Size Distribution of Vermilion Snapper Discards Observed from For-Hire Recreational Vessels in the Eastern Gulf of Mexico

Beverly Sauls

SEDAR45-WP-07

6 November 2015
Updated: 24 November 2015

Please cite this document as:

Sauls, B. 2015. Size Distribution of Vermilion Snapper Discards Observed from For-Hire Recreational Vessels in the Eastern Gulf of Mexico. SEDAR45-WP-07. SEDAR, North Charleston, SC. 8 pp.

Size Distribution of Vermilion Snapper Discards Observed from For-Hire Recreational Vessels in the Eastern Gulf of Mexico

Prepared by:
Beverly Sauls
Florida Fish and Wildlife Conservation Commission
Fish and Wildlife Research Institute
Saint Petersburg, FL

For: SEDAR 45 Gulf of Mexico Vermilion Snapper Data Workshop, November, 2015.

Detailed information on the size of discarded fish is not collected in traditional dockside surveys of recreational fisheries. At-sea observer surveys provide valuable information on the size and condition of discarded fish. Such surveys have been conducted on headboat vessels in the eastern Gulf of Mexico since 2005. Coverage was expanded in June of 2009 to include charter vessels on the east coast of Florida, and this coverage continued through 2013. This report provides a summary of available information on the size and catch-per-unit-effort for Vermilion Snapper discards collected from headboats and charter boats from the Gulf coast of Florida.

Coverage

Fishery observer coverage for headboats and charter boats operating on the Gulf coast of Florida is summarized in Table 1. From 2005-2007, at-sea observer surveys were conducted on headboats only from Alabama through Southwest Florida (Figure 1); however, funding was discontinued in 2008. A new funding source allowed coverage to resume on both headboats and charter boats over a reduced area (A, B and C in Figure 1 and Table 1) from June 2009 through December 2013. Caution is recommended when using at-sea data from 2014. During this year, funds were only available to sample a sub-set of headboats (9 vessels in Florida) that were participating in the Gulf Headboat Collaborative IFQ Program, which is a pilot program for a small group of vessels in the Gulf that were allocated a separate fishing quota for Red Snapper and Gag that may be harvested throughout the year (under an exempted fishing permit). Due to a lapse in funding for charter vessels in 2014, there was no sample coverage during the first five months of the year, 16 trips were sampled in June during the Federal recreational season for Red Snapper, and full sample coverage was not resumed until October, 2014.

Table 1. Fishery observer coverage for headboats (H) and charter vessels (C) on the Gulf coast of Florida. Refer to figure 1 for areas.

Area	2005	2006	2007	2008	2009*	2010	2011	2012	2013	2014**
NW panhandle (A)	H	H	H		H, C	H, C	H, C	H, C	H, C	H,C
TB nearshore (B)	H	H	H		H, C	H, C	H, C	H, C	H, C	H,C
TB offshore (C)	H	H	H		H	H	H	H	H	
Naples/Ft. Meyers (E)	H	H	H							C

*Sampling did not resume until June.

**Sample coverage for headboats limited primarily to vessels included in the Gulf Headboat Collaborative. Temporal coverage for charter vessels was limited to the month of June (federal Red Snapper season only) and the months of October through December.

Cooperative vessels were randomly selected year-round for observer coverage, and samples were stratified by region (Figure 1). Operators from selected vessels were contacted by state biologists and one or two observers were scheduled to sample a single trip in a selected week. Monthly sample quotas were assigned to two trip types in areas A and B: 1) single day charter trips and 2) single day headboat (large party boat) trips. Monthly sample quotas for a third trip type, multi-day (>24 hour) headboat trips, were assigned in area C. For trips with 15 or less passengers, only one observer accompanied passengers during the scheduled trip. Area D, the Big Bend region, was not routinely sampled due to the small number of charter boats (and no headboats) that target reef fishes offshore and the infrequent nature of trips; however, observers were able to conduct a small number of trips in this region.

