# Two Data Sources for Commercial Passenger Fishing Vessel Catch and Effort Information (2017)

The California Department of Fish and Wildlife (CDFW) manages many diverse recreational fisheries targeted by commercial passenger fishing vessels (CPFVs, also commonly called party or charter boats) along California's coast. For each target fishery, CDFW fisheries managers use the data source(s) that best capture the dynamics of that unique fishery. This document describes two data sources: (1) CPFV log data and (2) California Recreational Fisheries Survey (CRFS) data and estimates (which incorporate CPFV log data). This document also identifies some of the strengths and limitations of these two data sources for making fisheries management decisions.

CPFV log data have been collected in a similar manner since 1936. They provide self-reported data on effort and catch from CPFV captains.

CRFS estimates use the effort data from CPFV logs (number of angler-days) and a listing of confirmed CPFV fishing trips from the CRFS effort survey to determine the compliance fraction (the percent of confirmed trips identified in the CRFS survey that submitted logs). Data for catch rate and average weight come from a creel survey that is conducted either onboard CPFVs at-sea or dockside at the end of the fishing trip. Measurements of released fish are obtained from the onboard location survey and are used in the average weight calculations. The effort, catch rate and average weight estimates are combined to produce estimates of total catch (kept and released fish) in both numbers of fish and total weight of the catch (see Figure 1).

Commercial Passenger Fishing Vessel Logs - Some strengths and limitations of the CPFV logs for fisheries management are:

- Strengths
    - Provide long-term trend information.
    - Allow widespread coverage.
    - Useful source of effort information on the number of angler-trips. Comparisons of CPFV logs for trips sampled by CRFS show good agreement for the number of anglers.
    - Provide information on the number of finfish and invertebrates caught and the number released on a boat trip-by-trip basis.
    - Provide information on dive trips.
    - Provide information on trips where California-based CPFVs fished in Mexican waters.
    - For species listed on the paper logs, fish with low catch rates (e.g., pelagic sharks, sturgeon), pulse fisheries (e.g., tunas), fish caught on dive trips and fish caught in Mexican waters, the logs may offer better coverage than CRFS on the number of fish caught and released.
    - Provide general location (10-by-10 nautical mile block) where most of the fish were caught or most of the fishing effort occurred on a trip-by-trip basis for a large number of trips.

- Limitations
    - Logs do not provide a complete accounting of all trips, because operators do not submit logs for all trips. While submission of CPFV logs is mandated by law, there is not full compliance. Several studies have estimated that no logs are ever submitted for about 15 to 20 percent of the trips. Thus, logs provide an index over time rather than a full accounting of catch.
    - Paper logs do not provide species-specific information for all species. For example, most rockfish are grouped into a single category, “unidentified rockfish”. Species not listed on paper logs may be under-reported. (All species are available for operators to select in the electronic logs).
    - Logs do not provide length or weight data.
        - These data are needed to estimate total weight of the catch. Weight is used for harvest limits for federally-managed species and some state-managed species.
        - Weight data are valuable in stock assessments.
    - Logs do not provide spatially explicit data.
    - Logs may provide an incomplete accounting of catch for some species. It is difficult for the captain and crew to accurately count the number of fish caught or released on trips with large number of anglers or high catch rates.
    - The log system can be slow to accommodate changes in data needed for fisheries management, because modifying logs requires amending regulations which can be a lengthy process.

<u>California Recreational Fisheries Survey (CRFS) CPFV Estimates</u> - Some strengths and limitations of the CRFS estimates for fisheries management are:

- Strengths
    - Provide species-specific information.
        - Sampler-verified catch composition.
        - Sex of some species.
    - CRFS gathers length and weight data on kept and released fish.
        - Weight data are used to estimate total weight of the harvest. Some state-managed species and all species managed under the federal Pacific Fishery Management Council (PFMC) umbrella have harvest limits in total harvest weight.
        - The stop-by-stop data are our only source of length and weight information for released fish.
        - Length data are used to develop size limits. Sizes of released fish can also be used to estimate the impacts of size limits on discard rates.
        - Length data are used in stock assessments.
    - Provide individual angler catch rate data for bag size analyses used to set bag and possession limits.
    - Provide spatially explicit information.
        - The stop-by-stop catch data (with corresponding GPS coordinates) are used to generate indices for stock assessments, and have proven

valuable for assessment of nearshore species (e.g., brown rockfish, China rockfish and copper rockfish) because of the lack of comprehensive fishery-independent surveys in nearshore waters.
    - Provide depth and descending device use data for released groundfish that are used in calculating depth-dependent mortality estimates as requested by PFMC.
    - CRFS randomly samples anglers to determine catch rate rather than relying on a tally of all fish caught and released which can be difficult for the captain and crew to accurately report on a busy trip.
    - CRFS was designed to meet the needs of fisheries management and has the ability to adjust to changing data needs for fisheries management.
    - CRFS CPFV sampling design and estimation procedures have undergone rigorous independent peer review.
    - Provide data on a weekly basis to the CDFW groundfish management team for calculations of anticipated catch values used to supplement forthcoming CRFS estimates for in-season tracking of harvest limits and quota fisheries.

- Limitations
    - When compliance of log submission is low, the uncertainty of the effort estimates increases.
    - Catch rates may be biased if a sufficient number of anglers aren't sampled or if the sampled trips aren't representative of the fishery.
    - CRFS doesn't sample onboard multi-day trips or trips to Mexico and doesn't conduct dockside samples at night. Thus, CRFS likely under-samples trips targeting highly migratory species which makes those estimates less reliable.
    - CRFS does not sample dive trips.
    - CRFS' focus is on collecting data on saltwater angling trips targeting finfish. When encountered, data on invertebrate trips are gathered, but no estimates are made for invertebrate species or invertebrate effort.
    - The random sampling design of CRFS may miss rare events or pulse fisheries which may be captured by the logs.
    - Self-reported information from anglers is used to estimate release per unit effort.

Summary

No single data source is "best" under all circumstances. CPFV log data and CRFS CPFV data and estimates have inherent strengths and weaknesses for managing the various target fisheries of California's CPFV fleet. As noted in the preceding text and in the diagram on the following page, CDFW uses multiple data sources to produce the most accurate and precise catch estimates possible for managing the fisheries targeted by CPFVs. CDFW fisheries managers make their decisions to use either CPFV log data or CRFS estimates to estimate CPFV catch based on which data source will best capture the dynamics of the fishery in question.

**Figure 1. Components of CRFS CPFV Catch Estimates**