller, Sea Grant Extension Program

This 12-page booklet includes:

- Environmental effects of copper pollution from boat bottom paints
- U.S. and European regulatory policies
- Antifouling strategies vs. antifouling paints
- Research on boater attitudes and the economics of copper vs. nontoxic antifouling strategies
- Policy options to encourage boat owners to use nontoxic boat bottom paints
- Worksheet to compare boat owner's cost to use copper-based and nontoxic boat bottom paints

Information intended for:

- Boat owners, repair and maintenance businesses
- Marina, yacht club, port and harbor managers
- Government and regulatory agencies and policy makers
- Marine and environmental organizations

Pub. No. T-052 The publication is free. To request one or more copies contact: Gretchen Frederick gfrederick.ucsd.edu, 858-534-4446, or write Communications Department, California Sea Grant, 9500 Gilman Drive, La Jolla, CA 92093-0232.

