

## **BOG Meeting Summary: Developing a Sampling Design for a Statewide Survey of Bioaccumulation on the California Coast**

March 19, 2008

### **Items 1 and 2.**

Jay Davis gave a Powerpoint presentation that outlined the goals of the meeting and provided an overview of the topic. The Powerpoint is posted on the BOG website: <http://www.sfei.org/cmrbog/index.html> on the page for this meeting.

### **Item 3**

This was covered under Item 4.

### **Item 4: Design for the Fishing Beneficial Use**

#### **Significant Prior Work**

Key points about the major previous coastal sport fish monitoring programs are listed below.

#### Coastal Fish Contamination Program

- A screening study
- More detailed sampling in a couple of places to support advisories: Tomales and San Diego.
- Sampling locations were non-random – selected by the coastal Water Boards
- Looked at MRFSS data for popularity of fishing locations.
- 50 – 60 locations per year
- Looked at 2 indicator species: one a mercury indicator and one an organics indicator.
- No shellfish
- Some dioxin analyses
- The budget was approximately \$325/yr. This was considered to not really be enough for each of the regions. The budget did not include any reporting
- Gassel et al. 2002 for some more information. If you want a copy send an email to [jay@sfei.org](mailto:jay@sfei.org).

#### Southern California Bight Monitoring

- First done in 1994, then 1998, 2003, and next in 2008/9
- Has focused on aquatic life impacts
- In 1994 measured pollutants in flatfish livers
- 1998, focused on sanddab guild, 225 locations, composite samples
- Site selection has been probability-based (stratified random)

- Lots of DDT and PCBs accumulate, not much else
- Availability of meaningful thresholds has been a problem. Have applied Canadian guidelines in the past, but these are problematic.
- In 2003 started sampling midwater fish, whole body analysis. Sampled DFG blocks.
- In 2009, will focus on sport fish and coordinate with the SWAMP coastal survey.
- Bight monitoring is based on voluntary efforts
- The Bight group can contribute analysis of about 200 samples to the coastal survey. They don't have resources for fish collection.

#### NPDES Monitoring in Southern California

- Six dischargers conduct this monitoring annually
- The designs are variable
- Species analyzed frequently are rockfish, croaker, kelp bass
- Fish are collected mostly by hook and line
- Analyzed mostly as fillets
- Analytes include DDT, PCBs, Hg
- The dischargers expand their analyte lists in concert with Bight monitoring
- All sites are coastal or offshore

#### MSRP (Montrose Settlements Restoration Program)

- Monitoring was done to update the fish advisory
- Used MRFSS info to select sites
- Collected 2,676 fish, including individuals from 30 locations between Ventura and Dana Point, representing 23 different species.
- DDTs, PCBs (on a congener basis), mercury, chlordane, and dieldrin
- Mostly analysis of individuals, 10 fish per sites
- Bight 08 intends to avoid duplication of this effort
- DDT and PCBs were still prevalent in these fish
- A report on this work is available at:  
<http://www.darrp.noaa.gov/southwest/montrose/pdf/msrpEpaFishStudyReport.pdf>

#### City and County of San Francisco

- Outfall monitoring since early 1980s
- Used to include mussels
- Offshore discharge began in 1986
- Annual monitoring
- Several stations near outfall and at reference locations
- Muscle and liver/hepatopancreas in English sole and Dungeness crab
- Did sanddabs in 2006
- Whole sole in 2007
- Pesticides, PAHs, PCBs, metals
- Speciated As recently
- Concentrations generally low
- Benthos and sediment chemistry also collected at 50 stations

- Data available at:  
[http://sfwater.org/detail.cfm/MC\\_ID/20/MSD\\_ID/198/MTO\\_ID/515/C\\_ID/3102](http://sfwater.org/detail.cfm/MC_ID/20/MSD_ID/198/MTO_ID/515/C_ID/3102)
- May be able to modify their monitoring to do something more useful
- Permit is up for renewal this year
- RMP is doing a special study to integrate SF coastal data with Bay data

## Management Questions

See the attached Powerpoint for the question formulated by the group.

Key points made in discussion

- 303(d) listing is not a high priority for the coast like it was for the lakes survey
  - Segment delineations are fuzzy
- However, 303(d) listing is a priority for bays and estuaries
- We want to be able to provide information to anglers on locations and regions that are contaminated and uncontaminated
- We want to be able to provide information on the degree of contamination of the 5 or 6 most popular fish species on a statewide basis
- The study could take a phased approach (similar to the lakes survey), beginning with a statewide screening and followed by more detailed followup sampling where it is needed. The money for followup sampling should come from other programs.
- Results of the survey should be presented in terms of identifying locations where fish can be safely consumed
- OEHHA uses 1 meal per week as a threshold for a safe eating guideline (consistent with the American Heart Association recommendation for heart health)

## Design Considerations

Fishing Beneficial Use

See the attached Powerpoint for the outcome of the group discussion.

Additional points made in discussion

- We can develop geographic zones for stratification
- A sample size of 30 per stratum is the minimum needed for a characterization
- Providing information for managers and the public based on sampling locations is a high priority and should drive the design.
- Providing information for managers and the public based on fish species is also a priority. We should strive for a design that also provides a solid statewide assessment of contamination of popular fish species.
- OEHHA decides on whether to issue regional or site-specific consumption advice on a case-by-case basis.

- We should look back at the CFCP data for information on catch and other topics to inform the design of the present study
- Characterizing the party boat fishery is a lower priority than characterizing pier and shore fishing. We should cost out the survey of pier and shore and see if money is left over to cover party boat.
- The BOG survey will cover coastal locations. Regional programs (SC Bight, RMP, others?) will cover harbors, bays, and estuaries. BOG will cover harbors, bays, and estuaries that are not covered by regions (e.g., perhaps Humboldt).
- We should check the NOAA-EMAP survey to see if they generated any relevant sport fish data
- Pier Fishing in California by Ken Jones is a good resource

### Aquatic Life Beneficial Use

#### Points made in discussion

- SQOs are being promulgated for direct effects. Indirect effects (bioaccumulation and risks to human health) will also be incorporated into SQOs. The State Board will value information to support assessment of indirect effects. A workshop is taking place in July that will include experts on bioaccumulation. Coordinated sampling of fish and sediment coupled with lab bioaccumulation tests are the data used to assess indirect effects. The group agreed to wait for the outcome of the July meeting to decide how to address this topic.
- SCCWRP is collaborating with the National Mussel Watch program to perform expanded sampling in Southern California. The data are primarily valuable for assessing temporal trends and spatial patterns. These data are of limited value for assessing impacts to aquatic life. The National Mussel Watch found very high concentrations of PBDEs at a location in Southern California and is following up on this.
- Lack of thresholds is a major problem with assessing bioaccumulation impacts on the aquatic life beneficial use. This has been illustrated by the Bight sampling.
- The use of prey fish as an indicator of wildlife exposure is a tool that is being employed by the RMP and that is valuable in the mercury TMDL for San Francisco Bay. This may be more applicable in bays and estuaries than on the coast, especially where applicable thresholds exist.
- Collin Eagles-Smith gave a presentation summarizing the impacts of mercury on aquatic birds in San Francisco Bay, and the monitoring tools that are in development by USGS. The Powerpoint is available on the BOG website at: <http://www.sfei.org/cmr/bog/index.html> on the page for this meeting.
- The group agreed that in the absence of applicable thresholds for aquatic life, the BOG survey should focus on the fishing beneficial use.