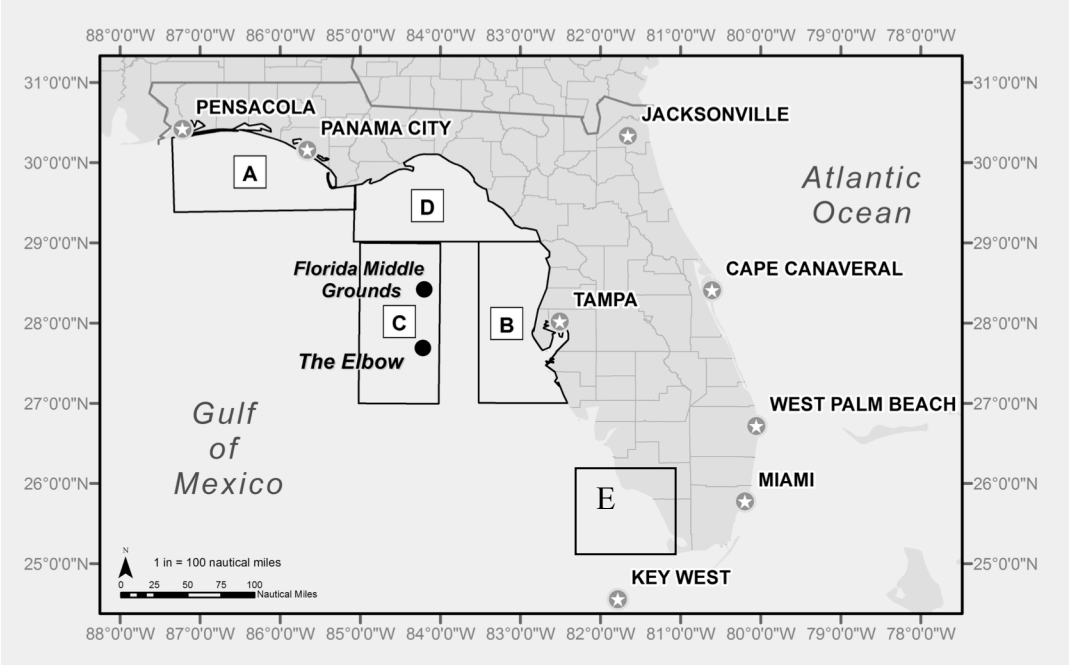

Figure 1. Study areas in Florida. Box A represents the area where half-day and full-day trips originating from the northwest panhandle region (NW) took place, Box B represents the area where half-day and full-day trips originating from the Tampa Bay region (TB) took place, Box C represents the area where multi-day trips originating from the Tampa Bay region (TB) took place. Box E is the area where headboats based in Naples/Fort Meyers operate.

Data Elements:

All sampled trips

Trip level data are available for all regions and years of observer coverage (Table 1). Trip level information for each sampled trip includes:

- Year, month and day of trip
- duration of trip (to the nearest half hour)
- duration of time spent fishing (to the nearest half hour)

- total number of anglers on board
- number of anglers observed
- minimum and maximum depths fished

For each location fished during a sampled trip, the following station-level information was recorded:

- latitude and longitude (degrees and minutes)
- fishing zone and subzone (same as commercial zones)
- bottom depth (meters)
- up to three target species and percentage of time targeting each

For each angler observed during a sampled trip, the following information was collected:

- total number of fish retained by species
- total number of fish discarded alive by species
- total number of fish discarded dead by species

For each rod fished by an observed angler at a given station, the following information was recorded:

- leader type and strength
- hook type (circle hook, J hook, kahle hook, treble hook, other)
- hook offset (yes or no)
- hook size (using a standard hook sizing chart)
- bait type (live, whole dead fish, cut fish, squid, cocktail, artificial)

For each fish observed from a given rod at a given station, the following information was recorded:

- species
- mid-line length (mm)
- disposition, coded as:
    - 1: thrown back alive, legal
    - 2: thrown back alive, not legal
    - 3: plan to eat
    - 4: used for bait or plan to use for bait
    - 5: sold or plan to sell
    - 6: thrown back dead or plan to throw away
    - 7: other
- method of hook removal (easy or difficult; by hand, dehooking tool, pliers, or left in place)
- presence of barotrauma symptoms (inflated bladder, everted stomach, extruded intestines, exopthalmia)
- venting method (released without venting, bladder vented, stomach vented)
- presence of gill injury (visible bleeding from gills)

