Sea Grant California

Sea Grant Fisheries

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INSIDE STORIES:

Rapid Fish Die-off in Malibu Creek

By Sabrina Drill
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Malibu Creek in Los Angeles County is home to one of the southernmost reproducing populations of the endangered southern steelhead trout (*Onchorhynchus mykiss*). Located in arid southern California, this stream typically offers access to the ocean only during the winter. Adults entering the stream from the ocean are also limited by the 100 feet high Rindge Dam, restricting these fish to the lowest two miles out of more than 70 miles of what was historically steelhead habitat. Over the past decade, several groups have been trying to restore access to upstream spawning habitat by removing the dam, which no longer operates.

Since June 2005, the Resource Conservation District of the Santa Monica Mountains has conducted monthly snorkel surveys. In May 2006, we recorded the highest numbers of steelhead in Malibu Creek since the surveys began, 245 steelhead including more than 70 young-of-the year trout. However, in July 2006, we observed a yellow color variation in a few otherwise healthy small (< 15 cm) juvenile trout. The next month, yellow trout of all sizes were observed, and appeared stressed or sick, swimming sluggishly with mouths agape. In September, only nine steelhead trout were counted in Malibu Creek; other species including crayfish, carp, and catfish, while not yellow, had declined in number and showed symptoms of illness. By November 2006, no fishes at all were found in Malibu Creek.

What caused these fish to turn yellow and die? We measured physical environmental conditions, checked bacterial and algal communities, and searched for evidence of toxic pollutants. Air temperatures in the summer of 2006 were very warm, but water temperature and dissolved oxygen levels were within the normal range and water flow was continuous. While high nutrient levels were observed, these were comparable to levels documented during previous years, and no toxic pollutants were found. A pathological examination of three trout collected in September found trematodes, anchorworms and dermal bacteria, but these were not considered out of the ordinary. During our snorkel surveys, we noticed the presence of a strange black muck, often covered with a white lacing, but this "Malibu muck" turned out to consist of diatoms and bacteria commonly found in freshwater streams, with no biotoxin-producing organisms present.

Healthy (left) and sick (right) juvenile steelhead.

Credit: Rosi Dagit

Since the kill, 11 adult steelhead have returned to Malibu Creek. However no young-of-the-year or juveniles have been observed and the "Malibu muck" has re-appeared. The adults have not developed the yellow coloration, but continued efforts are needed to monitor the new population and to determine the cause of an isolated event we hope will remain known as "the big 2006 die-off."

For more information, or if you have ever observed a similar yellow coloration in natural trout populations, please contact Sabrina Drill at sldrill@ucdavis.edu or Rosi Dagit, Senior Conservation Biologist at the RCD of the Santa Monica Mountains at oaksrus@mac.com.

American Fisheries Society Symposium On Implementing Ecosystem-Based Management In Fisheries

Carrie Pomeroy
Marine Advisor, Santa Cruz & Monterey Counties

On September 6, 2007, Sea Grant and the American Fisheries Society (AFS) Socio-Economic Section are co-sponsoring a one-day symposium at the 137th annual meeting of the AFS in San Francisco. "Tangled Roles, Logjams and Snarled Nets: How to Implement Integrated Ecosystem-Based Management in Fisheries" will include keynote presentations, contributed papers and posters that address the diverse aspects and challenges of implementing ecosystem-based management. Symposium presentations will address three themes: People & Fisheries Ecosystems, Best Practices in Integrated Management, and Filling Information and Program Integration Gaps. Keynotes include:

Courtland Smith (Oregon State University): Cultivating Capture Fisheries: Learning from Ten Millennia of Cultures Adapting to Pacific Coastal Marine Ecosystems

David Fluharty (University of Washington): Efforts to Implement Best Management Practices in NOAA and Other Federal Agencies in the US: An Independent Critique.

Christopher Glass (University of New Hampshire). Filling Information Gaps and Promoting Integration for Ecosystem-Based Fisheries Management

For more information, please go to http://web.fisheries.org/sf/ or contact the symposium co-chairs:

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University Of Washington Hosts Symposium On Temperate Reef Fisheries

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Natural resources associated with temperate reefs offer a unique set of challenges to fishers and managers, as well as to scientists studying reef ecology. Scientists from the University of Washington in Seattle convened a symposium titled, "Managing Temperate Reef Resources, June 7 and 8, 2007, to explore these challenges and discuss possible solutions. The meeting focused on West coast fisheries from California, Oregon and Washington, drawing experts from these states but also from Canada, Australia and Argentina where similar fisheries occur.

Speakers at the symposium reviewed key issues: scale, stock structure, life history attributes and fishery management tools (e.g. bag limits). There was broad agreement regarding the importance of managing at finer spatial scales, but participants expressed concern over critical data gaps and the challenge of fine-tuning local management efforts within the current complex of federal, state and regional regulatory agencies. Representatives from British Columbia, Washington, Oregon and California provided summaries of the status of nearshore fisheries management in their region. Despite differences among them, all reported an increasingly influential recreational fishery and substantial harvest reductions.

Near the close of the symposium, a panel was tasked with identifying the key first steps towards improving management of temperate reef fisheries. Panel members agreed that involving all interested parties in every stage of the management process was crucial—from setting clear goals to data collection to formulating policy to enforcement. In addition, members emphasized the importance of alternatives to traditional management tools, including the use of no-take reserves.

