FIELD SAMPLING
TO DETERMINE FISH ABUNDANCE AND DISTRIBUTION
December 1994

As part of the Interagency Ecological Program, the Department of Fish and Game uses several types of net sampling gear to estimate fish abundance and determine their distribution in the Bay-Delta. The townet and mid-water trawl nets are gear types which have been used over the past 35 years to provide information on the abundance and distribution of striped bass and other fish. This same gear collects delta smelt and the resulting delta smelt indices have been used to evaluate trends of this threatened native fish. Recently, another gear type, the Kodiak trawl, was evaluated to determine if it is more effective at capturing delta smelt. Last spring, the Kodiak trawl was tested against the townet for capturing juvenile delta smelt. Later in the summer, the Kodiak was tested against the mid-water trawl net, and a modified Chipps Island trawl net for capturing adult delta smelt. Following is some information about this comparison study.

Dimensions of Nets and Area of Water Sampled

- The mouth of the Kodiak trawl is 25 feet by 6 feet, sampling an area of 150 ft^2.
- The mouth of the townet is "D" shaped and samples an area of 16 ft^2.
- The mouth of the mid-water trawl is 12 feet by 12 feet, sampling an area of 144 ft^2.
- The mouth of the Chipps trawl is about 36 feet by 12 feet, sampling an area of 432 ft^2.

Vessels Used for Trawling

- The Kodiak trawl requires the use of two small (18 - 20 feet) boats. The townet, mid-water trawl and Chipps trawl requires the use of one boat. While the townet can be towed with a smaller boat (18 - 20 feet), the mid-water trawl and Chipps trawl require a larger boat (28 - 32 feet).
- No special gear is required on the smaller boats towing the kodiak. The townet, mid-water and Chipps trawl boat requires a winch and boom or frame to deploy and retrieve the nets.
- Currently, the boats being used for Kodiak trawling are fast, versatile and mobile 20-foot Boston Whalers. However, due to their size, these boats are not able to trawl under adverse weather conditions such as high winds. The mid-water and Chipps trawl boat currently being used is a slower, larger 32-foot vessel that is capable of towing under adverse weather conditions.

Efficiencies of Each Net

- The Kodiak trawl is effective in catching fish ranging in size from about 20 mm to 70 mm. The townet is effective in catching fish ranging in size from about 20 mm to 50 mm. The mid-water trawl and Chipps trawl tend to catch larger fish, ranging in size from about 50 mm to 90 mm.

- The Kodiak's greater overall effectiveness in catching delta smelt may be due in part to the method by which it is towed. The Kodiak net is towed between two boats and theoretically samples an area not disturbed by passage of the vessels. The townet, mid-water trawl net and Chipps trawl net are towed directly behind a boat. For surface oriented fish (which delta smelt are thought to be) this method would result in a greater degree of disturbance.

Results To Date

Comparisons between the Kodiak, townet, mid-water trawl and Chipps trawl have led to the following conclusions:

- The Kodiak trawl has a lower detection limit, that is able to catch delta smelt in areas where the other net types do not.

- Based on the same catch effort, the Kodiak catches significantly more delta smelt more consistently than the other net types.

In Summary

The Kodiak trawl is more effective at catching delta smelt than the other net types tested to date.