**Objectives**

The objectives of this data collection program included determining the relative abundance and distribution of rearing juvenile Chinook salmon and steelhead as well as providing baseline data for future monitoring programs associated with habitat restoration projects.

**Sampling Protocol**

This study was conducted using a hierarchical sampling design where the survey section represented the general location where a survey was done, and a survey unit represented the specific area within the survey section that was sampled (Level 1: Section, Level 2: Unit).

Two types of snorkel surveys were conducted over the period of record, comprehensive and section-based surveys. From 1999 through 2001 comprehensive surveys were conducted in addition to the section-based surveys. The comprehensive surveys were designed to cover a large extent of the lower Feather River in a relatively short amount of time. These early comprehensive surveys were generally conducted from the Fish Barrier Dam in downtown Oroville, downstream to the confluence with Honcut Creek. The data collected during the comprehensive surveys was limited to the number and size of the different species observed in each unit. The section-based surveys were conducted concurrently with the comprehensive surveys from 1999 through 2001 and were continued after the comprehensive surveys ended.

The section-based surveys are conducted each year between January and September at 20 sampling sections along the Feather River (12 in the Low Flow Channel and 8 in the High Flow Channel) as conditions and staffing considerations allowed. The survey metadata contain both a section number and name, though sometimes this information was not populated when a section beyond the permanent sections were sampled. At each section, snorkeling units were identified by aerial maps and transects were assigned to each snorkeler. Three to six divers are distributed along three transects (left side of river, right side of river, center of river). The center transect is typically done in the downstream direction because currents are too strong to swim upstream whereas the other transects along the riverbanks are done in the upstream direction. Often divers will complete multiple transects to ensure adequate coverage of each section. Divers use plastic slates to mark observations of fish. Environmental attributes were collected for each section though protocols do not specify where within the section these data were collected.

Attributes collected include species, number of fish of a given size (groups of similar sized fish that were observed in a 1 square meter or less, or are occupying similar habitat are treated as a single observation), substrate type (presence of every type of substrate is recorded), cover (presence of every type of cover is recorded), habitat type, approximate fork length (fish identification and size estimation are calibrated by training divers with tethered fishing lures in a controlled setting). The accuracy of size estimates is enhanced by comparing observed fish to nearby objects whose dimensions are measured using the scales mounted on plastic writing slates.

**Caveats**

There were some cases where survey sections could not be safely surveyed (e.g. high flow events) and other locations were chosen as substitute. These can be identified in the dataset as random survey sections and likely do not have a section name.

In the survey metadata, units covered represents the units surveyed though this field was not always recorded. The survey type represents if the survey was comprehensive or section/unit based. All surveys after 2001 are unit surveys. Section type represents whether the survey was for a permanent or random section. If this field was not recorded, it was assumed to be a random section.

This study relies on river miles for spatial information and the majority of observations can be associated with a river mile. Specific coordinates were not recorded for survey sections and units. DWR maintains a mapbook of the coordinates for all survey units which was digitized and included in this data package. The coordinates represent the centroid of the unit and shapefiles can be found in the attachments.

The methods throughout the study did not remain consistent and it is not well-documented when they were modified.

Section-based surveys conducted between 2004 and 2007 recorded the size of the observed fish using a size class bin assignment.

**Attachments**

Shapefiles for units are attached as well as a Kmz file to view survey units.