San Diego Bay Fish Consumption Study

Chad Loflen
SWAMP BOG
November 09, 2017
Background
A Healthy Guide to Eating Fish from San Diego Bay

Women over 45 years and men can safely eat more fish.

- Diamond turbot
- Spotted turbot
- Black perch
- Pile perch
- Rainbow seaperch
- California lizardfish
- Round stingray
- Shovelnose guitarfish
- Spotted sand bass
- Barred sand bass
- Pacific chub mackerel
- Leopard shark
- Gray smoothhound shark

2 servings a week: Eat only the skinless fillet. PCBs are in the fat and skin of the fish.

1 serving a week: Why eat fish? Eating fish is good for your health. Fish have Omega-3s that can reduce your risk for heart disease and improve how the brain develops in unborn babies and children.

Do not eat: What is a serving? The recommended serving is the size and thickness of your hand. Give children smaller servings.

- For Adults: Remove and throw away the skin before cooking.
- For Children: Cook thoroughly and allow the juices to drain away.

Women 18-45 years and children 1-17 years

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California Office of Environmental Health Hazard Assessment • www.oehha.ca.gov/fish • (619) 622-2700 • (858) 622-3130
Background

• Last angler survey conducted in 1990
• NGO conducted a survey in 2005
• Consumption rates for cleanups?
• Disadvantaged communities?
• Methods of preparation?
• Target species?
Background

• Funding: Discretionary Contract with SCCWRP
• City of San Diego
• Port of San Diego

• Project Lead: Dr. Steven Steinberg (SCCWRP)
• Technical Advisory Group: CADFW, SD Water Board, Navy, City of San Diego, Port of San Diego, USPEA, State and County Public Health, Industry, NGO, Recreational Angler, UC Davis, State Water Board
Targeted Pier, Shore, and Boat Anglers

Figure 3. Aerial image of San Diego Bay. Survey zones in the north, middle and south bay regions are indicated by the colored boxes.
26 Question Survey

- Consumption Rates
- Preparation Methods
- Species Consumed
- Zip Code
- Sharing of Catch
- Self-reported Ethnicity
### Results

Surveys conducted from May 01, 2015 through April 30, 2016

Multi-variate sampling schedule used

Of those approached, **81 percent were first-time interviews**

<table>
<thead>
<tr>
<th>Type of Angler</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pier Angler</td>
<td>952</td>
<td>61</td>
</tr>
<tr>
<td>Boat Angler</td>
<td>367</td>
<td>24</td>
</tr>
<tr>
<td>Shoreline Angler</td>
<td>230</td>
<td>15</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1549</td>
<td>100</td>
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</table>

<table>
<thead>
<tr>
<th>Type of Angler</th>
<th>Count</th>
<th>%</th>
<th>% Completed</th>
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<tbody>
<tr>
<td>Pier Angler</td>
<td>706</td>
<td>65</td>
<td>74</td>
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<tr>
<td>Boat Angler</td>
<td>175</td>
<td>16</td>
<td>48</td>
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<tr>
<td>Shoreline Angler</td>
<td>205</td>
<td>19</td>
<td>89</td>
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<tr>
<td><strong>Total</strong></td>
<td>1086</td>
<td>100</td>
<td>70</td>
</tr>
<tr>
<td>County</td>
<td>Count</td>
<td>Percent</td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------</td>
<td>---------</td>
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<tr>
<td>San-Diego County</td>
<td>1093</td>
<td>70.6</td>
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</tr>
<tr>
<td>Riverside County</td>
<td>21</td>
<td>1.4</td>
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<tr>
<td>Los Angeles County</td>
<td>11</td>
<td>0.7</td>
<td></td>
</tr>
<tr>
<td>Orange County</td>
<td>8</td>
<td>0.5</td>
<td></td>
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<tr>
<td>San Bernardino County</td>
<td>7</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Monterey County</td>
<td>5</td>
<td>0.3</td>
<td></td>
</tr>
<tr>
<td>Kern County</td>
<td>1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Alameda County</td>
<td>1</td>
<td>0.1</td>
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<tr>
<td>Placer County</td>
<td>1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Yolo County</td>
<td>1</td>
<td>0.1</td>
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</tr>
<tr>
<td>Sacramento County</td>
<td>1</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>San Mateo County</td>
<td>1</td>
<td>0.1</td>
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<tr>
<td>Total Within State</td>
<td>1151</td>
<td>74.3</td>
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</table>

