

# Salton Sea Fisheries Long-term Monitoring

## Draft Quarterly Report: Winter 2004

Salton Sea Program  
Department of Fish and Game  
78078 Country Club Dr., Ste. 109  
Bermuda Dunes, CA 92201

### **Introduction:**

The California Department of Fish and Game (CDFG) is monitoring the status and trends of the Salton Sea fisheries. This will require a compilation of sampling results over several years. In the spring of 2003, Department personnel started quarterly sampling at fourteen stations around the sea, as the basis of a long term monitoring program. To allow comparison of current and future monitoring efforts by CDFG to past results, the following protocol was adapted from those previously used by researchers at the Salton Sea.

Each quarter, if conditions allow, this protocol will produce about 816 net-hours of sampling. After each quarter's sampling is completed this draft report will be prepared, summarizing the numbers and species of fish netted, and calculating the overall and species-based catch-per-unit-effort (CPUE). This report will also offer qualitative comments on the condition and breeding status of each species. After annual repetitions of seasonal sampling, enough data will be collected to allow statistical tests for significant differences in numbers, seasonality, and site use, by and among the four species of fish.

### **Methods:**

The sampling sites comprise three broad habitat types: pelagic (3 sites), near-shore (8 sites), and estuarine (3 sites). The pelagic sites are in the approximate middles of the north basin, south basin and inter-basin areas of the Sea. The near-shore sites are spaced widely apart, four each, near the west and east shores, to capture as much breadth of habitat as possible. The estuarine sites are in the body of the Sea, close enough to the mouths of the New, Alamo, and Whitewater Rivers, to be under the influence of their outflows. See Table 1. for the exact locations of all sites.

Sampling takes place during each of the putative seasons, as follows: spring- April and May; summer- July and August; fall- October and November; winter- January and February. We will attempt to compress the total sampling period into as few days as possible, to the extent that the weather, equipment maintenance, and personnel scheduling constraints allow. Nets are typically set at one or two sites in the morning, and hauled in after approximately 24 hours. The exact number of hours set is recorded for each net, to the nearest quarter-hour.

Fish are sampled by deploying multi-panel monofilament gill nets with 6 X 30 foot panels of 0.5, 1, 2, 3, and 4 inch mesh. Two nets are set at all sites at the water's surface. The nets are set far enough apart to allow room for maneuvering a boat during setting and retrieval, usually 100-200 meters. The nets at near-shore and estuarine sites are set in 2.5 to 4.5 meters of water, typically 200-300 meters from the shore.

Two additional nets are set at the bottom of water column at the three pelagic sites. The conditions fish experience at the bottom in deep water is different enough from the surface water,

in dissolved oxygen, light, food availability and temperature, that this can be considered a discrete habitat, and thus we sample it as though it were a separate site.

At the time of each set and retrieval, water depth, water temperature, conductivity, salinity, and dissolved oxygen are measured and recorded.

When nets are pulled in the following day, all fish are removed and immediately stored on ice. Data are collected from these fish as soon as possible, almost always the same day they are hauled in.

All fish are identified to species level and counted. For the four sport fish in the Salton Sea, (tilapia, Gulf croaker, orangemouth corvina and sargo) weights, lengths (fork length), sex, physical condition, and reproductive status are recorded. Fish above five pounds are weighed to the nearest ounce. Fish below five pounds are weighed to the nearest half ounce. Lengths of fish under 50 centimeters are recorded to the nearest millimeter. Lengths of fish over 50 centimeters are recorded to the nearest centimeter. The sex of all adult fish is determined by dissection. A sample of at least ten fish of each species is also dissected to determine physical condition and breeding status.

### **Results:**

The Winter 2004 sampling session took place from January 26 to March 9. Table 2. shows the totals of fishes sampled at each site. A single deep water site went unsampled this quarter, due to mechanical problems with our primary sampling vessel. Total numbers of fishes sampled, with CPUE in parentheses, were: 6 tilapia (<.01), 0 Gulf croaker (.00), 0 orangemouth corvina (.00), 0 sargo (.00). The overall CPUE (<.01) was the same as for tilapia, since they comprised the entire sample for the period.

The six tilapia were all apparently from last year's oldest cohort, and ranged from 143 mm to 154 mm. The tilapia were in good condition. All were sexually mature, but four of five females had only immature ova, 1.5 mm or smaller. No fish displayed breeding coloration.

