

# Northern and Central California Finfish Research and Management Project

## Our Mission

➤ To improve the knowledge and management of northern and central California finfishes of recreational and commercial importance, for which the State of California is solely responsible, with research, fishery-dependent and fishery-independent monitoring, and assessment. To provide oversight of compressed gas diving activities conducted by the Department.

## Staff

- Paul Reilly, Sr. Environmental Scientist Supervisor, Monterey (northern and central California)
- Kathryn Crane, Environmental Scientist, Eureka (northern California)
- Kristine Lesyna, Environmental Scientist, Belmont (central California)
- Ken Oda, Environmental Scientist, Monterey (central California)
- Dave Osorio, Environmental Scientist, Diving Safety Officer, Monterey (statewide)
- Travis Tanaka, Environmental Scientist, Monterey (central California)

## Connectivity With Other Projects

- California Recreational Fisheries Survey: this project provides critical and ongoing data for surfperch and halibut assessments through boat-and shore-based field sampling, including length, sex, weight, and CPUE by location statewide.
- Southern California Fisheries Research & Management Project : work together to provide a long time series of halibut lengths, sex, and ages for periodic stock assessments.
- Marine Protected Area Project: collaborate on MPA-based assessments for redbait surfperch.
- Aquaculture and Bay Management Project: work together on studies of larval and/or juvenile halibut in central California estuaries
- Invertebrate Management Project, MPA Project, Invasive Species Program, LED and other non-marine projects: dive safety program participation.

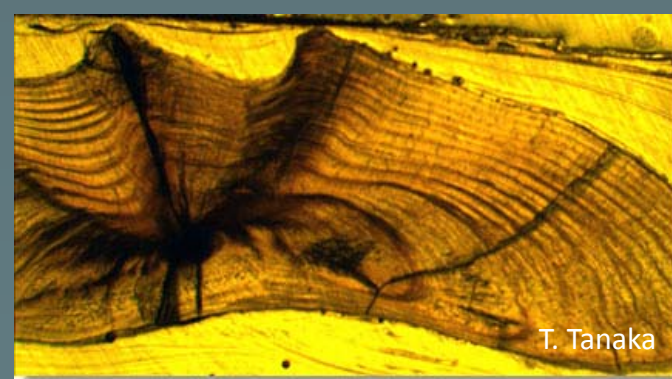
## California Halibut



Project staff began sampling California halibut statewide in 2007 to update and inform others about the status and trends within the fishery. With assistance from Southern California Fisheries & Management Project staff and Cheryl Barnes - MLML, project staff are continuing to monitor current trends in the halibut fishery to better inform management about resource needs and status.

### Ageing

Staff use a thin-sectioning technique to prepare halibut otoliths for ageing. Each otolith is read to agreement by two Project staff.



### Commercial Sampling



Staff monitor commercially-caught halibut landed by trawl and hook-and-line vessels from San Francisco to Monterey. Data such as length, weight, sex, and otoliths are collected. The Project dataset dates back seven years and includes halibut data from San Francisco to San Diego.



### Recreational Sampling

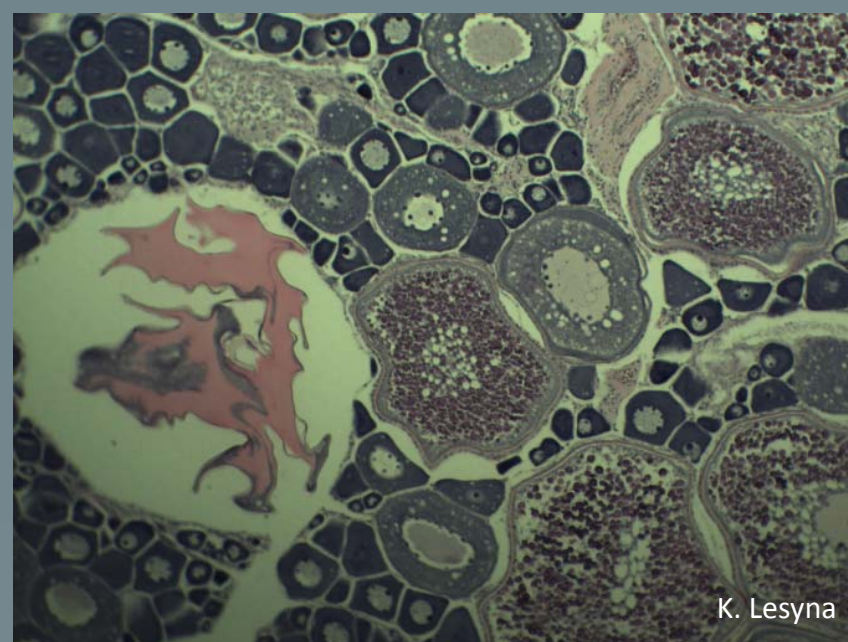
Project staff, sometimes with help from the NRPV, opportunistically samples recreational launch ramps and aboard CPFV's for halibut length, weight, sex, and otoliths. This sampling is done independently of the CRFS program to supplement the Project dataset.