The symposium agenda is available at depts.washington.edu/reefsymp/index.html.

Mike Zamboni, commercial fisherman with a vermillion rockfish (*Sebastes miniatus*) from Humboldt County.

Credit: Peter Nelson

Olfaction and Homing In A Rockfish

Peter Nelson
Marine Advisor, Del Norte & Humboldt Counties

Recent research by Japanese scientists has shown that an Asian species of rockfish, *Sebastes inermis*, shows a strong homing response[1]. While this is not unusual—fishes ranging from tidepool sculpins to juvenile flatfish exhibit similar behavior—they were also able to demonstrate that *S. inermis* relies heavily on olfaction or scent to return to their original point of capture[2]. In fact, vision-blocked fish (fitted with an opaque PVC mask) and control fish (wearing a transparent PVC mask) were equally successful in returning to their capture site. (The fish were tagged with acoustic tags and their movements through an array of receivers provided a means of tracking their behavior.) Following laboratory tests to verify there was no discernable effect on swimming or feeding behavior, scientists plugged the nares (nasal passages) of some fish with petroleum jelly. Compared to control fish with unobstructed nares, these fish showed poor homing success. The control fish returned quickly to their capture site, while four of the six fish with obstructed nares failed to return at all. Three of these stayed in the vicinity of the release location (described as high quality habitat), and one was lost by the scientists (moved out of the area, was eaten or the tag failed). The remaining two experimental fish did return to the capture site, but did so five days after their release, about the time that the petroleum jelly should have been flushed from their nasal passages.

(Left) Yellowtail rockfish, *S. flavidus*;

Credit: NOAA Fisheries

(Right) Copper rockfish, *S. caurinus*

Credit: Timothy J. Nesseth

These findings are relevant to fisheries science: *Sebastes inermis* is an important component of the Japanese fisheries, and some eastern Pacific rockfish have also demonstrated homing behavior (e.g. yellowtail, *S. flavidus*; olive, *S. serranoides*; quillback, *S. maliger*; and copper, *S. caurinus*). A critical premise of marine reserves is the assumption that certain species are resident in these areas; this research suggests a means by which some fishes maintain home ranges.

[1]Mitamura et al. 2002 Fisheries Science 68:1189-1196
[2]Mitamura et al. 2005 Journal of Experimental Marine Biology and Ecology 322:123-134

Accounting For The Value Added To Monterey Bay Fisheries

Carrie Pomeroy
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California fisheries contribute substantial and diverse economic benefits to fishing communities, the state and the nation. In measuring the economic value of commercial fisheries, there is a tendency to cite only the "ex-vessel" value – the price paid to fishermen for their catch. This is only part of fisheries' economic value, however: processing and distribution add substantially to that value.

Economist Michael Dalton and I recently completed a study of the "market channels and value added to fish landed at Monterey Bay ports." The project objectives were to estimate the value added to fish landed at Moss Landing, Monterey and Santa Cruz harbors, as the fish moved from fishermen to processors, packagers, distributors and seafood retailers, and to map the "spatial distribution" of fishing activity in the region. This information can be used to help policymakers assess the consequences of resource management, as required by state and federal law.

To estimate "value-added" for Monterey Bay fisheries, we collected and analyzed commercial fishing data, processors' expenditures and revenues, and local retail seafood prices. We also interviewed fish buyers about the history of their businesses, facilities, numbers of employees, top customers, and sources of goods and services. In addition, local harbormasters provided information on commercial fishing and processing activities at their respective harbors.

Our results provide some key insights into the distribution of fishing activity at and beyond each of the three ports, and the economic value and diversity of fishing operations in Monterey Bay. Between 1998 and 2003, Moss Landing was the center of fishing activity in the region, with an average annual ex-vessel value of almost $6 million. Comparable values for Monterey and Santa Cruz were $2 million and <$1 million, respectively. Moss Landing also had the most fish buyers, averaging 61 per year (Santa Cruz had 39 and Monterey, 21).

In 2003, the estimated ex-vessel value of all commercial fisheries in the region was about $10 million. The value added by processing and vendors was about $36 million and $24 million, respectively, for a total value added of $60 million. California market squid was the biggest contributor to these values, followed by salmon, albacore and sablefish, with several other fisheries playing a role as well.

Much of the catch landed at Monterey Bay ports is processed outside of Monterey and Santa Cruz counties. Of the fish processed in Monterey and Santa Cruz counties, much is sold to vendors in other counties, particularly to businesses around San Francisco Bay and further north.

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The Monterey Bay area hosts a diversity of fisheries, with sizeable value being added locally and farther afield. Fishing activity is greater at Moss Landing than at the other two harbors, but each harbor has its own niche. Together these make Monterey Bay a dynamic area for fisheries.

Note: The technical narrative for this report is available at: http://repositories.cdlib.org/csgc/rcr/MA05_01. The project was supported in part by the National Sea Grant College Program of the U.S. Department of Commerce's National Oceanic and Atmospheric Administration under NOAA Grant No. NA06RG0142, project R/MA-43, through the California Sea Grant College Program. We also thank the Pacific States Marine Fisheries Commission, and the local harbormasters, seafood buyers and vendors who generously participated in the study.

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