IEP Data Management Plan

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2026-012

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2026-01-01

Study Title
Shrimp Abundance and Distribution Survey (San Francisco Bay Study)

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Point of Contact

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Data Description
The San Francisco Bay Study was established in 1980 to monitor the effects of freshwater outflow on the abundance and distribution of fish, brachyuran crabs, and caridean shrimp in the San Francisco Estuary. Currently, the Bay Study samples 52 fixed stations monthly with trawl nets from south San Francisco Bay through the lower Sacramento and San Joaquin rivers. Data for the shrimp program element includes species, sex, counts, lengths, and presence of the branchial cavity parasite *Argeia*. Historically, we also recorded stomach contents (presence-absence) and egg and ovary stage data. From this data, we calculate monthly and annual abundance indices and regional CPUE for 7 shrimp species to track seasonal and annual abundance trends and distributional patterns.

Approximately 3 MB of shrimp data are added per year with the current data format. Note that in earlier years, shrimp data was recorded for more variables and consequently, more data was stored annually. The "master" shrimp file for 1980-2016 is approximately 154 MB. Note: the 2017-2023 data will be added in summer 2025, after the remaining sample QC checks and data edits are completed, while the 2024 shrimp data will be added in late 2025, after sample processing, sample QC checks, and data edits are completed.

Related Data
The station, tow, salinity and temperature, fish count and length, and crab count, sex, and size data are collected as part of the “Estuarine and Marine Fishes and Crabs Abundance and Distribution Survey”, which is program element #2026-011. Fish catch

and length, crab catch, sex, and size, and water column profile data (EC-Salinity-Temperature) are stored in separate MS Access files.

Metadata

Metadata and methods are found with the catch matrices on our FTP site, available for the public to download from the link shown below:

https://filelib.wildlife.ca.gov/Public/BayStudy/CatchMatrices/

Additional metadata is in the shrimp MS Access file Table and Field properties. Other metadata (project history, equipment descriptions, sampling protocol, analytical procedures, etc.) can be found in Bay Study SOP, available from the Point of Contact.

Storage and Backup

The Bay Study's shared databases, such as the annual shrimp entry file, are stored on the local Stockton server, which is backed up to remotely several times a day. Serial backups of annual and "master" data files are also stored on an external hard drive that is stored in an off-site safe. In addition, data is uploaded annually a Tier 3 CDFW server. Other working files are stored on staff computers, with the most important files backed up to the Stockton server or OneDrive and flash drives that are stored off site.

The Tier 3 server is maintained by CDFW and Resources Agency IT staff. It is our understanding that the Tier 3 server is backup several times a day to a secure location. We use this as a back-up, not an archive, as we have only one version of each file stored on this server.

Archiving and Preservation

Archived copies of MS Access databases, including serial backups, and relevant working data files are stored on the local server, staff computers, and an external drive that is stored in an off-site safe. All historical data sheets are stored in the Stockton office, either in file cabinets in the office or file totes in the warehouse. None of the Bay Study shrimp data sheets have been digitized. However, since 1999, the shrimp data has been direct entered into the MS Access database, such that hard copy data sheets are not needed.

Format

Data is recorded directly into a MS Access database in the lab as the shrimp samples are processed. With Direct Entry, there are no hard copy data sheets with hand-recorded data. After a year's samples are processed, QC checked, and the data edited, the length data is converted from one length per record to length frequency data and the sample, catch, and length-frequency data is transferred to a "master" shrimp MS Access data file with data from 1980 to current.

A shrimp catch matrix is produced annually in MS Excel. Excel is also used for the calculation of annual abundance indices and data summaries, such as seasonal abundance and distribution.

Most of the shrimp MS Access files are still in Access 2000 or 2002 (.MDB), but we have been able to open and work with them in the current version of Microsoft 365 without conversion. Excel files are .XLSX.

Quality Assurance

Staff who process the shrimp samples undergo rigorous training in the lab, with specific requirements for correct identification, sexing, and measurement before they "graduate" to processing samples without a QAQC check. The MS Access entry data base does not allow for certain types of entry errors, such as length out of range for the species, or produces a warning.

Through a series of MS Access queries, Excel pivot tables, and data visualization in R, the shrimp data is checked for outliers - distribution, size by species, sex, and season and missing data, such as the plus count, and other errors.

For trained staff, 5 to 10% of their samples are QC checked, which involves identification and counts for the entire sample by another trained staff person. In addition, the sex and size of shrimp that appear to be outliers are also checked.

Access and Sharing

The shrimp catch matrix is available for download on the public FTP site, https://filelib.wildlife.ca.gov/Public/BayStudy/CatchMatrices/. Files are updated and available within 3 to 4 months after a year's samples are processed and QC checked, which is usually 6 to 8 months after sampling is completed for the year. The master shrimp MS Access file and the annual abundance indices are available to the public, upon request (Point of Contact above).

Rights and Requirements

We ask of data users: "If you use any of these data in a paper, report, or presentation, please acknowledge California Department of Fish and Wildlife's San Francisco Bay Study and the Interagency Ecological Program for the San Francisco Estuary." The Read Me files for the matrices includes the disclaimer: "The California Department of Fish and Wildlife makes no warranty of the accuracy, completeness, or fitness of this data for any use. The Department assumes no liability for damages arising from errors, omissions, or the use of this information. Users of these data are advised to be aware of the locational accuracy, data collection dates, compilation methods, and cartographic format applicable to these data. Users are advised to use these data appropriately. This disclaimer shall apply to any authorized or unauthorized use and transfer of all or parts of these data."