

## **US commercial and recreational fleets catch and associated composition data**

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### **Abstract**

The time series of seasonal catches from US commercial and recreational fleets are provided. Catch from commercial fleets are given in tons and recreational fleets in 1000's of fish. The recreational fleet is dominated by the Commercial Passenger Fishing Vessels (CPFV) fleet. In recent years, the catch from private boats for recreational fleets has increased due to the warmer than average waters in the Eastern Pacific Ocean (EPO) as well as improvement of sampling. Catch estimates for private boats were retrieved from the Recreational Fisheries Information Network. A new NOAA biological sampling program conducted for recreational fleets was also used to provide raised observations of length compositions for the most recent years. Catch for both the US recreational and commercial fleets should be considered best available data and used in the next stock assessment. The new estimate of length composition of the recreational catch is appropriate for use in the stock assessment; however, some consideration of parsimony (prevention of fleet proliferation) should be given.

### **Introduction**

Two general fleet types fish for Pacific bluefin tuna (PBF) on the west coast of the United States. The US recreational fishery for PBF has become the most important US fishery in recent years due to a decline in US purse-seine catches of PBF after the 1970's from the exclusion of US vessels from Mexican waters.

The recreational fleets are dominated by the Commercial Passenger Fishing Vessels (CPFV), which operate as for hire charters and fishing takes place in both US and Mexican waters. In recent years, the catch from private boats for recreational fleets has increased due to warmer than average waters in the eastern Pacific Ocean as well as improvement of sampling. Commercial purse seine activity is primarily opportunistic fishing that takes place only when PBF move northward due to oceanic conditions.

In the 2014 stock assessment conducted by the ISC Pacific bluefin working group (ISC, 2014), the units used for the catch of PBF from the US purse seine fishery and US recreational fishery were metric tons and thousands of fish, respectively, as this is the native metric recorded. Size composition data are not generally available for the limited catches of the US commercial fleet. Size samples of the US recreational catch have been provided by the Inter-American Tropical Tuna Commission (IATTC), however, these size composition data were not used as a likelihood component in the 2014 stock assessment. A new NOAA-based length sampling program was initiated in 2014. In this paper, we summarize 1) the catch for US commercial and recreational fisheries and 2) the raised observations of length compositions for the most recent years.

## Materials and Methods

### 1. Commercial catches

Catches were recorded in metric tons and taken from fish ticket (offloading receipts) data collected by state governments and housed in the Pacific Fisheries Information Network database (PacFIN).

### 2. Recreational catches

Recreational catch were calculated as the sum of the number of PBF caught and recorded in logbooks from the Commercial Passenger Fishing Vessel (CPFV) fleet, vessels licensed by California Department of Fish and Wildlife (CDFW) to take paying passengers on sport fishing trips based in California to waters off California and Mexico, and the number of PBF caught by anglers on non-CPFV (i.e. private) vessels from the Recreational Fisheries Information Network database (RecFIN) ([www.recfin.org](http://www.recfin.org)).

Private boats catch were based on an integrated state and federally funded sampling program (California Recreational Fisheries Survey, CRFS) conducted since January 2004, which sample the fishing trips at the locations where anglers complete trips. Before 2004, the National Marine Fisheries Service began conducting a national survey (Marine Recreational Fishery Statistics Survey, MRFSS) in 1979, which used random digit dialing (a survey of dialing telephone numbers to obtain participation and effort data).

### 3. Recreational size composition

There are three main periods of size sampling for the CPFV fishery: (1) 1993-2012 – IATTC sampling; (2) 2013 – No sampling; and (3) 2014 onwards – NOAA sampling. A basic overview of the NOAA sampling is given in Appendix 1. In this paper, we raised sampled length composition by catch in number within months. Seasonal observations of length composition are sums of the raised monthly length compositions.

## Results

Annual US commercial catch of PBF after 2009 is given in Figure 1.

Annual US recreation catch of PBF after 1983 is given in Figure 2. The major discrepancy caused by the between the updated recreational catch and recreational catch from 2014 assessment is to include the private boats catch estimates.

Annual length compositions of the recreational catch (2014 and 2015) are given in Figure 3.

## Discussion

Catch for both the US recreational and commercial fleets should be considered best available data and used in the next stock assessment. Catch from US commercial fleets and recreational fleets are most appropriately modeled as weight and numbers, respectively.

The new size sampling program for the recreational fleet and the weighting of composition data provide good size composition estimated from the catch. However some consideration should be given to both the short series of this data and the importance of

including additional composition data in the model (proliferation of fleets and associated misfit to the fleet composition data).

