Size frequency distribution of red snapper from dockside sampling of recreational landings in the Gulf of Mexico 1984-2002 (TXPW, MRFSS, and Headboats size data)

by

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Size frequency distributions of red snapper recreational landings were analyzed using Texas Parks and Wildlife (TXPW), Marine Recreational Fisheries Sampling Survey (MRFSS) and Headboats size data from 1984 to 2002. In the size frequency histograms presented in this document, the annual legal minimum size is shown as a solid black bar. Annual minimum legal size was defined based on regulations published in the Federal Register.

HEADBOAT SURVEY

Size data for all Gulf areas are available starting 1986. Fishing areas in the Headboat survey are described in Table 1.

Table 1: Description of fishing areas as defined in the Headboat survey.

Area	Description
12	FL Keys (Atl. based vessels)
17	Dry Tortugas (Keys based vessels)
18	Dry Tortugas (Gulf based vessels)
21	SW FL (Naples to Crystal River) - full trips
22	FL middle grounds
23	NW FL and AL (Carabelle - Pensacola in FL)
24	LA
25	NE TX (Sabine - Freeport)
26	Port Aransas, TX
27	Port Isabel - Brownsville, TX

Table 2 shows the number of red snapper sampled by the Headboat survey by year and area of fishing. Red snapper were mostly absent from headboat landings from the FL west coast and the Keys (areas 12, 17, 18, 21, and 22) while 99% of all sampled landings were recorded in areas 23-27 (FL panhandle - TX). Figure 1 shows the relative size frequency distributions of red snapper from areas 23 to 27 from 1986 to 2002. Generally, a higher proportion of larger fish were landed from the northern Gulf (areas 23 and 24) than from the western Gulf (areas 25-27).

Table 2: Number of red snapper sampled by the Headboat survey by year and area of fishing.

	Area of fishing										
Year	12	17	18	21	22	23	24	25	26	27	TOTAL
1986	1			3	20	145	237	1,789	2,488	1,739	6,422
1987		1		1		192	413	1,872	1,457	2,236	6,172
1988		1		1		195	551	692	1,754	1,714	4,908
1989				2	4	282	1,278	783	2,398	1,826	6,573
1990					3	335	715	877	1,080	1,612	4,622
1991		3	1			499	944	981	550	945	3,923
1992				1		725	2,086	3,404	1,139	1,529	8,884
1993		10				389	1,657	2,429	726	2,242	7,453
1994	6			510		810	854	2,577	991	2,219	7,968
1995		1				445	1,303	3,844	1,238	1,942	8,773
1996						499	1,060	2,210	761	1,213	5,743
1997						1,146	1,812	799	141	1,244	5,142
1998						2,159	2,198	2,122	1,542	752	8,773
1999	1			30	15	841	1,945	313	640	386	4,171
2000					5	1,131	2,723	29	123	321	4,332
2001					5	648	1,512	202	658	157	3,182
2002						1,252	934	83	765	591	3,625

Table 3 shows number of red snapper caught by length-of-trip category, year, and area (23 to 27). Fifty seven percent of all red snapper were landed from 3/4 day-full day trips, 26% from trips of unknown duration, and 16% from half-day trips. Figure 2 shows relative size frequency distribution of red snapper from 3/4-full day trips and half day trips in area 23 from 1990 to 2002. No consistent trend was observed.

Table 3: Number of red snapper landed from headboats from 3/4 day-full day (Full), half-day (½),multi-days (Multi) and unknown (unk) trip duration by year, and area.

	Area																		
	23				24				25				26				27		
Year	Full	1/2	Multi	unk	Full	1/2	Multi	unk	Full	1/2	Multi	unk	Full	1/2	Multi	unk	Full	1/2	unk
1986	16	5		124	184			53	1,008		15	766	544	60	78	1,806	819		920
1987	57	6		129	203			210	1,453			419	746		59	652	1,729		507
1988	120	12	7	56	322			229	425		9	258	1,398		169	187	1,374		340
1989	144	44	16	78	785			493	317		18	448	1,622	5	75	696	1,346		480
1990	182	78		75	523			192	679		14	184	896		34	150	1,509		103
1991	234	32	31	202	756			188	719	11		251	307	20	5	218	892		53
1992	394	139		192	1,356		28	702	2,976	39	33	356	728	125	28	258	1,235	10	284
1993	231	94	14	50	960		1	696	2,146		44	239	567	36	34	89	2,032		210
1994	499	195		116	581		24	249	2,324		48	205	673	81		237	1,666	371	182
1995	271	89		85	816		88	399	2,830		130	884	685	12		541	1,768	9	165
1996	267	90	15	127	468	12	32	548	1,531			679	474	8		279	1,155		58
1997	669	278		199	1,090	1		721	743			56	141				1,166		78
1998	1,344	201	13	601	1,346	6		846	1,742		30	350	940	6		596	546		206
1999	448	195		198	936			1,009	162		16	135	387	1		252	343		43
2000	605	176	20	330	915			1,808	24			5	64		6	53			321
2001	428	51		169	355			1,157	91			111	455	37		166	92		65
2002	626	113		513				934	70		4	9	520	24	14	207	503	26	62

TEXAS PARKS AND WILDLIFE SURVEY

The Texas parks and wildlife size data identifies 3 modes: headboat, charter boat, and private boat and 3 areas of fishing: inshore (#10 miles), offshore ($ 10 miles), and bays and passes. The sampling of headboats stopped in September 1984. The numbers of fish sampled for each area of fishing and mode by year are presented in Table 4.

Table 4: Number of red snapped sampled by the Texas Parks and Wildlife survey from 1984 to 2002.

	MODE				
	Charter boats		Private boats		
	Inshore	Offshore	Inshore	Offshore	Bays
1984		6	58	309	26
1985	41	53	108	460	45
1986		6	76	277	10
1987		229	82	315	36
1988	7	18	143	278	27
1989	6	3	108	199	19
1990	1	6	123	223	25
1991		15	228	273	23
1992	18	42	139	408	22
1993	24	4	228	539	16
1994	18	30	248	700	49
1995	21	14	276	996	56
1996	5	62	113	885	11
1997	6	51	248	1,051	9
1998	29	82	95	1,108	1
1999	24	71	219	482	3
2000	30	71	181	827	3
2001	30	300	162	691	3
2002		144	197	722	15

Seventy five percent (12,007 fish) of all red snapper sampled (both modes combined) were caught offshore ($10 miles). Figure 3 shows the relative size frequency distribution of red snappers caught inshore and offshore (both modes combined). Size distributions were similar. But, in general landings from offshore fishing areas have somewhat a higher proportion of larger fish and a greater number of fish measured than landings from inshore areas. Sample sizes from landings from bays and passes were too small to estimate size frequency distributions. Combining all years to increase the sample size is not recommended because of several changes in minimum size regulations during the period 1984-2002.

MARINE RECREATIONAL FISHERIES SAMPLING SURVEY

The Marine Recreational Fisheries Sampling Survey (MRFSS) defines fishing areas as 'ocean < 3 miles' (inshore) and 'ocean > 3 miles' (offshore) for the states of AL, LA, and MS. In the case of TX and FL, the boundary between inshore and offshore waters is 10 miles instead of 3. Fishing modes are defined as: shore, headboats, charter, and private boats. Table 5 shows the number of red snapper sampled by MRFSS in each area of fishing and mode for each state. Texas and headboat landings were excluded from MRFSS in 1986.

Most red snapper sampled were caught from offshore fishing areas by charter boats. Florida and Alabama had a higher number of fish measured than Mississippi and Louisiana. Sampling effort by MRFSS significantly increased after 1998.

MRFSS sampled fish from FL were initially divided into 'panhandle landings' (Escambia-Franklin counties) and 'west FL landings' (all counties east of Franklin county). Ninety eight percent (24,489 fish) of all FL red snapper landings from 1984 to 2002 were harvested in the FL panhandle. Given the small proportion of fish measured from the FL west coast, no differentiation was made between landings from these two areas. Figure 4 shows relative size frequency distributions for inshore (<10miles) and offshore (>10miles) FL landings from 1997 to 2002. In general, in FL larger fish were sampled from offshore than inshore landings. Figure 5 shows the same information for AL. From 1997 to 1999, AL landings from offshore fishing areas have a higher proportion of larger fish than landings from inshore areas. The small sample sizes of inshore landings from 2000 to 2002 made it difficult to compare inshore and offshore landings. In the case of LA and MS, sample sizes from inshore fishing areas were too small to allow any comparisons with offshore areas (Table 5).

Size frequency distribution of red snappers from AL, LA, and MS offshore fishing areas and Florida inshore and offshore areas combined were compared between from 1997 to 2002 (Fig. 6). Low samples sizes from LA made the comparisons difficult. In general, samples from MS and LA showed a higher proportion of larger fish than samples from AL and FL. Although size distributions from AL and FL were similar, FL samples tend to have smaller fish than AL samples. It is difficult to discern if this is the result of differences between the 2 fisheries or of including FL samples from less than 3 miles (inshore).

Table 5: Number of red snappers sampled by MRFSS from charter (Chrt) and private (Prvt) boats by state and area of fishing.

	Florida				Mississippi				Alabama				Louisiana				
	Inshore (<10)		Offshore (>10)		Inshore (<3)		Offshore (>3)		Inshore (<3)		Offshore (>3)		Inshore (<3)		Offshore (>3)		
	Chrt	Prvt	Chrt	Prvt	Chrt	Prvt	Chrt	Prvt	Chrt	Prvt	Chrt	Prvt	Chrt	Prvt	Chrt	Prvt	TOTAL
1984	10	6	28					1		2	3	12	64	12	150	40	328
1985	1		2	9				1			36	2		4	40	16	111
1986	23	7	37	2			16	1		1	105	6	10	11	344	40	603
1987	45	34	174	83			10	3	21	20	221	39	20		210	22	902
1988	11	4	53	20	9	5	28	12	39		207	1			6	68	463
1989	3	7	14	4	14		13				125	5			20	64	269
1990	11	7	6	2		1	14	6	2	11	134	31			83	23	331
1991	45		6	1	1	14	41	46	19	9	627	137	2	2	279	3	1,232
1992	78	8	142	6	11		230	195		18	1,290	304	19	13	293	52	2,659
1993	75	10	182	14		5	98	53		8	314	147		3	125	58	1,092
1994	29		87	17			33	41	6	2	307	129	20	6	98	62	837
1995	31	15	27				5	22	15		182	82	14	1	131	57	582
1996	23	1	38	13		1	36	33			133	61			108	48	495
1997	254	6	416	1		2	11	89	70		459	83		4	89	17	1,501
1998	580	14	1,049				13	51	162	4	1,126	70	25	2	161	16	3,273
1999	1,431	59	2,255	64	8		57	49	68	19	3,558	560		2	37	115	8,282
2000	1,320	38	3,442	45	15		51	5	26		2,882	354		1	86	13	8,278
2001	938	62	2,647	43			80	5		24	2,786	363			10	8	6,966
2002	1,227	23	3,177	55	18		136	19		1	2,729	544	2		235		8,166

Table 6 shows the number of red snapper from offshore fishing areas sampled by MRFSS by season for the periods 1997-1999 and 2000-2002. Figure 7 presents the relative size frequency distributions by state, season and period. In general, landings from season 4 have smaller fish than landings from seasons 1-3.