Sample Weights:
The sample design for this survey does not account for various trip-types offered by vessels selected for observer coverage. Single-day trip-types include half-day (<6 hours from departure to return), ¾-day (defined as 6 to <8 hours through 2012, and 6 to <7 hours after 2012), and full-day (9 or more hours through 2012, and 8 or more hours after 2012). Multi-day trips include any trips that are more than 24 hours in duration. To generate weighting factors for different trip-types, fishing effort data for the years 2009 through 2013 were used to calculate proportional effort by trip-type. For example, multi-day headboat trips were sampled at a much higher rate (between 20% and 30% of samples, versus approximately 1% of headboat effort) and weighting is necessary to account for this oversampling (Figure 2). Headboat vessels report fishing effort in logbook trip reports, and effort data from the two study regions in the Gulf of Mexico were provided by the NMFS Southeast Fisheries Science Center in Beaufort, NC. Effort data for charter vessels is collected through the For-Hire Survey component of the Marine Recreational Information Program, which a weekly vessel directory telephone survey of charter boat operators (Van Voorhees et al. 2002). Proportional fishing effort was calculated as the total number of trips in the Gulf of Mexico reported for a given trip-type (N_t) divided by the total number of Gulf trips reported (N). To obtain the sample weight (W_t), proportional effort was then divided by the proportion of a given trip type in the sample population (n_t/n):

$$W_t = (N_t/N) / (n_t/n) \qquad \text{Equation 1}$$

where n_t is the number of trips of type t in the sample population, and n is the total number of sampled trips. Trip-types with $W_t < 1$ are down weighted to account for oversampling and trip-types with $W_t > 1$ are inflated to account for undersampling. Numbers of headboat trips and charter trips sampled per year are provided in Tables 2 and 3, and calculated sample weights are provided in Tables 4 and 5.

Table 2. Numbers of headboat trips sampled each year by trip-type. For years with asterisks, refer to Table 1.

Trip-type	2005	2006	2007	2008	2009*	2010	2011	2012	2013	2014**
Half day	22	30	26		8	13	30	35	38	12
¾ day	75	84	79		42	48	66	57	23	30
Full day	16	15	12		13	21	7	5	30	73
Multi-day	19	23	23		9	12	16	12	11	0
Sum	134	152	141		72	94	119	109	102	115

Table 3. Charter at-sea observer trips sampled per year. For years with asterisks, refer to Table 1.

Area	2005	2006	2007	2008	2009*	2010	2011	2012	2013	2014**
NW FL (A)					38	62	79	78	79	33
TB FL (B)					18	40	50	48	51	16
SW FL (D)										2

Table 4. Sample weights (W_{ay}) by year and trip type for Headboat vessels.

Year	Half day	3/4 day	Full day	Multi-day
2005	1.818	0.914	1.470	0.102
2006	1.590	0.992	1.157	0.156
2007	1.901	0.927	1.394	0.070
2008				
2009	3.639	0.879	0.400	0.087
2010	2.968	0.987	0.321	0.109
2011	1.663	0.947	0.739	0.089
2012	1.276	1.004	1.074	0.145
2013	1.004	1.253	1.110	0.157
2014	3.805	1.038	0.495	

Table 5. Sample weights (W_{ay}) by year and trip type for Charter vessels.

Year	Half day	3/4 day	Full day
2009	6.391	0.766	0.350
2010	2.523	0.688	0.599
2011	2.186	0.619	0.563
2012	2.614	0.602	0.504
2013	1.470	0.687	1.055

Size Distribution of Discards

Sample sizes for numbers of sampled trips with vermilion snapper discards and numbers of discards measured are provided in Table 6. Individual fish were assigned to one cm length bin categories (40 cm bin = fish 39.5 cm to 40.4 cm). The numbers of fish in each length bin category were summed by disposition (harvested, released), and multiplied by appropriate sample weights. Length distributions of discards observed from head boats are shown in Figure 2 and charter vessels are shown in Figure 3.

