# Estimating Red Snapper Harvest by Charter Boats in the Gulf of Mexico

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**Keywords:** abundance; capture-recapture

**Abstract:**
A year-long for-hire study conducted by the National Marine Fisheries Service of catch by charter boats in the Gulf of Mexico allowed for estimation of expected Red Snapper harvest from two data sources: logbook and dockside reports. The former contained information reported directly by vessel captains and the latter required hiring port officials to verify catch quantities. We defined an estimator for expected harvest, $\tau$, where $\tau = N\psi\gamma$ is a function of the expected number of trips $N$, expected effort $\psi$ in hours spent fishing, and the expected catch per unit of effort (cpue) $\gamma$ in numbers. We employed a Bayesian approach to estimate $\tau$ and obtained 95% credible intervals directly from the quantiles of the posterior distribution. A posterior predictive distribution of $\tau$ was computed by multiplying samples from posterior predictive distributions of expected cpue, expected effort, and expected number of trips. Selecting a distributional form for effort was complicated by the presence of extreme values while the distributional form for cpue was complicated by a high peak in the data with scattered larger values present. Additional verification sampling was conducted to estimate the percentage of compliance for estimation of expected number of trips. Credible intervals of weekly and cumulative expected harvest during the Red Snapper harvest season, June $1^{st}$-July $18^{th}$, 2011, from logbook reports and dockside reports largely overlapped. Overall, logbook reports provided comparable results and narrower credible intervals to the more reliable dockside reports.

## References

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