### Stock Assessment Update

A stock assessment was completed and peer reviewed in 2011, the first for this species. The reviewers identified several data gaps, e.g., sex-specific size and age compositions, as well as limited growth and fecundity information. Project staff have since worked to resolve many of these issues and are in the preliminary stages of updating the 2011 stock assessment to include these new data.

### Maturity Study



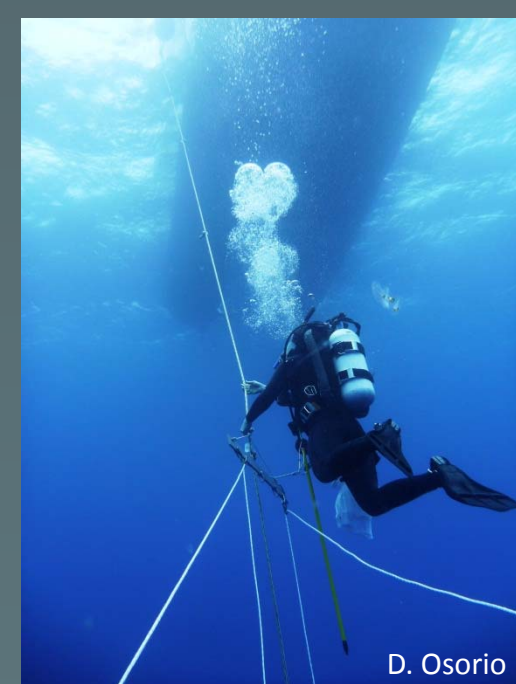
Staff are concluding a study to determine size and age at first maturity of San Francisco Bay halibut. Ovaries were sent to a contracted lab for processing to determine spawning stage. Publication of the study and findings is expected in the near future.

### California Halibut Fishery Management Plan

In anticipation of a formal request from Managers, Project staff have been preparing sections of a draft FMP for California halibut. Completed or nearly-completed chapters include Description of Stocks, Ecosystem Considerations, and History of Conservation and Management Measures. This draft FMP will be updated as new literature and other information, such as the stock assessment update, becomes available.



## Diving Safety Program



The Diving Safety Program (DSP) administers the compressed gas diving activities for all DFW Regions and Divisions. It oversees dive planning, supports field projects, and provides training for more than 70 active divers statewide (including Osorio and Lesyna)- in order to comply with state and federal OSHA diving regulations, ensure workplace safety, and promote efficient use of diving boating resources. Administered by MR, the DSP is a member of the American Academy of Underwater Sciences.

### Early Scuba Projects

In the late 1950s and early 1960s scuba proliferated as a tool for underwater research. The first DFG users were members of the southern California Sportfish Investigation Unit. Other early adopters included kelp forest research projects, the artificial reef project, and abalone project.



### Diving Safety Board

The Department's nine-member Diving Safety Board (DSB) helps guide a dive program with an excellent safety record. DSB members serve as technical and policy advisors, act as interagency liaisons, and consult on compliance issues. Several DSB members are active scuba instructors and play a key role in DSP training and safety programs.



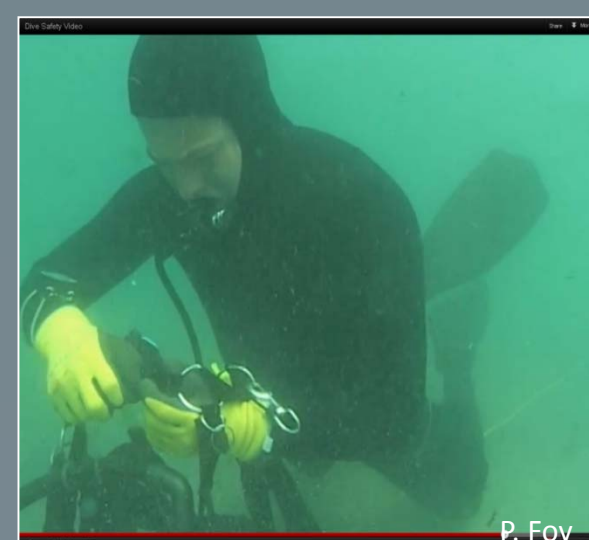
### Projects

Our divers- Scientific Aides, Environmental Scientists, Law Enforcement staff, Engineers, and select Volunteers-are engaged in diving projects in the ocean, rivers, lakes and reservoirs. Many projects are collaborative efforts involving divers from university and Federal agency dive programs.