Table 6. Sample sizes for vermilion snapper discards.

	Headboat		Charter	
Year	Positive trips	Number measured	Positive trips	Number measured
2005	56	829		
2006	76	1,389		
2007	57	559		
2008				
2009	23	106	14	31
2010	14	31	7	16
2011	21	69	19	53
2012	25	101	12	18
2013	17	58	11	24
2014	10	59	3	9

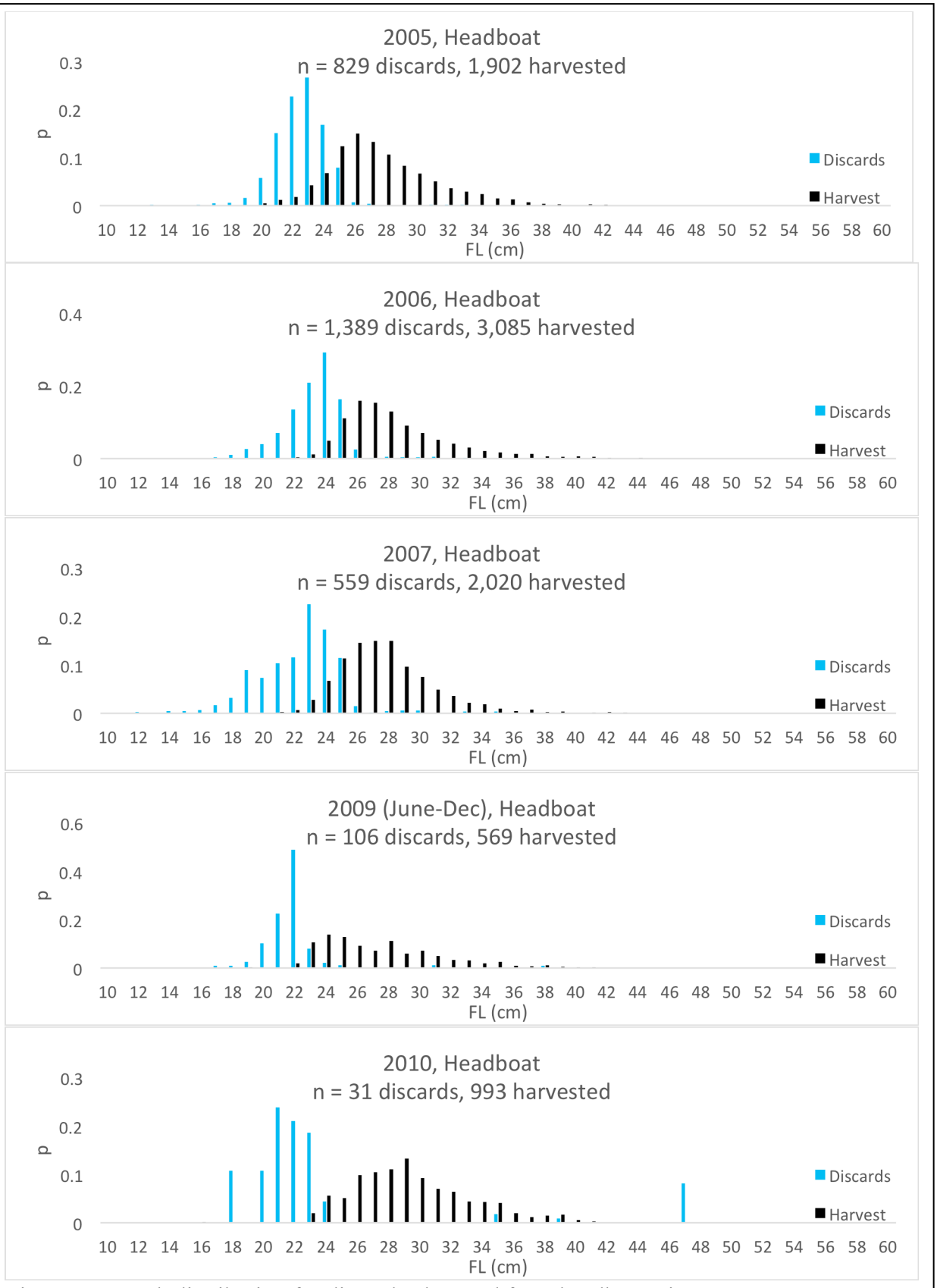

Figure 2. Length distribution for discards observed from headboat trips.