Table 6: Number of red snapper from offshore fishing areas sampled by MRFSS in the periods 1997-1999 and 2000-2002. Seasons 1 through 4 correspond to periods Jan-Mar, Apr-Jun, Jul-Sep, and Oct-Dec, respectively.

State	Season	1997-1999	2000-2002
AL	1	2,357	
	2	2,112	4,380
	3	1,028	4,184
	4	359	1,094
FL	1	684	3
	2	2,073	4,188
	3	719	3,707
	4	309	1,511
LA	1	95	
	2	113	193
	3	207	144
	4	20	15
MS	1	123	
	2	61	147
	3	62	53
	4	24	96

COMPARISONS BETWEEN SURVEYS

Relative size frequency distributions were compared between Headboat (areas 25-27) and TXPW size data (Fig. 8) and between Headboat (areas 23-24) and MRFSS (AL, LA, MS, and FL west of Franklin county) (Fig. 9).

The comparison between TXPW and Headboat size data (1986-2002) did not show a clear and consistent pattern. But, in general Headboat size data presented higher proportion of red snapper around the legal minimum size and TXPW data a higher proportion of undersized fish (Fig. 8). In contrast, differences in relative size frequency between MRFSS and Headboat size data (1997-2002) showed a clear and consistent pattern with landings from Headboats having higher proportion of larger fish than MRFSS intercepts.

CONCLUSIONS

- Headboat size data covers mostly the northern and western Gulf (FL panhandle to TX) and it indicates that larger fish are landed on the northern Gulf compared to the western areas.

- The larger proportion of TXPW size data consist of samples from private boats and from offshore fishing areas (> 10 miles). In general, landings from offshore areas have larger fish than landings from inshore areas.

- Most MRFSS samples are from the states of Alabama and the Florida panhandle and the data shows an important increase in sampling effort after 1998.

- The MRFSS size data also shows that landings from offshore areas have larger fish than landings from inshore areas.

- The TXPW size data shows a higher proportion of undersized fish while the Headboat data a higher proportion of fish around the minimum legal size.

- The Headboat data clearly show landings with a higher proportion of larger fish when compared to MRFSS data.

-This data suggests that in calculating the recreational catch-at-size, the following stratification scheme might be considered:

1) Headboat: areas 17-24 and 25-27.
2) TXPW: no geographic strata.
3) MRFSS: no geographic strata.

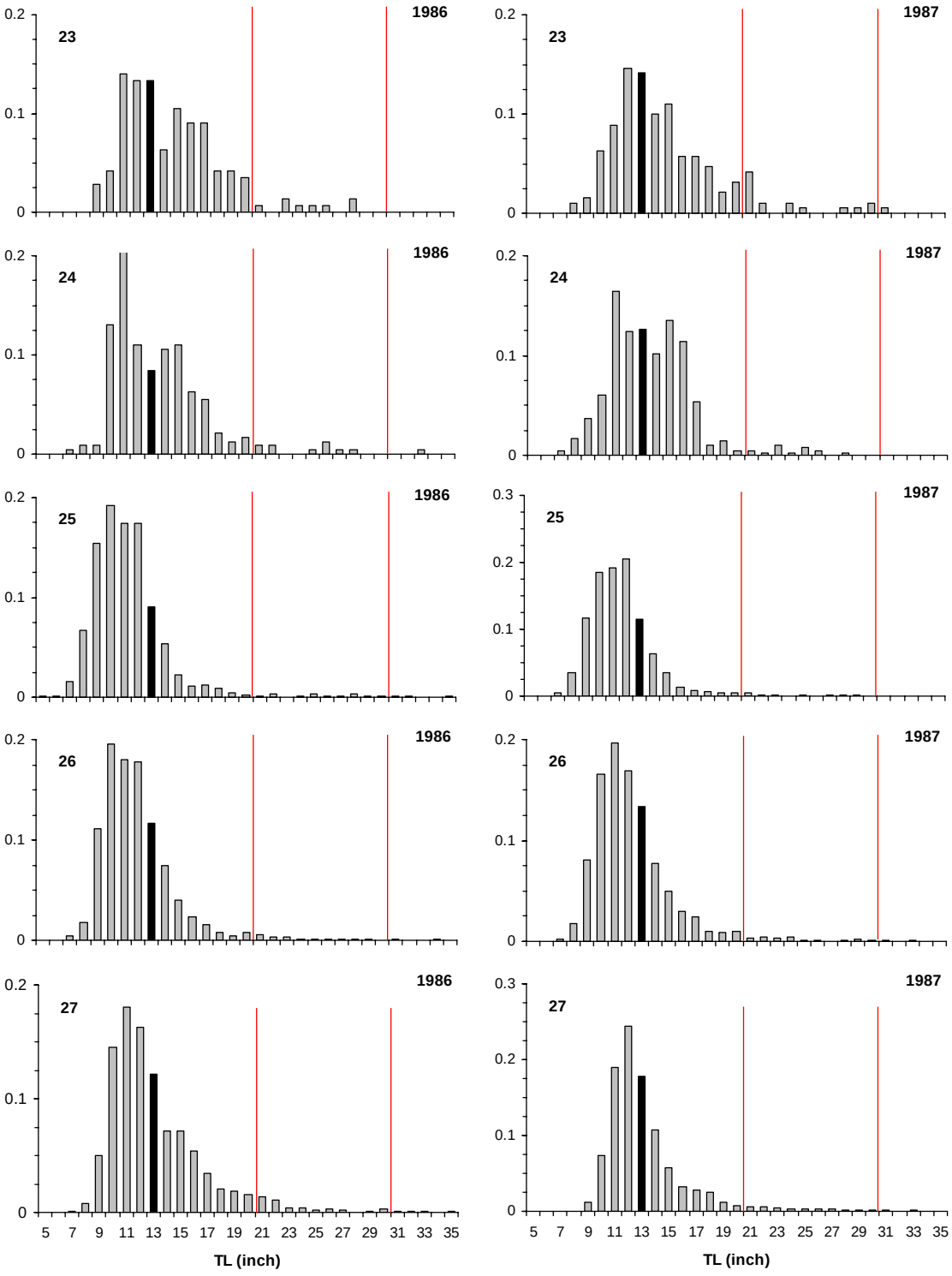
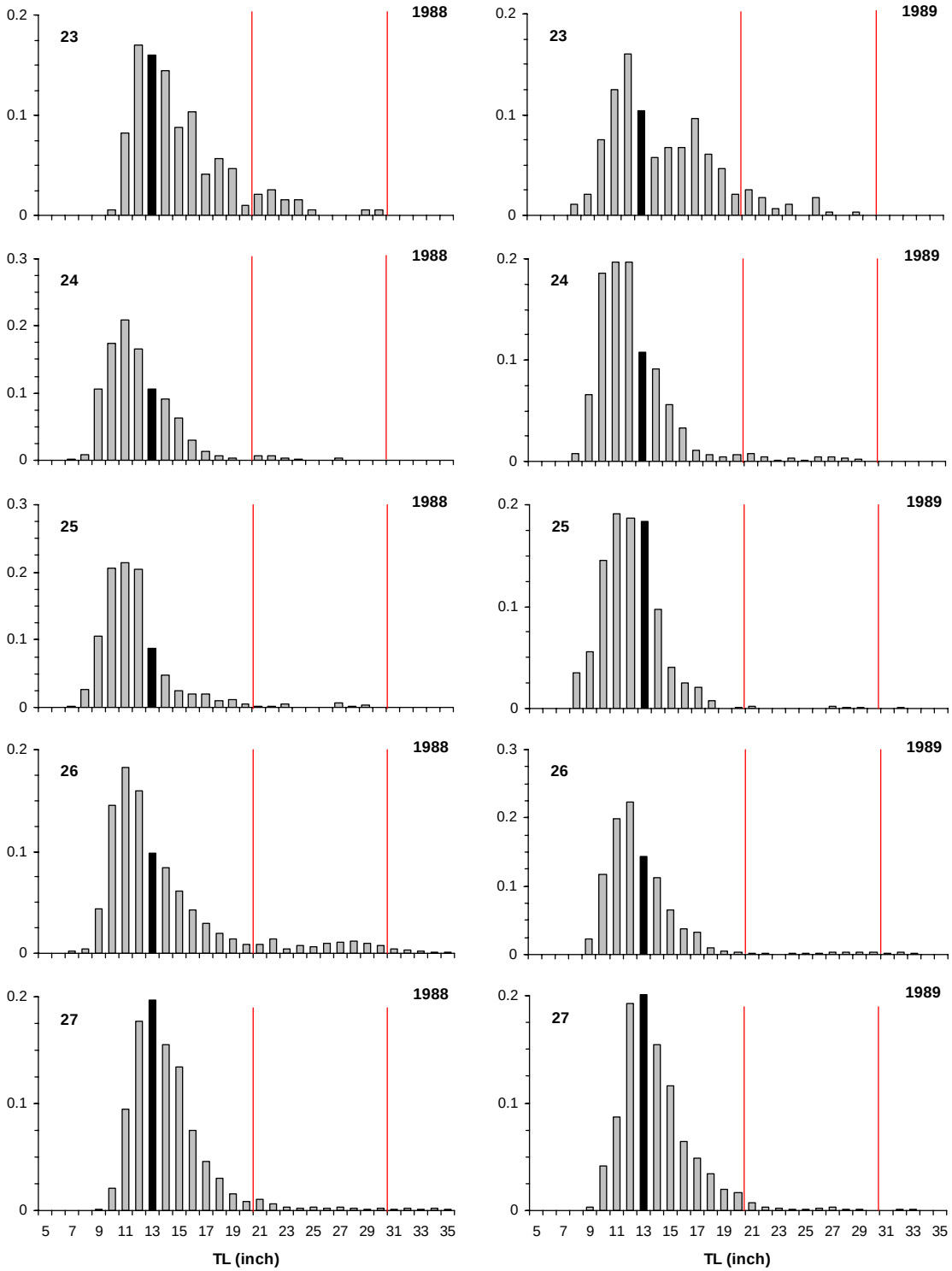


Figure 1: Relative size frequency distribution of red snapper sampled by the Headboat survey in areas 23-27 from 1986 to 2002. Black vertical bar indicates minimum legal size.