Our recommendation for the US commercial fleet selectivity is that it is best borrowed from the Mexican purse seine fishery due to limited catches. Using this same selection pattern to represent the recreational fleet (for parsimony) may be appropriate. Alternative model run (sensitive run) adding two-year weighted composition data is suggested to explore the consistence of the borrowed selectivity assumption.

#### **Literature Cited**

ISC. 2014. Stock Assessment of Pacific Bluefin Tuna 2014. Report of the 2014 Intercessional Meeting of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean - Annex 4. [http://isc.ac.affrc.go.jp/reports/stock\\_assessments.html](http://isc.ac.affrc.go.jp/reports/stock_assessments.html)

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## US COMMERCIAL FISHERIES

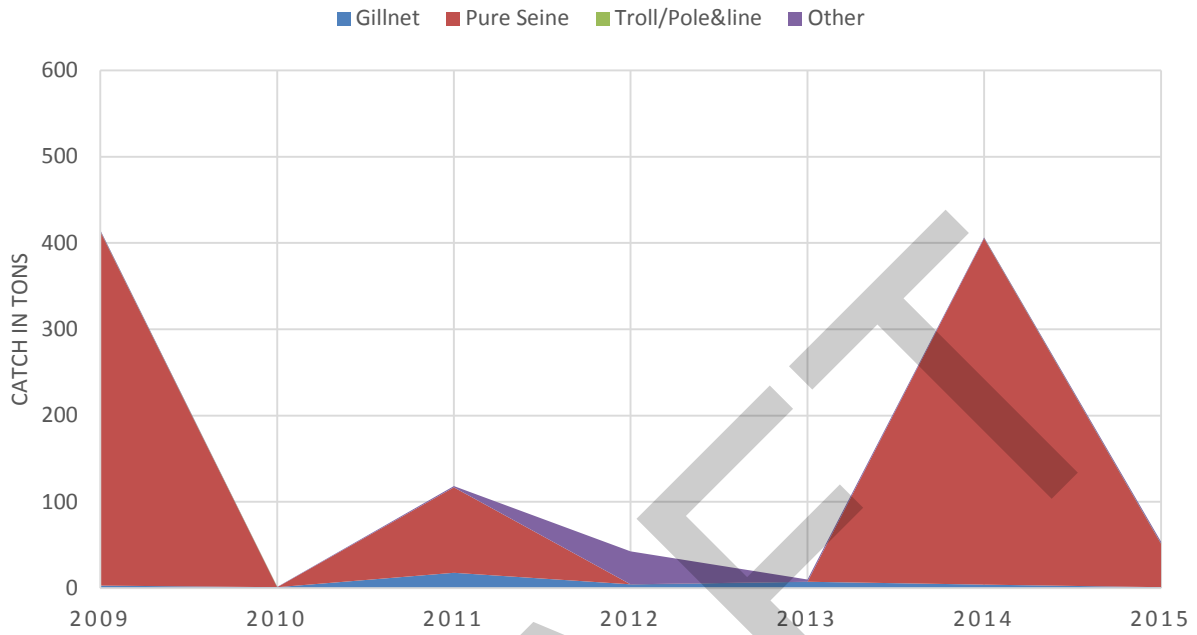


Figure 1. Annual (calendar year) US commercial catch of PBF (in metric tons). The 2013 estimates were preliminary with only two quarters of catch. The 2015 estimates were preliminary. Catch time series before 2009 are the same as the US commercial catch from 2014 assessment (ISC 2014).