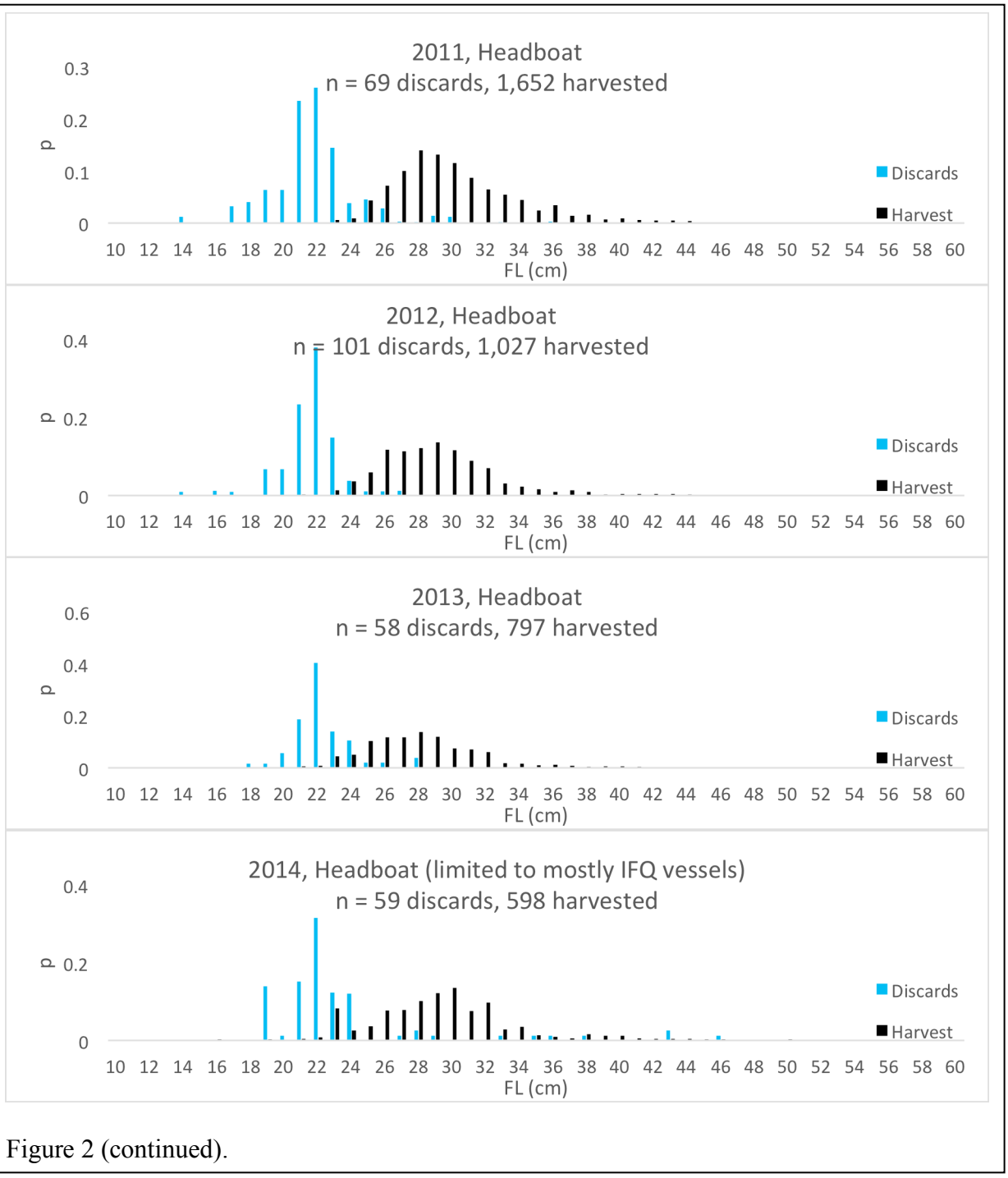

Figure 2 (continued).