Figure 1 (continued)



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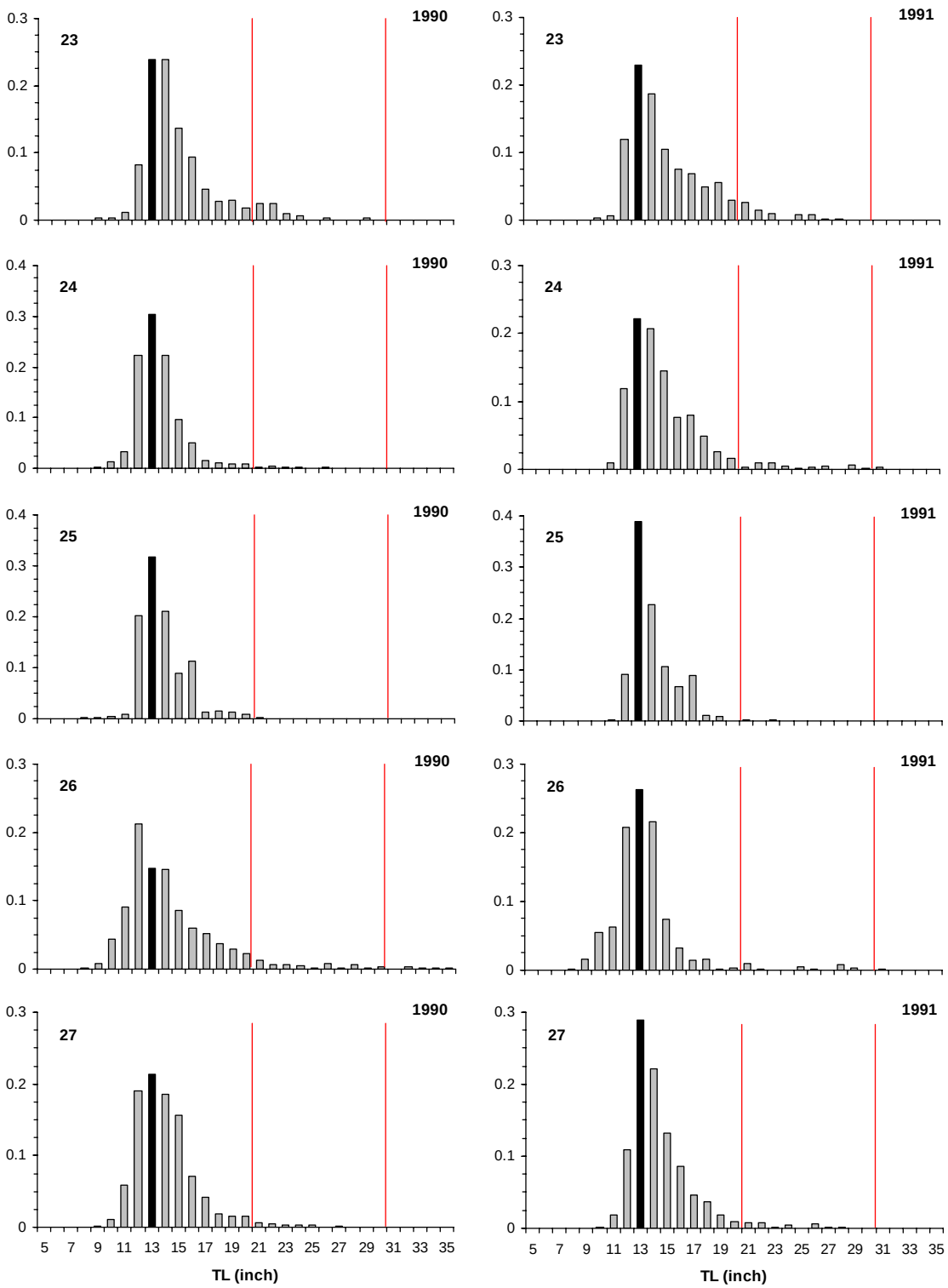

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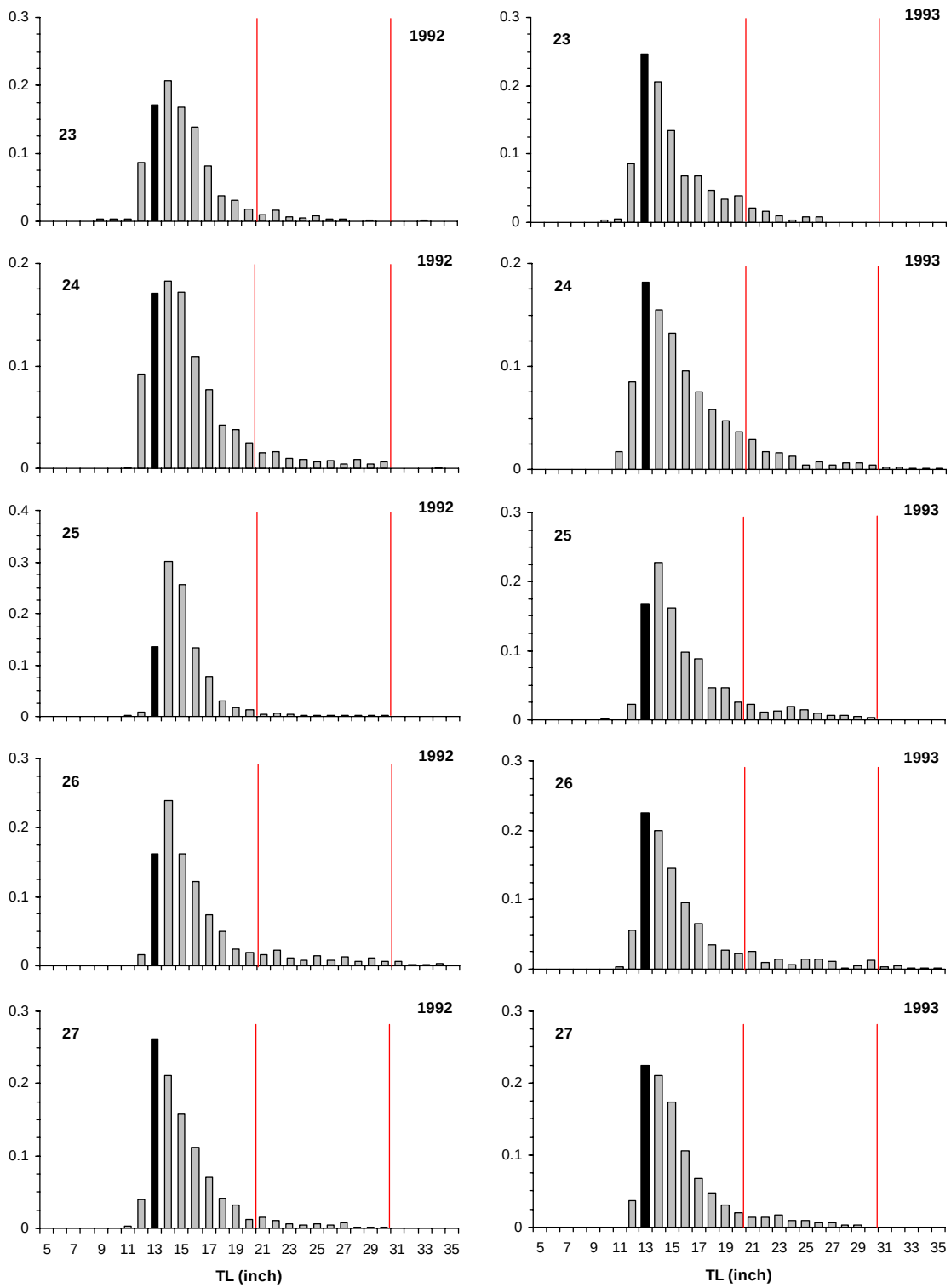

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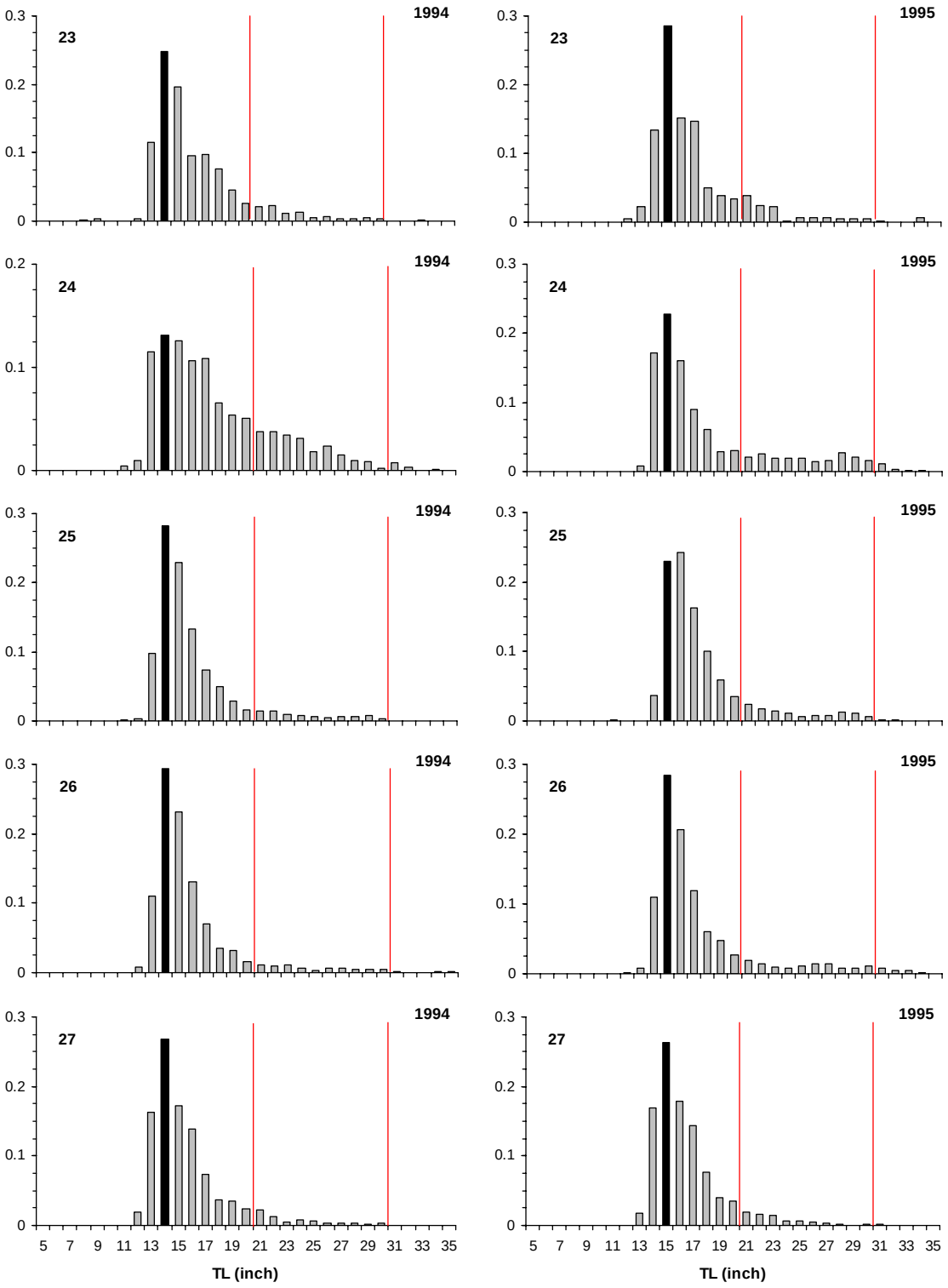