<table>
<thead>
<tr>
<th>State</th>
<th>Count</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Arizona</td>
<td>10</td>
<td>0.6</td>
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<tr>
<td>Colorado</td>
<td>2</td>
<td>0.1</td>
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<tr>
<td>Nevada</td>
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<td>0.1</td>
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<tr>
<td>New Mexico</td>
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<td>0.1</td>
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<tr>
<td>Texas</td>
<td>1</td>
<td>0.1</td>
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<tr>
<td>Utah</td>
<td>1</td>
<td>0.1</td>
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<tr>
<td>Oregon</td>
<td>1</td>
<td>0.1</td>
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<tr>
<td>Total Out of State</td>
<td>18</td>
<td>1.2</td>
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<tr>
<td>Unknown</td>
<td>380</td>
<td>24.5</td>
</tr>
<tr>
<td>Overall Total</td>
<td>1549</td>
<td>100.0</td>
</tr>
</tbody>
</table>
Results

• 49% Eat Bay Fish
• 67% Consume Fillets
• 33% Consume Whole

Consumption Rates:
• 0.0 to 200+ grams/day

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Local Anglers (San Diego Bay)</th>
<th>Asians</th>
<th>Older Than 60 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (Standard Deviation)</td>
<td>6.3 (18.14)</td>
<td>19.9 (39.40)</td>
<td>12.0 (25.67)</td>
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<tr>
<td>Minimum Value</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Maximum Value</td>
<td>212.6</td>
<td>212.6</td>
<td>212.6</td>
</tr>
<tr>
<td>Geometric Mean</td>
<td>1.5</td>
<td>5.5</td>
<td>3.2</td>
</tr>
<tr>
<td>Median (50th Percentile)</td>
<td>0.0</td>
<td>8.5</td>
<td>4.3</td>
</tr>
<tr>
<td>75th Percentile</td>
<td>5.7</td>
<td>20.6</td>
<td>10.6</td>
</tr>
<tr>
<td>90th Percentile</td>
<td>14.2</td>
<td>56.7</td>
<td>29.1</td>
</tr>
<tr>
<td>95th Percentile</td>
<td>28.3</td>
<td>76.8</td>
<td>42.5</td>
</tr>
<tr>
<td>99th Percentile</td>
<td>73.7</td>
<td>212.6</td>
<td>124.6</td>
</tr>
<tr>
<td>N</td>
<td>468</td>
<td>67</td>
<td>70</td>
</tr>
</tbody>
</table>

8 ounce weekly serving = 32.4 grams/day
Results
Results

Percent of Anglers Keeping Fish in Week Before the Interview

Fish Name

A Healthy Guide to Eating Fish from San Diego Bay

Women over 45 years and men can safely eat more fish

- Diamond turbot
- Spotted turbot
- Black perch
- Pile surf perch
- Rainbow seaperch
- California halibut
- Round stingray
- Shoenvose guitarfish
- California lizardfish

Barred sand bass
- Yellowfin croaker
- Leopard shark
- Gray smoothhound shark

Do not eat

3 servings a week
- Diamond turbot
- Spotted turbot
- Black perch
- Pile surf perch
- Rainbow seaperch
- California halibut
- Round stingray
- Shoenvose guitarfish
- California lizardfish

Eat only the skinless filet, PCBs are in the fat and skin of the fish.

What is a serving?

- For Adults: The recommended serving is the size and thickness of the fish:
- For Children: The recommended serving is the size and thickness of your hand. Give children smaller servings.

What is the concern?

- Some fish have high levels of mercury or PCBs. Mercury can harm the brain, especially in unborn babies and children. PCBs can cause cancer.

Why eat fish?

Eating fish is good for your health. Fish have Omega-3s that can reduce your risk for heart disease and improve the brain develops in unborn babies and children.

1 serving a week
- Pacific chub mackerel
- Barred sand bass
- Yellowfin croaker
- Leopard shark
- Gray smoothhound shark

Do not eat

1 serving a week
- California halibut
- Round stingray
- Shoenvose guitarfish
- California lizardfish

Do not eat

- Pacific chub mackerel
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For Adults

- What is the concern?
- Why eat fish?

For Children

- What is the concern?
- Why eat fish?
Summary

• Varied Rates of Consumption
• Whole Fish Consumed, Most Fish Fried
• Certain Species Targeted
• Many Anglers at High Risk