## US RECREATIONAL FISHERIES

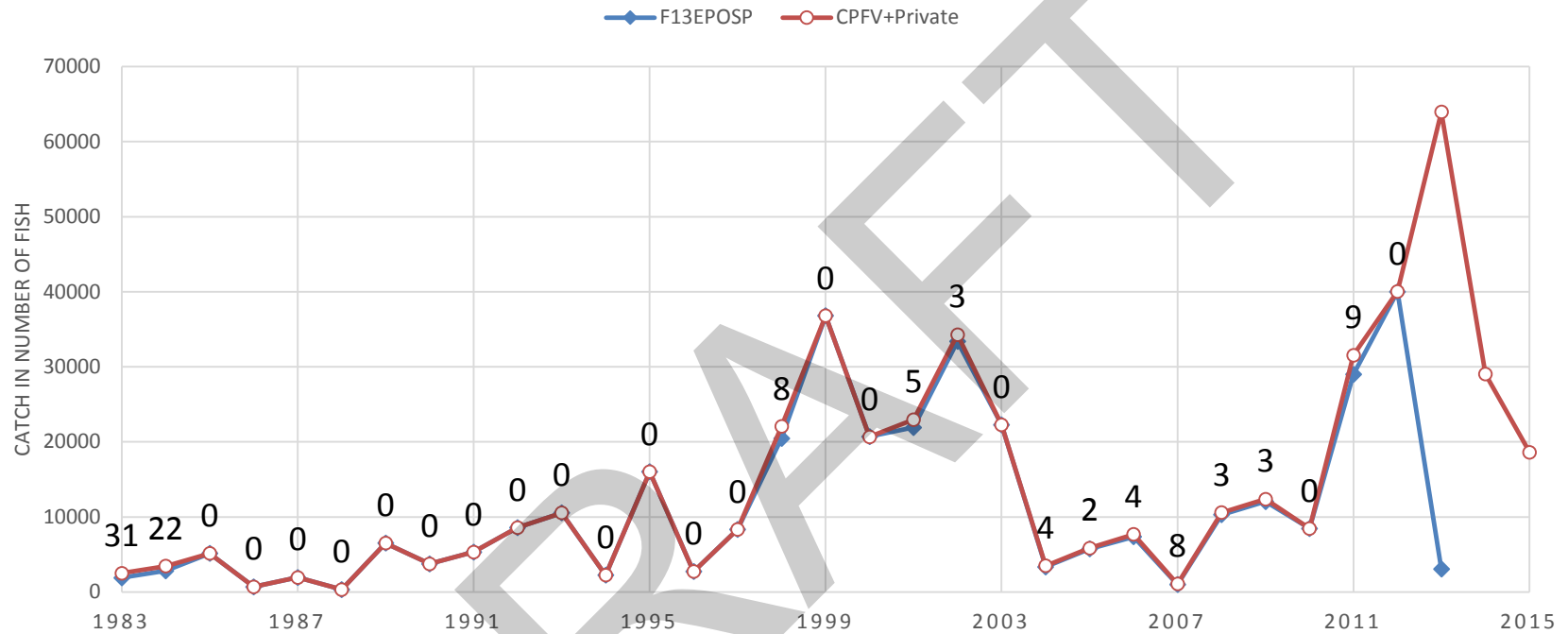


Figure 2. Annual (calendar year) US recreational catch of PBF (in number of fish), where F13EPOSP (CPFV only) represents the recreational catch from 2014 assessment and CPFV+Private represents the updated recreational catch. The number above the line shows the percentage difference of recreational catch from 2014 assessment. The 2015 estimates were preliminary with only two quarters of catch. Catch time series before 1983 are the same as the recreational catch from 2014 assessment (ISC, 2014).

