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DFG Photo by Sabrina Bell

Counting the number of anglers sometimes as difficult as counting the number of surfperch.

Story by Paul Reilly

The Deep End of Sandy Beach Habitat

On most every day along California's mainland shore, thousands of recreational beach anglers pursue a variety of fish that thrive over sandy, soft-bottom habitat. Participants find beach fishing relatively inexpensive, a pastime that provides nutritious meals as well as quality time outdoors in the sun and fresh sea air.

California has the most active surfperch fishery on the Pacific coast and monitoring it presents unique problems for marine biologists with the Department of Fish and Game. The violent nature of surfperch habitat—with its pounding surf and strong currents—makes it impossible to count fish within a given area the way wildlife biologists count deer on land. In deep sea conditions, marine biologists maneuver a tethered remotely operated vehicle with an underwater camera to calculate the number of fish. Among the gently swaying kelp

Previous pages: As part of the state finfish management project, biologists collect surfperch along southern California's Huntington Beach. Surveyors can determine the age of a fish by examining ear bones found in the head. Measurements for length, weight and sexual maturity help determine if the population structure is healthy. DFG uses the data to evaluate the effectiveness of fishery regulations. Below: These walleye surfperch show the typical species characteristics of relatively large eyes and black tips on the edge of the pelvic fins. The walleye is considered a medium-sized surfperch (between 7 and 8 inches long) found throughout California's nearshore sandy bottom habitat.

DFG Photo by Mark One

forests, teams of DFG scuba divers swim and count fish. But both these methods are rendered useless in pounding, swirling surfperch habitat.

"Recreational beach fishing for surfperch is rather unique to California due to the hundreds of miles of prime habitat for this hardy species group, the favorable weather for nearly eight months of the year and the thousands of anglers who live near easily accessible ocean fishing locations," says Tom Barnes, DFG senior marine biologist. "We have several marine scientists who are dedicated to better understanding the fishery and the biology of surfperches."

Anglers on the state's most popular recreational beaches target surfperch, California halibut, California corbina, croakers, jacksmelt and striped bass. One way DFG manages California's ocean fisheries is by setting fishing rules designed to sustain fish populations and recommend fishing seasons. It's a balancing act that requires a tremendous amount of data from anglers about the fish they target as well as an intensive study of ocean habitats.

"We're always interested in improving our ability to manage fisheries," says Barnes.

To that end, marine biologists in central and southern California tested the methods used to gather recreational fishery information. Ultimately they hoped to develop better ways to track surfperch fishing effort and catch. For nearly two years, from May 2007 through March 2009, Monterey County served as "ground zero" for the study. Researchers sampled three other counties, San Mateo, Santa Cruz and Orange, but less frequently. By the end of the study, 349 on-site surveys and more than 600 snapshot counts were completed.

Study Nuts and Bolts

The study employed a dual-survey approach. Researchers applied progressive angler surveys, or snapshot counts, of people fishing beach sites on a single day within a county. The second, more comprehensive approach, involved on-site surveys—taken at a single beach on a particular day—with examination of the catches and interviews of anglers who had finished their fishing trips. Anglers waited patiently as biologists weighed and measured each surfperch. Most of the people on the beaches fishing appeared to enjoy talking to the researchers while they waited. "Several times I had to politely turn down an offer for a beer from some of our more friendly anglers," says Kim

Under the Surface

Anglers line the shore during a sport fishing tournament held at Huntington Beach. Events like these allow DFG marine fisheries experts to collect information from people who are fishing in order to help determine the status of the fishery.

DFG Photo by Sabrina Bell

DFG Photo by Dave Ono

The barred surfperch is the most common surfperch along central California shoreline and the most often targeted by anglers. Average length of fish taken in central California is 9 to 10 inches. Any fish longer than 15 inches is considered exceptionally large.

For more information regarding this project, visit DFG's website at *www.dfg.ca.gov/marine/scuba/index.asp.*

Penttila, a biologist who completed on-site surveys in Orange County.

The study showed in Monterey and Santa Cruz, two of the less frequently surveyed counties, an estimated 40,500 beach fishing trips occurred during an 11-month stretch. That number represents the equivalent of approximately 120 people going fishing every day. Although anglers kept an estimated 20,600 barred surfperch, biologists rarely found any with a full 10-fish bag limit. Anglers told the researchers that, on average, they kept one barred surfperch on every other fishing trip. They said during their best months they averaged no more than two surfperch per trip.

Crunching the Numbers

Researchers developed catch estimates using two other numbers: the number of people who fished during a period of time and the average number of fish they caught, known as the catch rate. The study results showed that the greatest challenge to producing accurate counts is figuring out how many people fished.

A number of factors make it difficult to accurately estimate, in a cost-effective manner, the number of anglers fishing on California's beaches. Hundreds of miles of sandy beach attract anglers to the coastline. Beach fishing occurs at just about any time of day, from dawn to dusk. And, most importantly, the number of people fishing varies dramatically from hour to hour, day to day, and county to county.

When schools of fish, such as striped bass and surfperch, are close to shore, large numbers of anglers may head to the beach. A few days later after the fish have left, fewer anglers return to the beach. The study showed the number of people fishing on California's beaches varies greatly each day but the average catch rates are relatively consistent, indicating the snapshot counts should be conducted more frequently than the on-site surveys.