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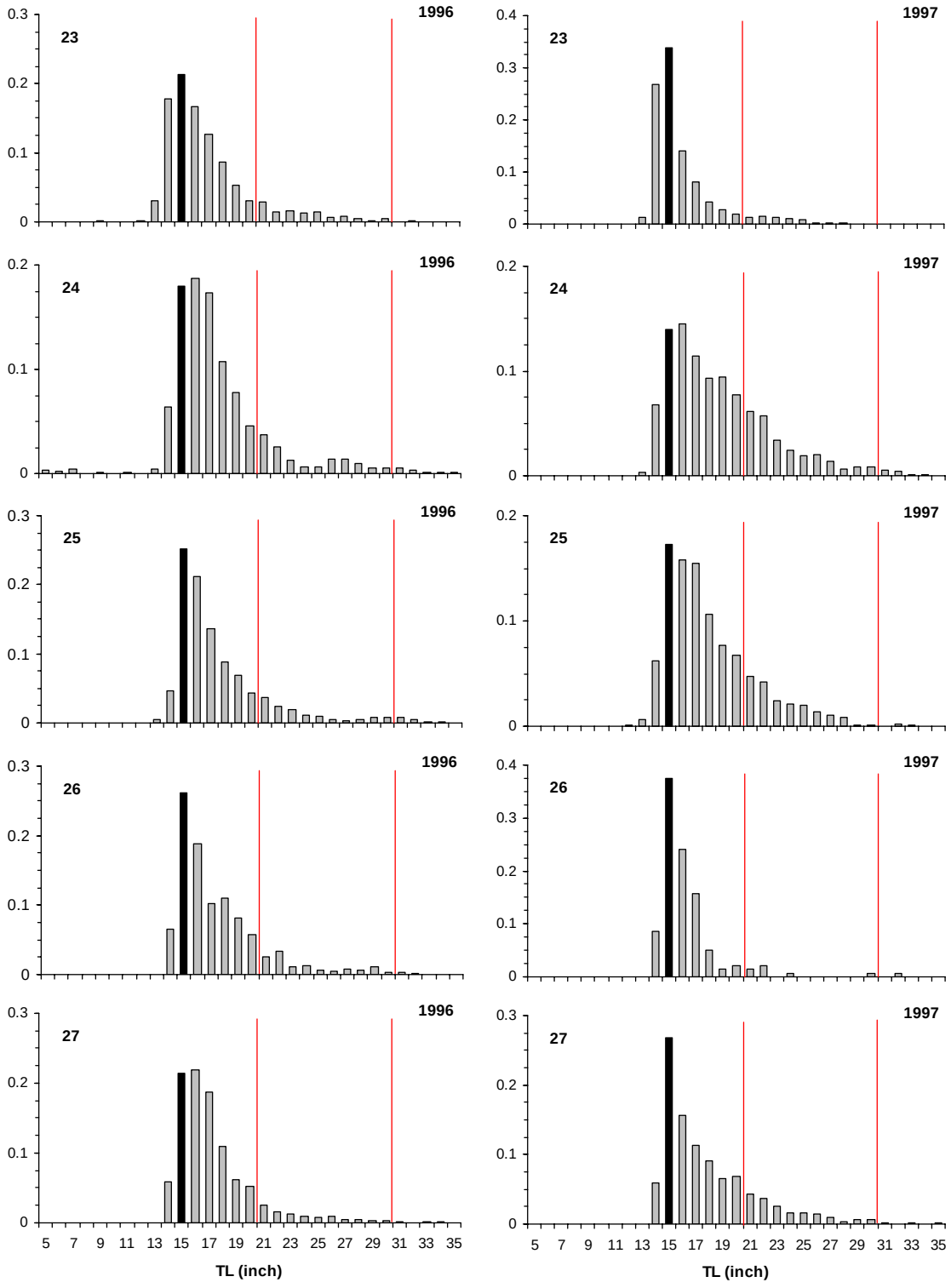

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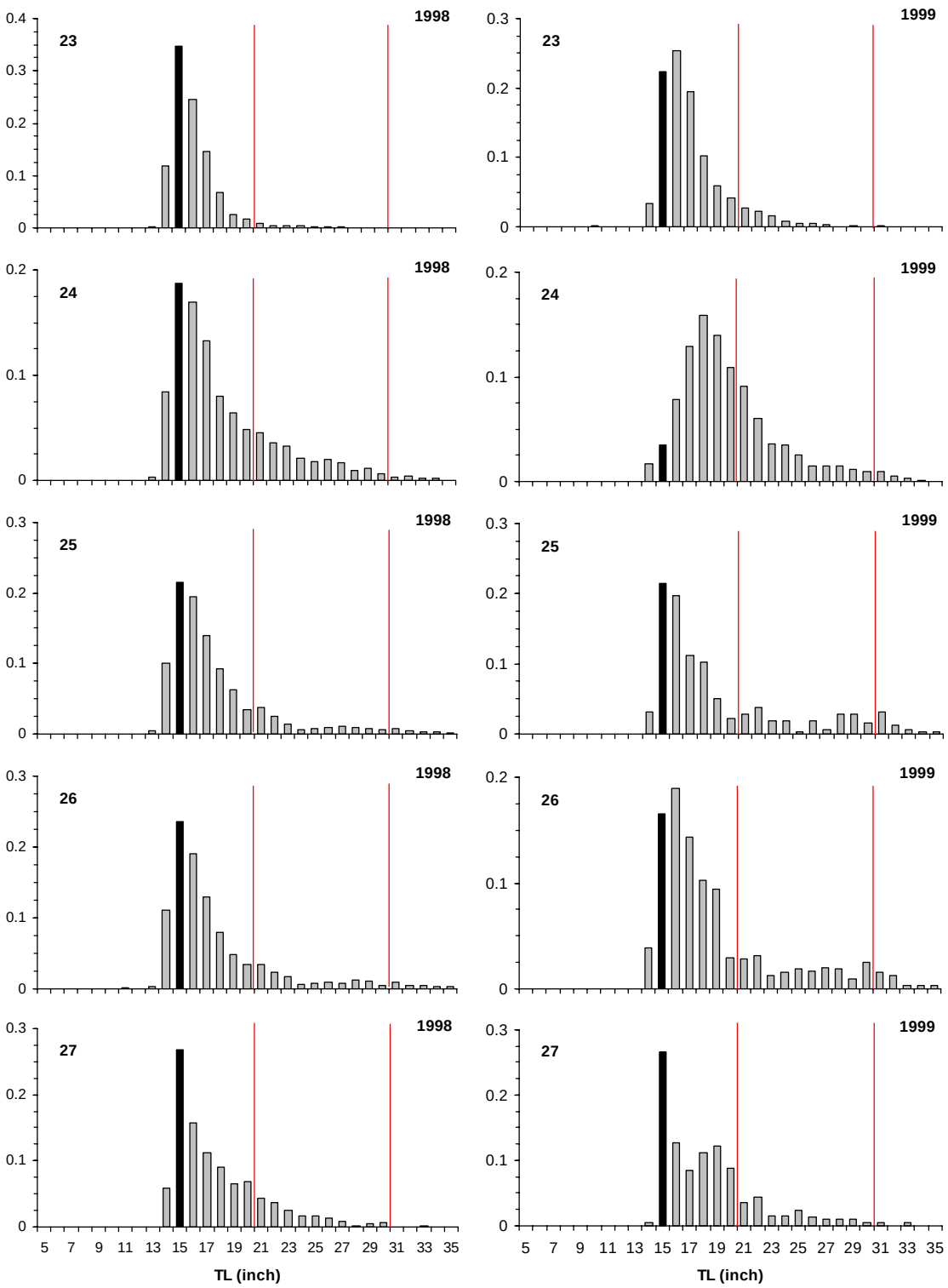