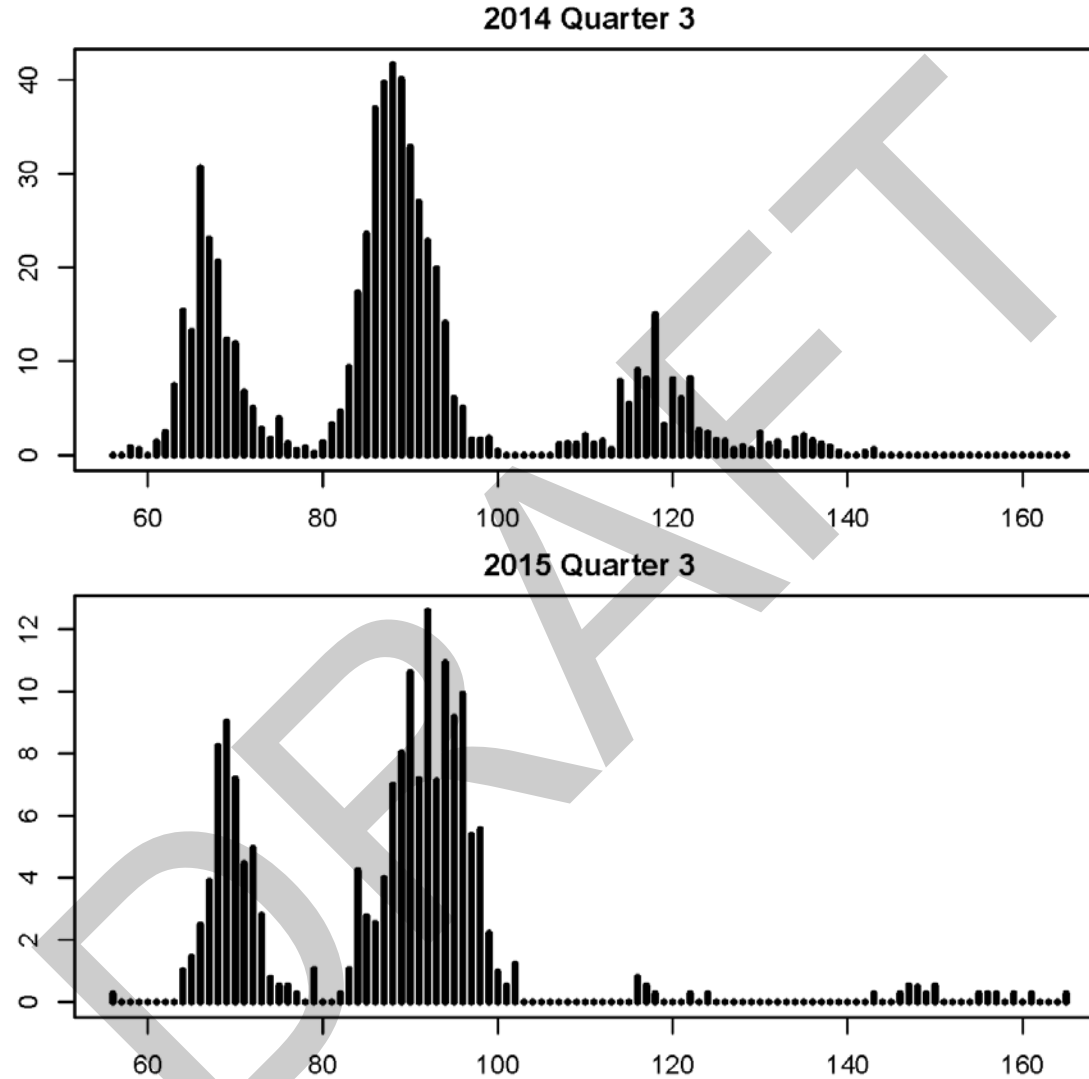


Figure 3. Quarterly length compositions (fork length in cm) of the recreational catch (2014 and 2015 in calendar year), where length composition were weighted by catch in number within months.

## Appendix 1.

### Sample selection procedure:

- 1) On each sampling day, identify 2-3 boats to sample**
  - At the docks, boats will unload catch onto their respective landing and organize fish by angler number; identify boats to sample by visual confirmation of PBF
  - At the processor, fish will be kept under ice in totes with vessel name identified on the side; tuna may be visibly present, or catch totals will be listed on a white board
- 2) If 20 or fewer bluefin were caught on a single boat-trip, measure all fish**
- 3) If greater than 20 bluefin were caught on a single boat-trip, measure up to a maximum of 30 randomly-selected fish per boat-trip**
  - Once all boat catch is unloaded and organized, randomly select angler numbers to sample (every 5, odds or evens, etc.) and measure all PBF tuna\* at selected number (cone at docks, pile at processors) regardless of size

*\*Attempt to measure all PBF by angler number before jackpot selections are withdrawn for weighing.*

### Sampling procedure:

- 1) Measure PBF straight fork length (FL) to the nearest tenth of a centimeter**
  - Lay tuna on side, ensure the jaw is intact, mouth closed, and body is as straight as possible (sometimes tail will be frozen and curved upwards or sideways)
  - Place the permanent fixed caliper bracket at the tip of the snout and slide the moving bracket down to the fork in the caudal fin. Do not allow bracket to compress caudal tail and bring the caliper as close to fin's true resting position as possible
- 2) Record FL on data sheet under respective trip**
  - If need be, keep track of which fish have been measured by clipping the tip (no more than 2 cm.) of the pectoral fin on the tag side with shears
- 3) Record and validate trip metadata**
  - Sampling date, location (docks or processors), sampling location name, vessel name, trip type (short- or long-range), trip length (number of days), trip start date and end date, total PBF landed<sup>†</sup>, and total PBF measured should be recorded for every sampling event

*†Catch totals can be accessed online, at the landing offices, or by speaking to the captain or deckhands on site. Be wary of various versions of answers and validate your findings with multiple sources, including vessel logbooks.*

### Data entry procedure:

- 1) Day of sampling, enter the length frequency data into the PBF Access Database**
  - For each sampling event, a "Trip ID" will be created using metadata and logbook information
  - Transcribe all data fields into appropriate tables, using the given vessel codes