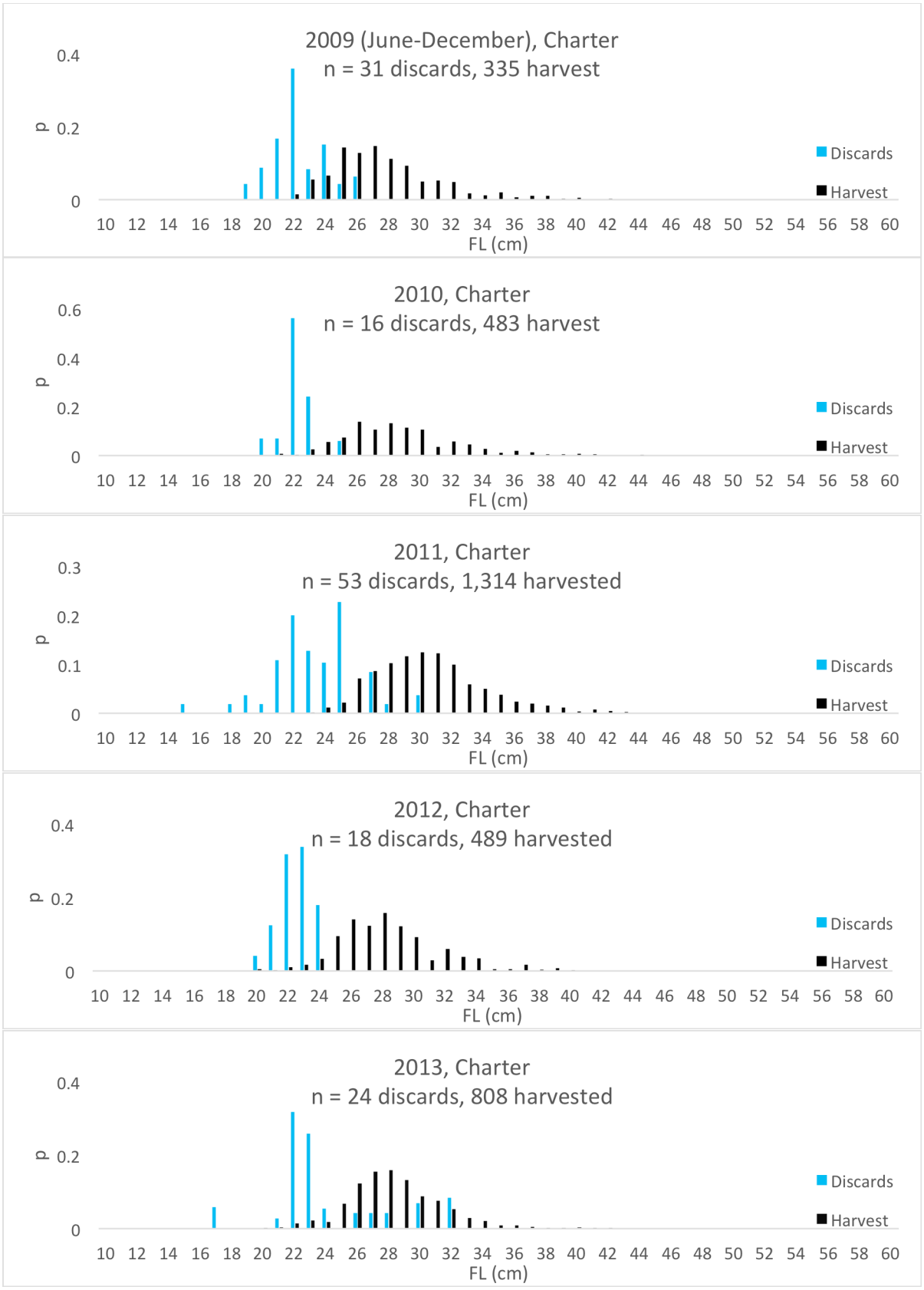

Figure 3. Length distribution for discards observed from charter trips.