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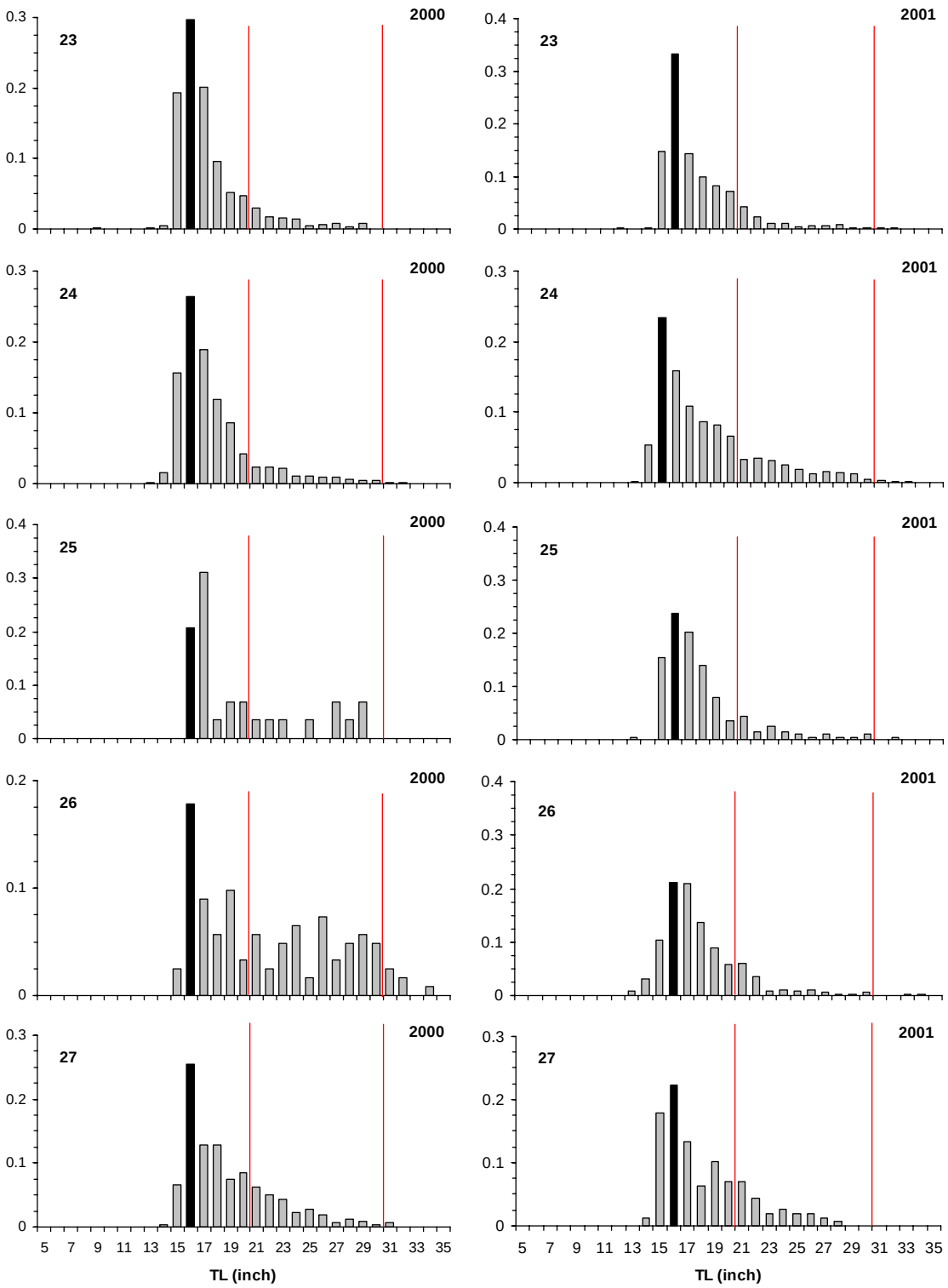

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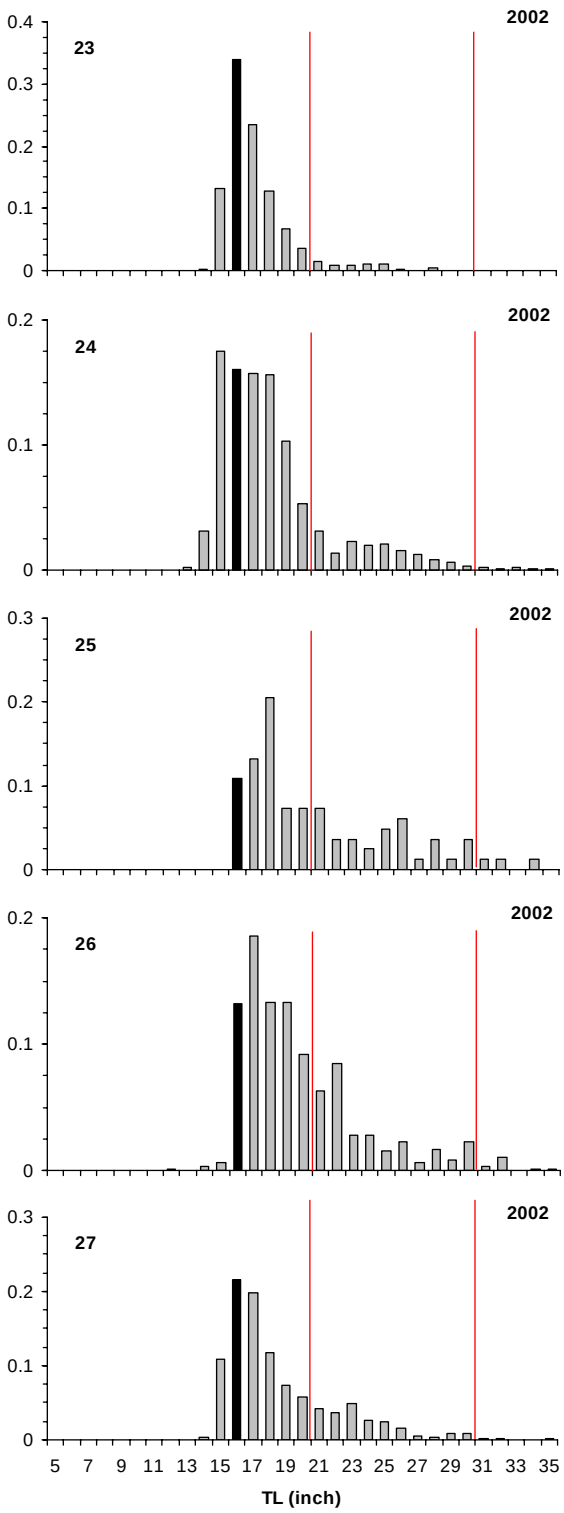


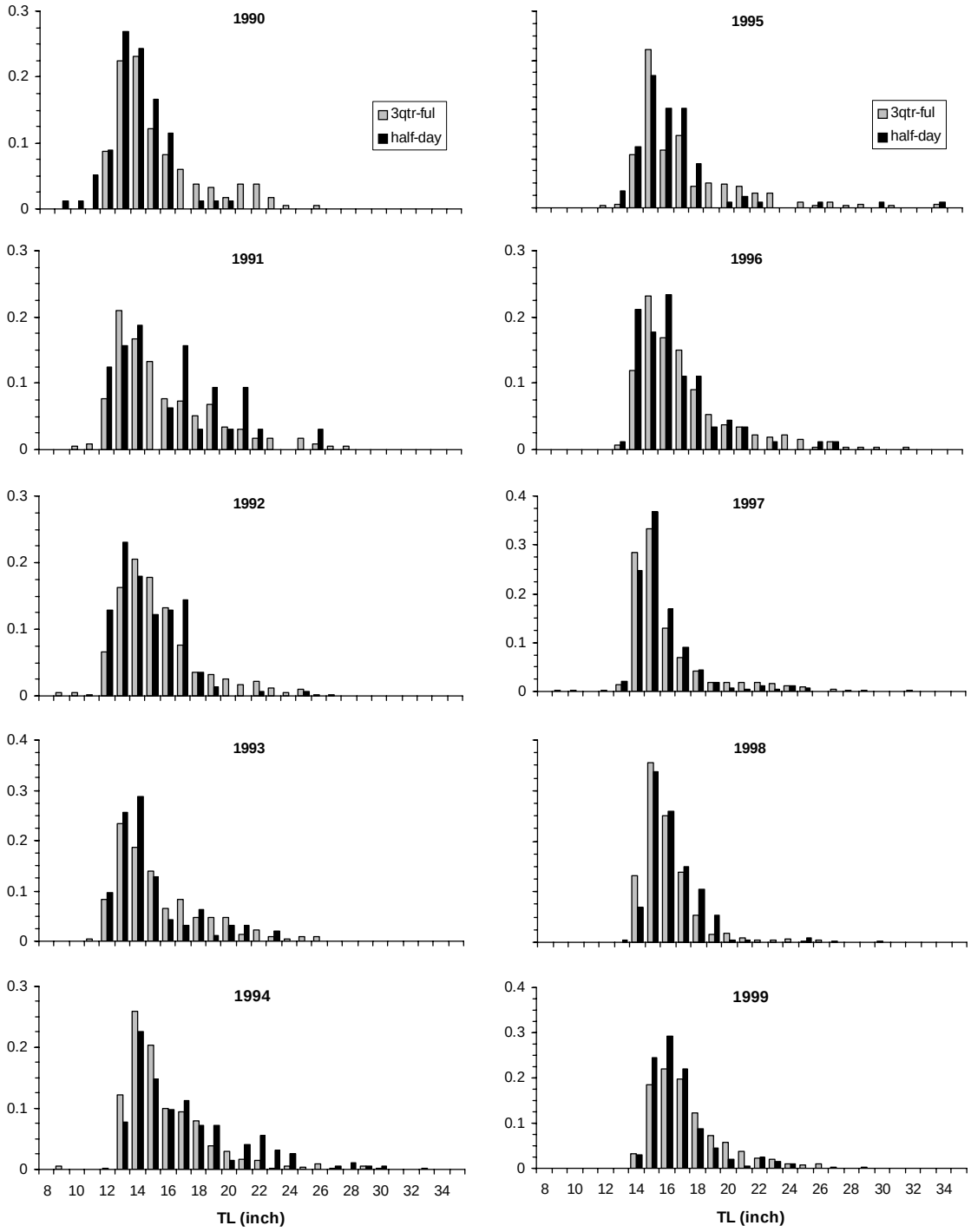
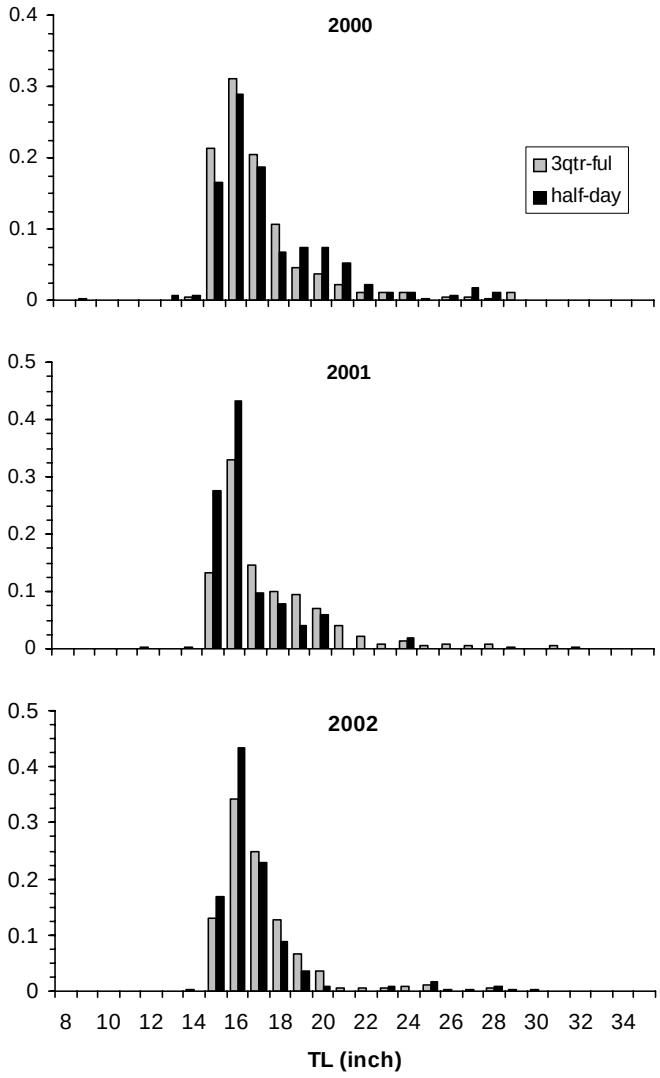


Figure 2: Relative size frequency distributions of red snapper landed from half-day and full-day headboat trips from area 23.