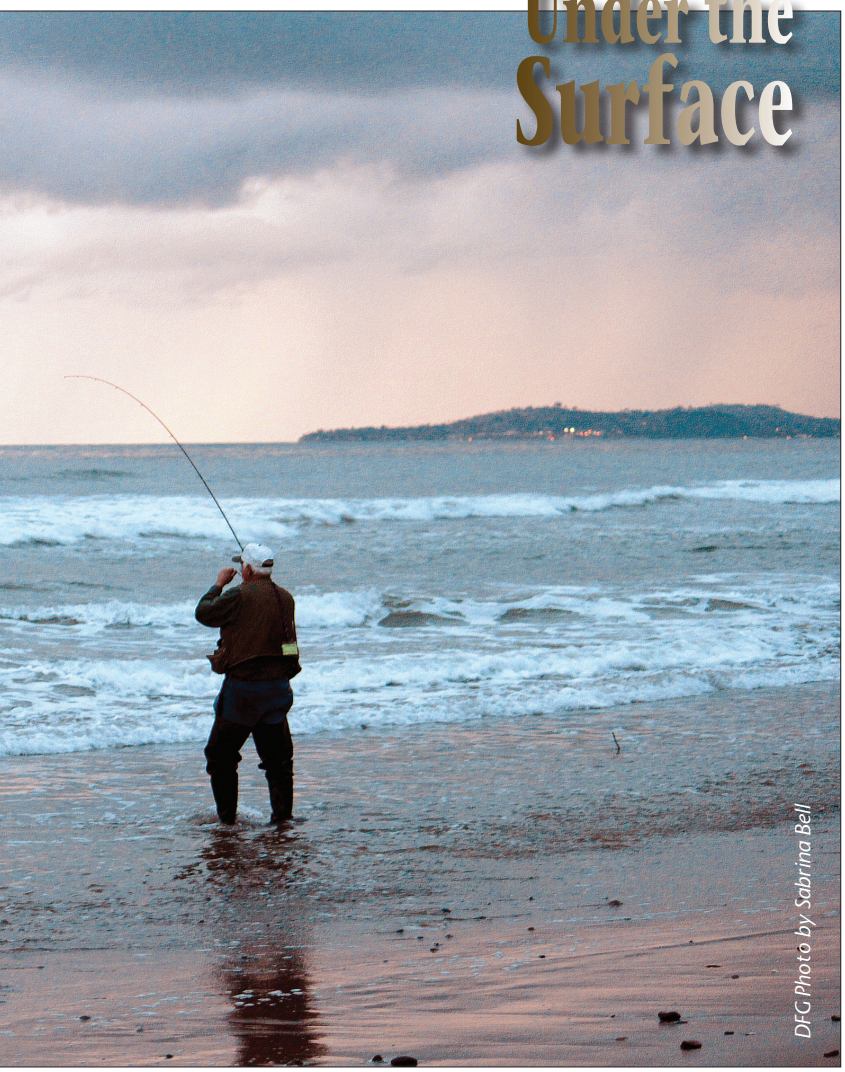
Fishing Central California Beaches

Over the life of the study, biologists gained insight into how anglers pursue particular fish. During the spring and summer of 2009, massive schools of striped bass appeared off central California beaches. Anglers responded by lining up to catch them, spread out from Monterey County north to San Francisco. During one Sunday in June, a biologist counted 132 anglers on a Monterey County beach with most of them trying for striped bass. Even anglers targeting surfperch landed legal-sized striped bass.

"Most surfperch anglers only carry a small creel bag to keep their surfperch out of the sun," says Ken Oda, a biologist who regularly sampled central California beaches. "When surprised by the occasional striped bass, which are much too large to fit into a surfperch creel, anglers needed to get creative to keep the fish from spoiling. On several occasions we saw anglers digging pits in the sand in order to keep the fish cool until they went home."

In Orange County, surveyors found surprisingly few anglers hit the beaches regularly. Yet, on some mornings, hundreds of anglers crowded along a single mile-long stretch of beach, participating in

Under the Surface



DFG Photo by Sabrina Bell

sport fishing tournaments.

According to the study's monthly catch averages, Orange County anglers kept few barred surfperch but had plenty of other fish to catch. Researchers noted nearly a dozen varieties of fish, including walleye and silver surfperch, California halibut, spotfin and yellowfin, that frequently bent anglers' poles. The fish were thrilling to catch but were released afterwards and were never targeted for a meal.

"The biologists on the project learned a great deal from the anglers they had contacted," says Adrienne Vincent, a DFG biologist. "We tried to return the favor by giving anglers brochures with fish identification information and by answering their questions. In the long run, of course, we try to repay them by managing these fisheries to the best of our ability."

Nearshore anglers tell surveyors they fish mainly for the enjoyment of the sport. Others have say they like the natural elements, the challenge of finding and catching the fish and the prospect of enjoying the meal they catch. The information about catch and effort that anglers provide during interviews carries significant value as DFG strives to maintain sustainable fisheries.

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