1.) Data Collection methods:

Environmental conditions data, including tide, turbidity, surface and bottom electrical conductivity, water temperature, and secchi depth, are collected at each station at the time of sampling. A 10-minute surface tow is performed by two boats, the net boat and the chase boat. Upon completion of the tow, the net is retrieved and the cod ends emptied into a bin for sorting and identification. A General Oceanics flowmeter is deployed over the side of the boat to estimate the water volume filtered through the net. All fish are identified to the species level and FL (forked caudal tail) or TL (non-forked caudal tail) measured to the nearest millimeter. If identification can not be made on board the fish is retained and identified in the lab. Catches exceeding 50 are subsampled unless it is a species of concern (i.e. Salmonids and Osmerids). All Delta Smelt sex and maturity stages are determined on the boat. All adults are retained for researchers at UC Davis and CDFW. These individuals are identified in the database as having a unique numeric identifier assigned to each fish in the field.

2.) Link to blank datasheet:

Available upon request (see data contact information)

3.) Instrument and Equipment Specifications, including QAQC methods and frequency:

The SKT survey employs a standard Kodiak trawl with a total length of 65’ (19.8-m), and a fully expanded mouth opening of 25’ by 6’ (7.62-m by 1.83-m). A weighted foot-rope and a head-rope with floats allow the trawl to fish the top 1.8-m of the water column. The trawl is constructed of green or black variable mesh ranging in dimension from 2” knotted stretched mesh at the mouth and decreasing by ½” through a series of 5 panels to ¼” knotless stretched mesh at the cod-end. The cod-end is zippered and is tied off with a slipknot 5 feet from the zipper (6 feet in total length). A 10-lb. cannon-ball weight is attached to each wing-tip, and a 15-lb cannon-ball weight is attached on each side of the net approximately 10-ft forward of the mouth.

The YSI Model 30 is used to measure water temperature and electrical conductivity. The probe is rinsed between samples by storing it in a bottle of distilled water that is discarded at the end of the day. YSI units are calibrated using commercially available conductivity standards annually before the beginning of each survey season. Hach 2100P turbidity meters are used to measure turbidity in nephelometric turbidity units (NTUs). Turbidity meters are calibrated annually with commercially available standards designed specifically for the model before each field season. Secchi discs are black and white discs that measure water clarity by measuring the depth of disappearance from the water’s surface, or the distance light can penetrate. Secchi discs are mounted onto rigid meter sticks, with a maximum depth of 200cm. Measurements are taken in the shade, with no sunglasses on, and are done by the same person the entire day for consistency.

4.) Analysis Methods and SOPs:

Water volume sampled in each tow is calculated using data collected by a flowmeter. The difference in flowmeter counts is calculated by subtracting the flowmeter reading when the net is put into the water from the flowmeter reading when the net is taken out of the water. This value is then multiplied by a factory calibration factor to convert the reading into a number of meters of flow. This is multiplied by the area of the net to estimate the volume of water sampled in each tow.

5.) Project History:

2002 - project Start

2003 -

2004 -

2005 - cod end mesh changed for ¼” to 1/8”

2006 -

2007 - cod end returned to ¼” mesh

6.) QA/QC

Methods: After each tow, the field lead verifies that the flowmeter count is within the appropriate range, and if not, a re-tow is required. If there is an obvious reason that the flow meter was out of range, (e.g. weeds caught in the net or on the flowmeter), it is recorded as the reason for a re-tow in the “comments” section of the datasheet.

Data: All computer data entry into the local database undergoes two rounds of ‘line by line’ checks, wherein all fields are checked against the original datasheets for fidelity. At the end of the survey field season and data entry is complete, the environmental and fish data is ‘finalized’ such that it is clean for analysis and available for public consumption. The first step in this process is to conduct final line-by-lines. Each survey gets two complete line-by-lines (in addition to the two line-by-lines conducted upon entry). Once the end of season line-by-line is complete a project lead will run a series of database queries called ‘Edit’ queries. These queries catch outliers and other erroneous environmental and catch data. Not all data is changed because it is an outlier (outside of 2 standard deviations is the criteria for most queries). In most cases, outliers are real data. These queries are to alert the project lead of potential erroneous data, and care is taken to edit only data that truly needs to be edited.

7.) Contractor Information: N/A

8.) External Review Process: N/A

9.) Methods References: N/A