Figure 2 (continued)



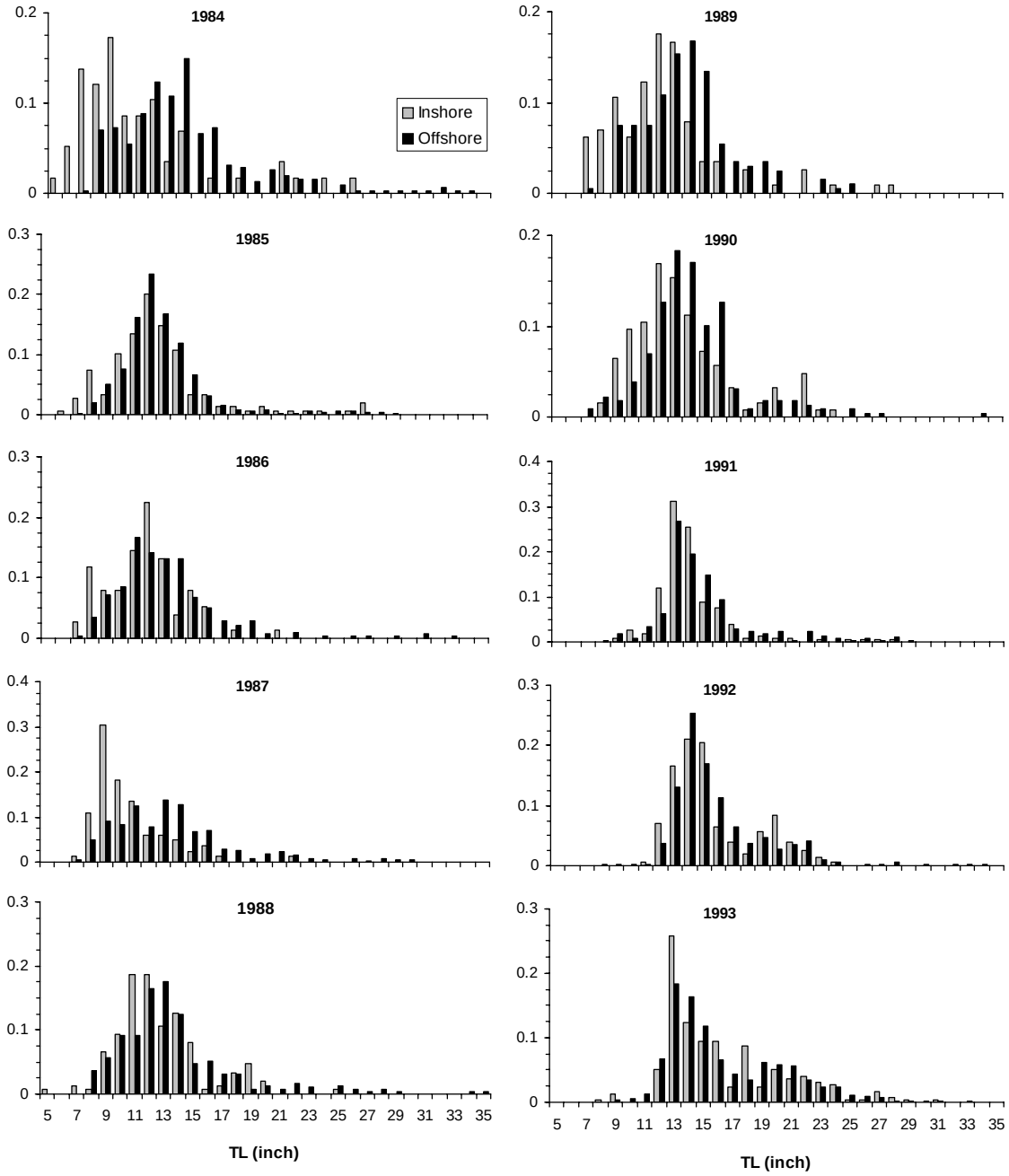


Figure 3: Relative size frequency distribution of red snappers landed from private and charter boats sampled by the Texas Parks and Wildlife survey from 1984 to 2002.

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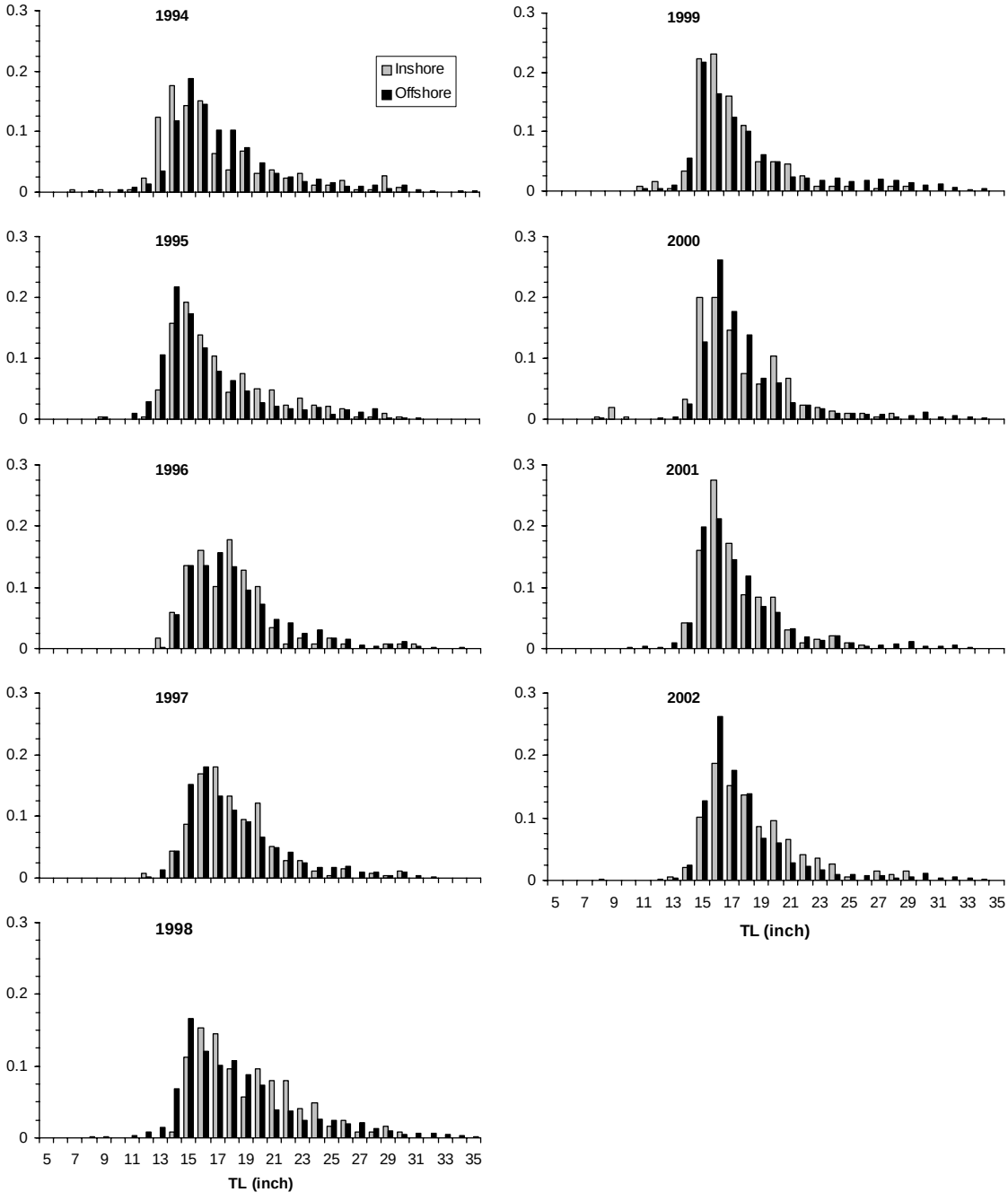