### **Discussion:**

Chart 1. shows a comparison of CPUEs from this and the previous sampling sessions. The columns labeled 2002 are from an initial sampling period undertaken from June 10, 2002 through March 13, 2003. These data should be roughly comparable to later efforts, although they are not an exact replication of the sites included in our current protocol.

Our Winter CPUE shows a further dramatic reduction of last year's cohort of tilapia. Tilapia numbers were too small (6 fish) to allow any analysis of their distribution.

No Gulf croaker, orangemouth corvina, or sargo were sampled this period. As during the last two sampling periods, the lack of angler success with these species, and the absence of fish kills containing them, reflect our results.

In previous reports, we explored whether some fish-limiting threshold of dissolved oxygen might be determined. The overall absence of fish this sampling period would have skewed the analysis, and artificially raised any oxygen threshold. Therefore, we did not add these data to the analysis.

The obviously depressed fish populations have raised concern over whether some water quality parameters, especially salinity, may have breached the threshold values which preclude further reproduction or survival of some aquatic biota of the Salton Sea. At the end of this

sampling session, we found large numbers of healthy adult pile worms in some of our deep water nets. Although there may indeed be population declines being driven by deteriorating water conditions, to date the capacity for seasonal rebounds by this cornerstone organism remains.

This sampling period completes our first full year of protocol sampling at the Salton Sea. We will write and distribute an analysis of the entire year's results as soon as possible. In addition to gill-netting we will incorporate a year's worth of fish trapping data, compiled during the same period.

**Table 1. Locations of Sampling Sites**

<b>SITE NAME</b>	<b>HABITAT TYPE</b>	<b>UTM COORDINATES</b>
Whitewater River	Estuarine	11S 0587948
		3707343
New River	Estuarine	11S 0621567
		3666958
Alamo River	Estuarine	11S 0628480
		3675635
North Shore	Near-shore	11S 0598465
		3709237
North Wister	Near-shore	11S 0628368
		3685497
Bat Caves	Near-shore	11S 0607427
		3699864
South Salton City	Near-shore	11S 0604971
		3682198
North Desert Shores	Near-shore	11S 0589366
		3699424
The Dome	Near-shore	11S 0596997
		3690022
The Cliffs	Near-shore	11S 0615062
		3691509
Test Base	Near-shore	11S 008813
		3672196
North Basin	Pelagic	11S 0596156
		3701218
Inter-basin	Pelagic	11S 0606837
		3689452
South Basin	Pelagic	11S 0618275
		3678697

**Table 2. Results from Winter 2004 sampling period**

<b>Date</b>	<b>Site</b>	<b>Net-hours</b>	<b>Tilapia</b>	<b>Croaker</b>	<b>Corvina</b>	<b>Sargo</b>	<b>Other</b>	<b>Total Fish</b>	<b>CPUE</b>
1/26/2004	Alamo River	50	0	0	0	0	0	0	0.00
1/26/2004	North Wister	49	0	0	0	0	0	0	0.00
1/28/2004	The Cliffs	48	0	0	0	0	0	0	0.00
1/28/2004	North Shore	47	3	0	0	0	0	3	0.06
1/29/2004	Bat Caves	47	2	0	0	0	0	2	0.04
2/5/2004	The Dome	45	0	0	0	0	0	0	0.00
2/5/2004	South Salton City	45	1	0	0	0	0	1	0.02
2/19/2004	White Water River	46	0	0	0	0	0	0	0.00
2/19/2004	North Desert Shores	45	0	0	0	0	0	0	0.00
3/4/2004	New River	47	0	0	0	0	0	0	0.00
3/4/2004	Test Base	48	0	0	0	0	0	0	0.00
3/5/2004	South Basin, Bottom	45	0	0	0	0	0	0	0.00
3/5/2004	South Basin, Surface	45	0	0	0	0	0	0	0.00
3/8/2004	Interbasin, Bottom	47	0	0	0	0	0	0	0.00
3/8/2004	Interbasin, Surface	47	0	0	0	0	0	0	0.00
not sampled	North Basin, Bottom								
not sampled	North Basin, Surface								
<b>Totals</b>		<b>698</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6</b>	<b>0.009</b>

Chart 1.

## Comparison of CPUEs