Diving projects provide information for fishery management (e.g., species abundance, recruitment, size frequency). Diving staff also conduct regular monitoring, sampling, law enforcement investigations, evidence recovery, and other myriad tasks mandated by statute, management plans, and regulatory documents.

### Training and Education

Since the 1960s, more than 300 staff have been trained and have received authorization to dive for work purposes. In order to maintain active status, divers must log at least 20 dives annually and requalify swimming skills, emergency responder skills, and diving proficiency each year at recertification workshops. Each year, additional specialty training workshops are offered in addition to the 100 hour Scientific Diver Training course for new diving staff.



Annual recertification workshops are an integral part of DSP training and serve, in part, to maintain proficient emergency responder skills. They are also a venue for introducing new diving techniques, demonstrating diving proficiency, and evaluating dive gear for compliance. Workshops also provide an

opportunity for interdisciplinary safety training.



## Surfperch



Beginning in 2007, project staff began filling gaps in the Department's knowledge of sandy beach surfperch species in the sub-family Amphistichinae, primarily barred surfperch. In 2012, our project initiated data collection on north coast redbait surfperch. We have collaborated in developing citizen-based MPA sampling protocols with UC Davis researchers and recently

with Humboldt State University and the Trinidad Rancheria on tagging redbait surfperch in north coast MPAs.

### Progressive Angler Surveys

Progressive Angler Surveys (PAS): Project PAS involve estimating total beach angler daily effort, and use instantaneous counts of all beach anglers at all significant fishing sites within a county on random weekend/holiday and weekday mornings. PAS will provide continuity for a long-term data base on fishing effort which can be used to ground truth CRFS estimates of effort in a portion of one CRFS District (Monterey County).



### Fisheries Independent Surveys



Fisheries Independent Surveys (FIS) use primarily hook-and-line methods, beach seine, and research trawl to acquire species composition, CPUE, length, weight, sex, fecundity, ripeness, and age (otoliths) of adults. Juveniles and embryos are also sampled. Future work will include a captive age validation study using oxytetracycline-marked fish, and comparing readings from surface and sectioned otoliths.

### Commercial Sampling

The State's top ports for commercial surfperch landings are located in the Morro Bay, San Francisco, and Eureka port complexes. Banded and redbait surfperch are shore based hook-and-line while the sub-family Embiotocinae – primarily, striped, black, rubberlip, and pile are landed by a skiff fleet operating in San Francisco Bay. Shiner perch supports a live bait fishery in San Francisco Bay.



## Night Smelt

### Research



In 2014, project staff began working collaboratively with commercial fishermen, and H.T. Harvey consulting biologists, to learn more about the night smelt population in northern California. In addition, staff have initiated A-frame night smelt surveys along the San Mateo County Beaches in January 2015. Project staff are using information collected during this study to answer some very basic,

but essential, questions about night smelt life history in order to support science-based management in the future



## Hagfish



Central and northern California fishery Project staff monitors the catch and average size of hagfish landed at the ports of Eureka and Morro Bay. Randomly selected fish are retained for EFI purposes.

### Hole Diameter Study

In 2013, staff conducted a trap survey on trap hole diameter and average retained hagfish size. Based on the data from this survey, a new regulation, effective January 1, 2015 established a minimum hole diameter of 0.56 in. for all traps used to take hagfish. A white paper describing this study and the results were published in Cal Fish and Game 100(2).



### Experimental Gear Permit-40 gal Barrel Traps



Two fishermen approached the Fish and Game Commission requesting an EGP to fish 40-gal barrel traps. Project staff conducted several observation trips, collected samples and analyzed log data to determine the benefit or impacts of this gear. It was determined that the gear yielded less dead loss, improved quality of landed fish, and greatly reduced

negative gear interactions. The regulation allowing this new gear will go to notice at the August 2015 Commission meeting.

## Pismo Clam

### Density Survey

Project staff began a series of semi-annual Pismo clam surveys in 2008 to re-establish a long-term relative abundance data base in the Monterey Bay area. Standard beach transect sampling methods established by the Department were used to determine density and size frequency of Sunset State Beach, Santa Cruz County. During the past 6 1/2 years we observed a declining trend in the average density of Pismo clams, and we rarely observed evidence of recent recruitment. Our most recent survey yielded no clams for the first time.



## Grunion

### Spawn Monitoring



Project staff conduct bi-monthly surveys for grunion spawning on Del Monte Beach adjacent to Monterey's Wharf 2 from April – July. Possible beach grooming with heavy machinery in proximity to a spawning event was reported by the public. Grunion samples were collected and grooming activities were observed.