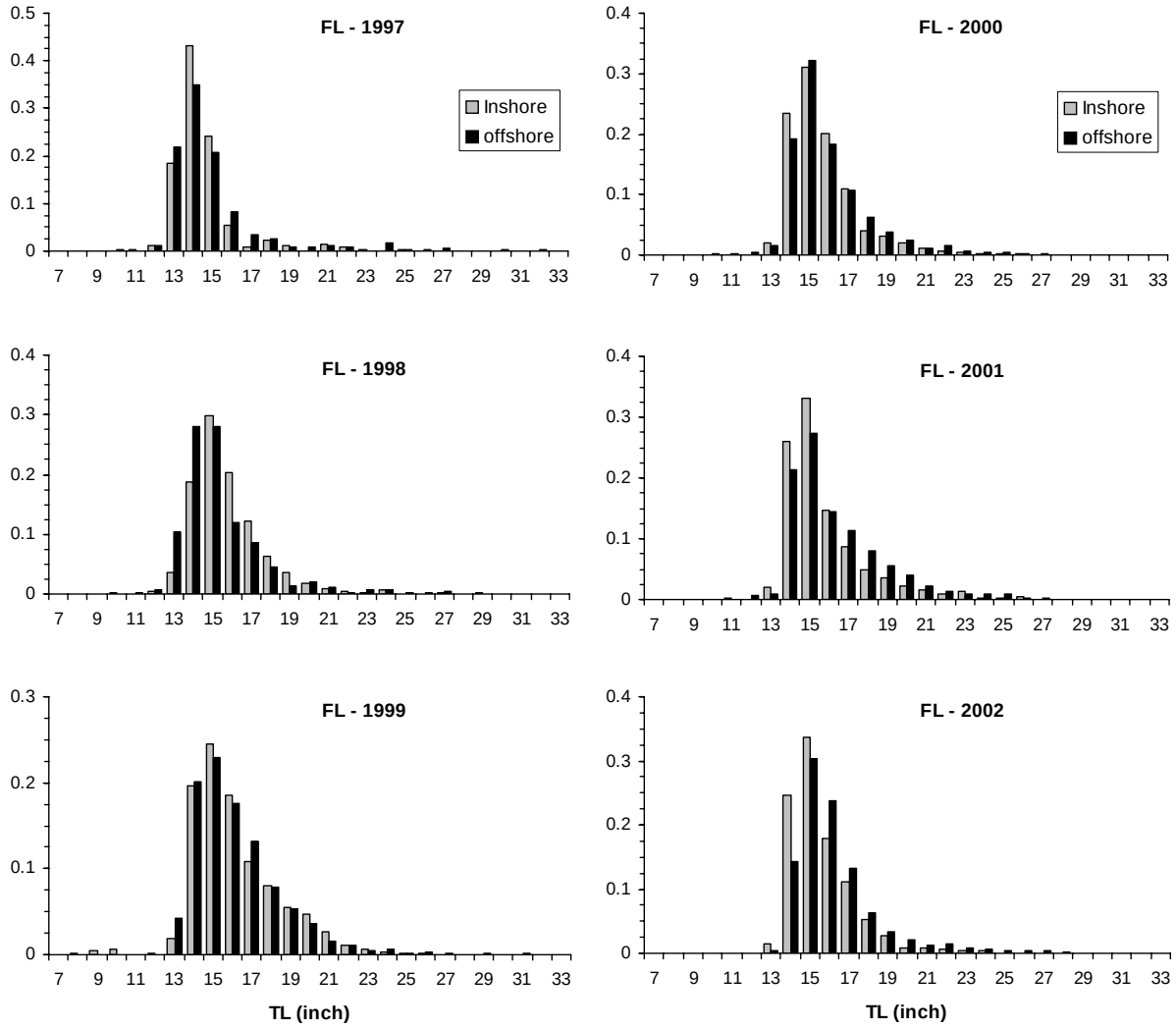

Figure 4: Relative size frequency distribution of red snappers sampled by MRFSS in FL from inshore (<10 miles) and offshore (>10 miles) fishing areas (1997-2002).

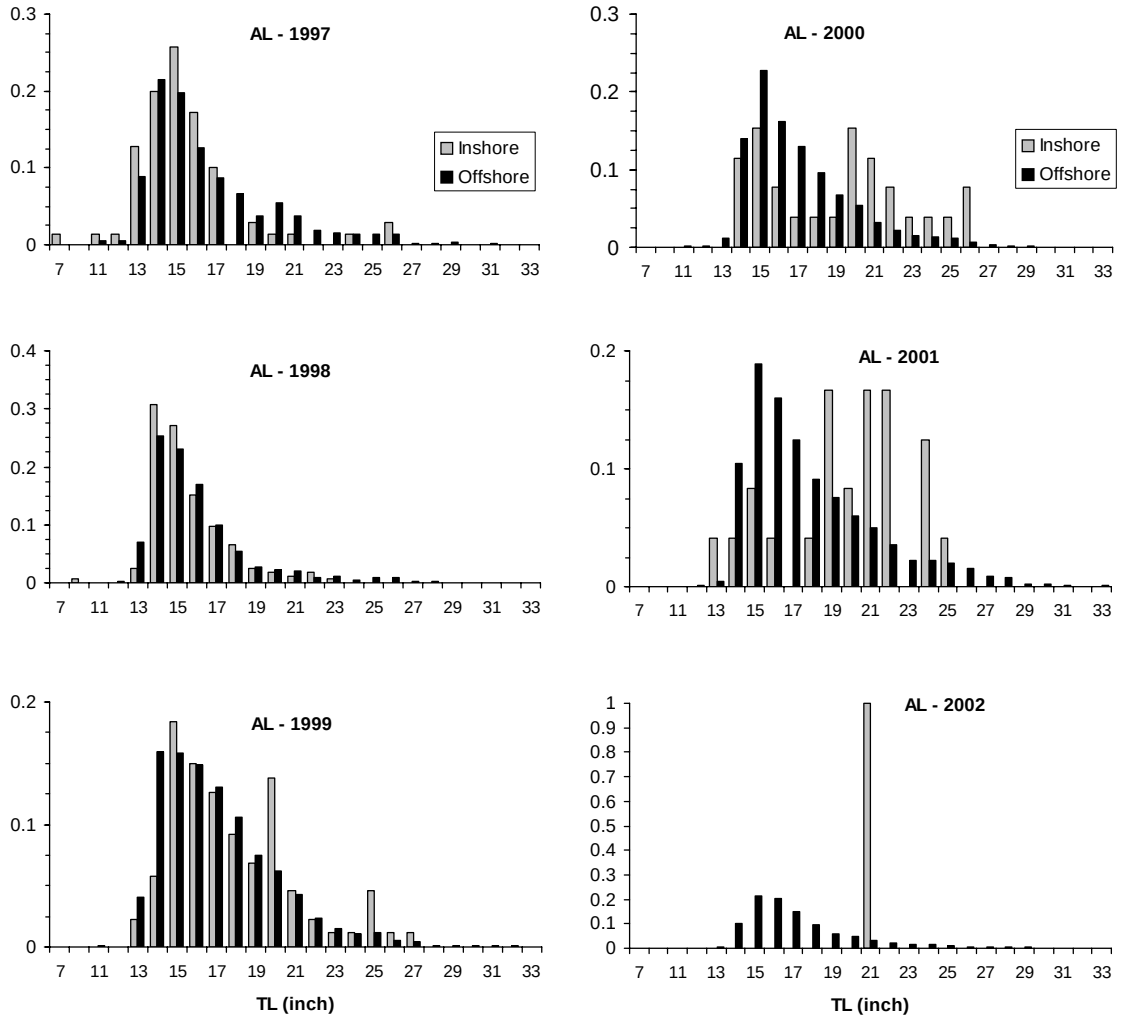

Figure 5: Relative size frequency distribution of red snappers sampled by MRFSS in AL from inshore (<3 miles) and offshore (>3 miles) fishing areas (1997-2002).

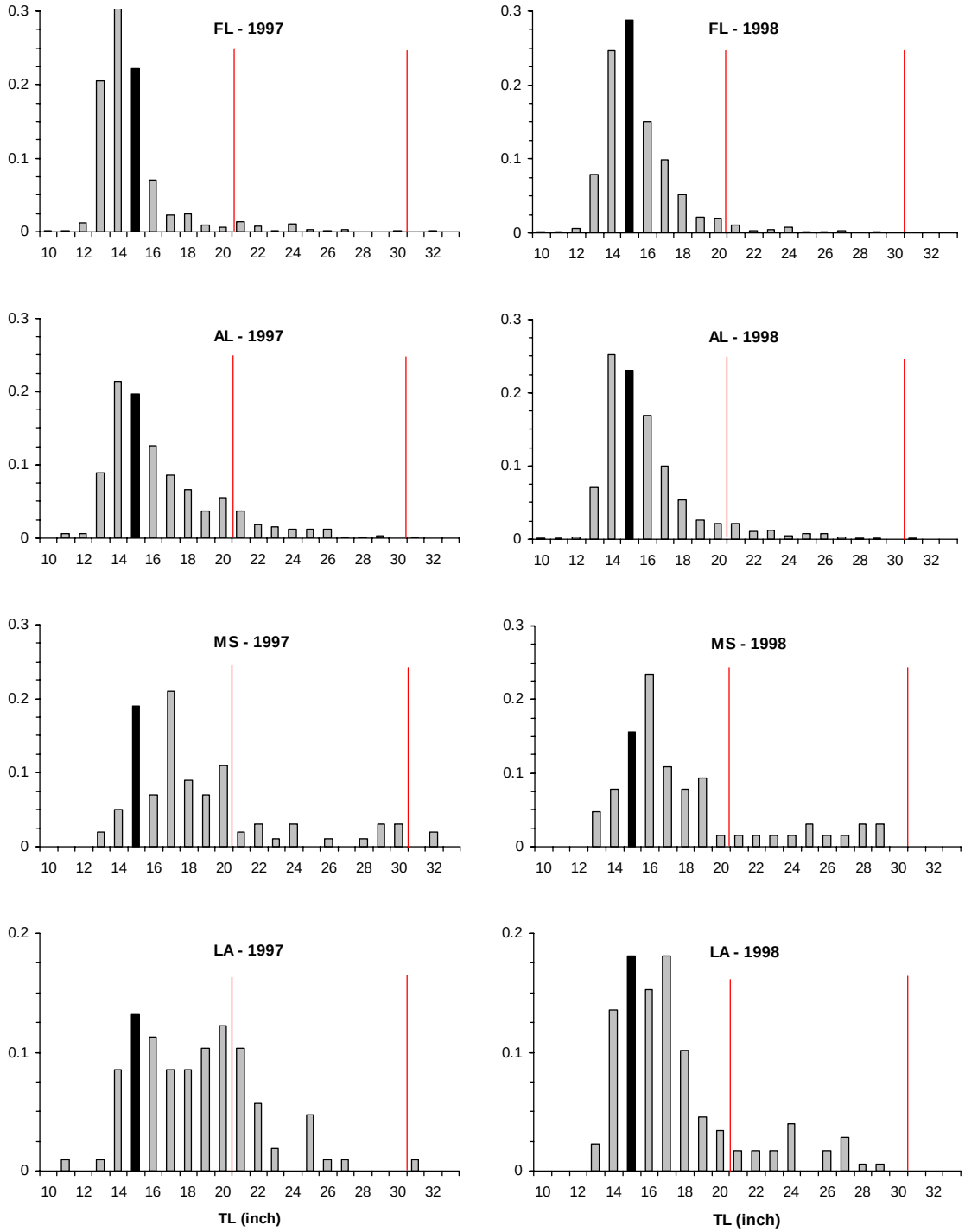

Figure 6: Relative size frequency distribution of red snapper sampled by MRFSS in AL, LA, and MS from offshore fishing areas (> 3 miles) and from FL (inshore+offshore) from 1997 to 2002. Dark vertical bar indicates legal minimum size.

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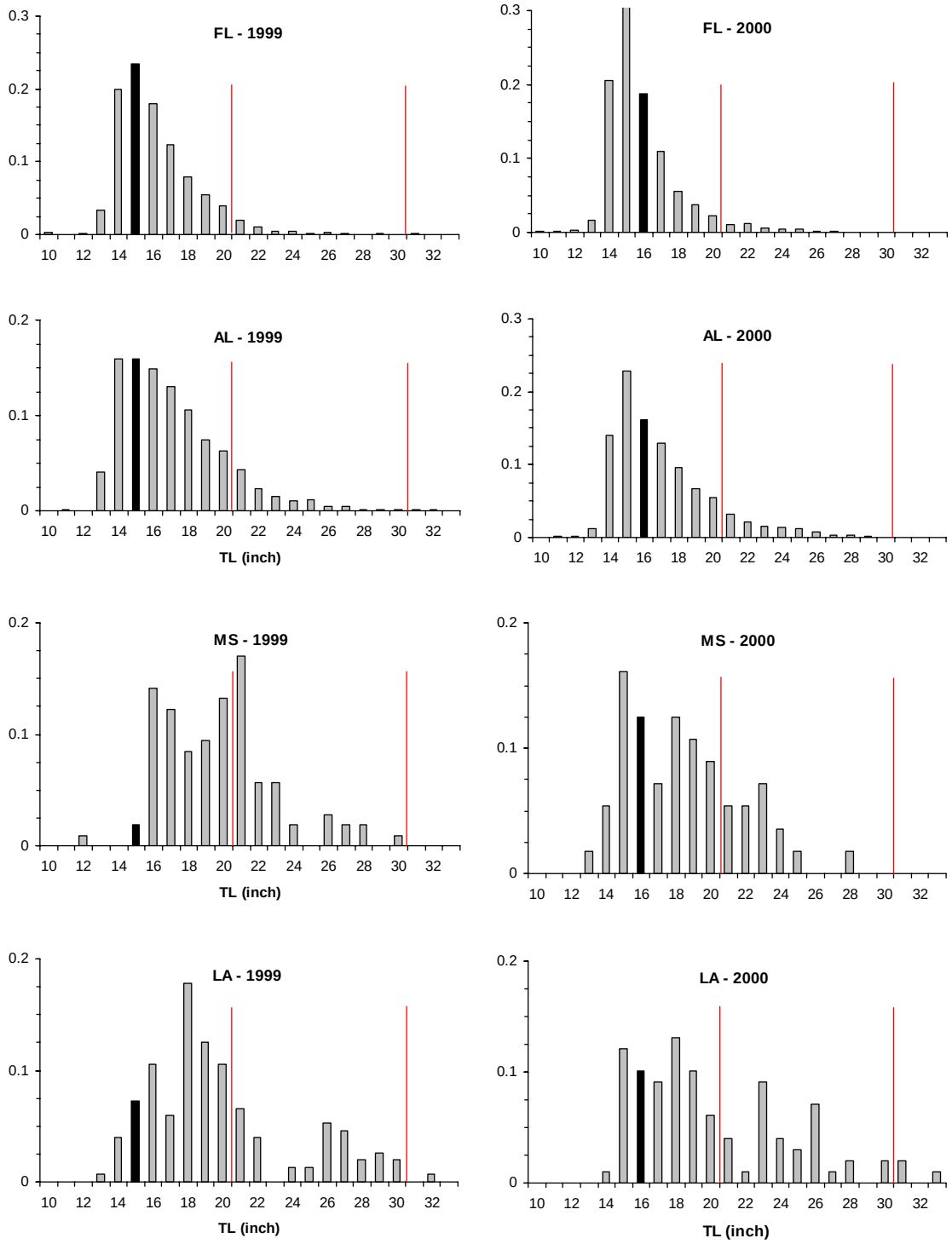

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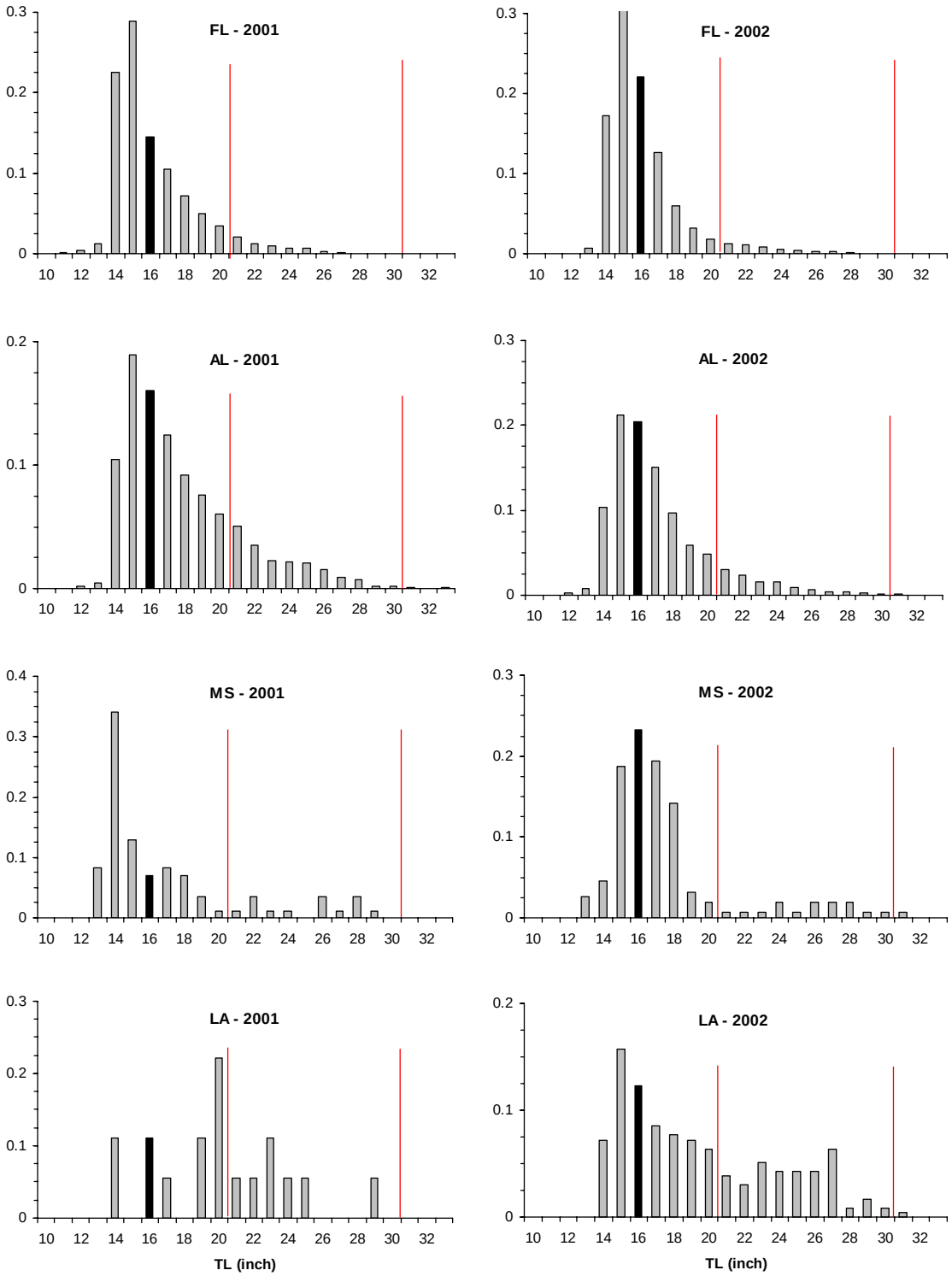

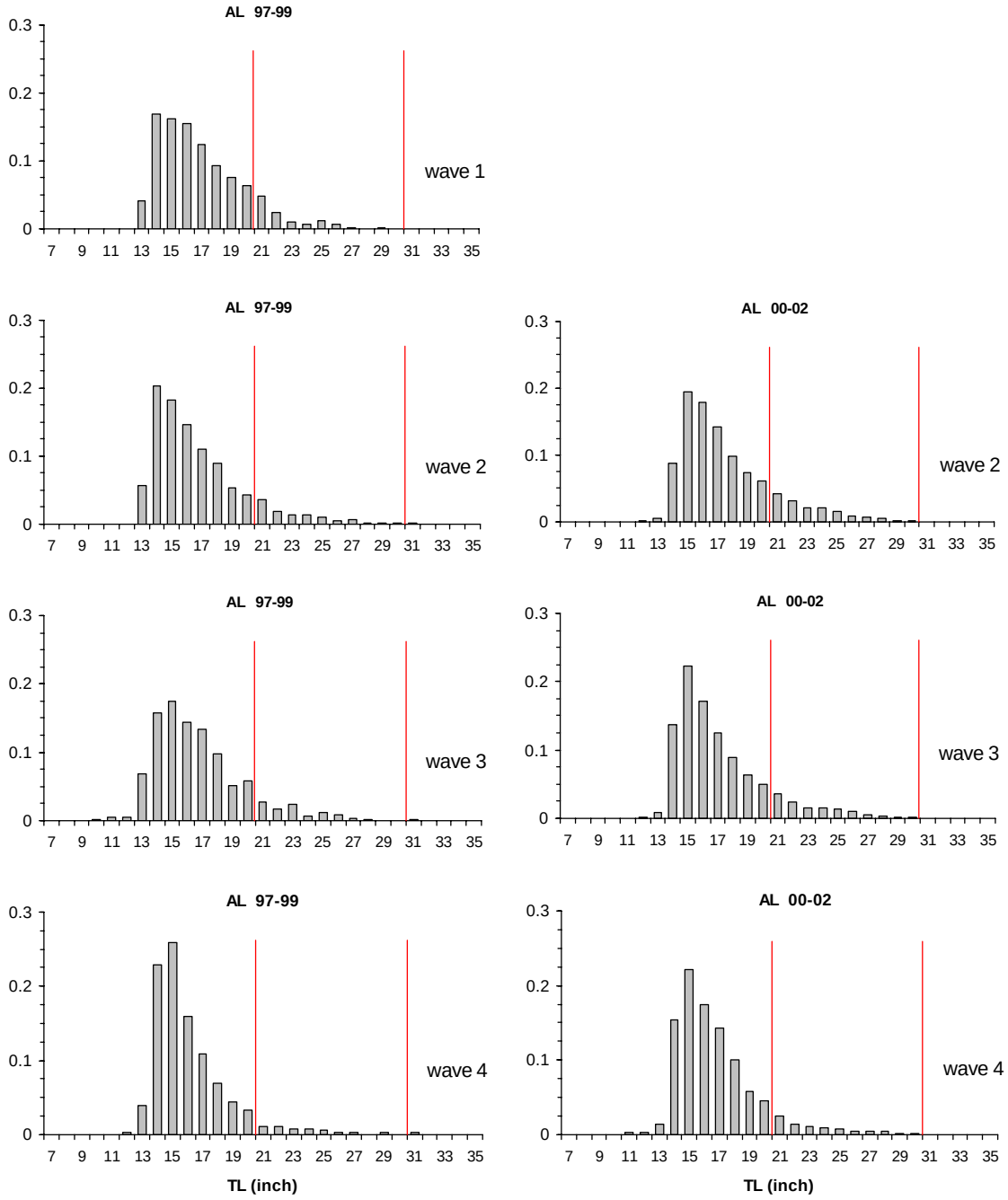

Figure 7: Relative size frequency distributions of red snappers sampled by MRFSS by state, season (wave), and period. Sample sizes are given in Table 6.

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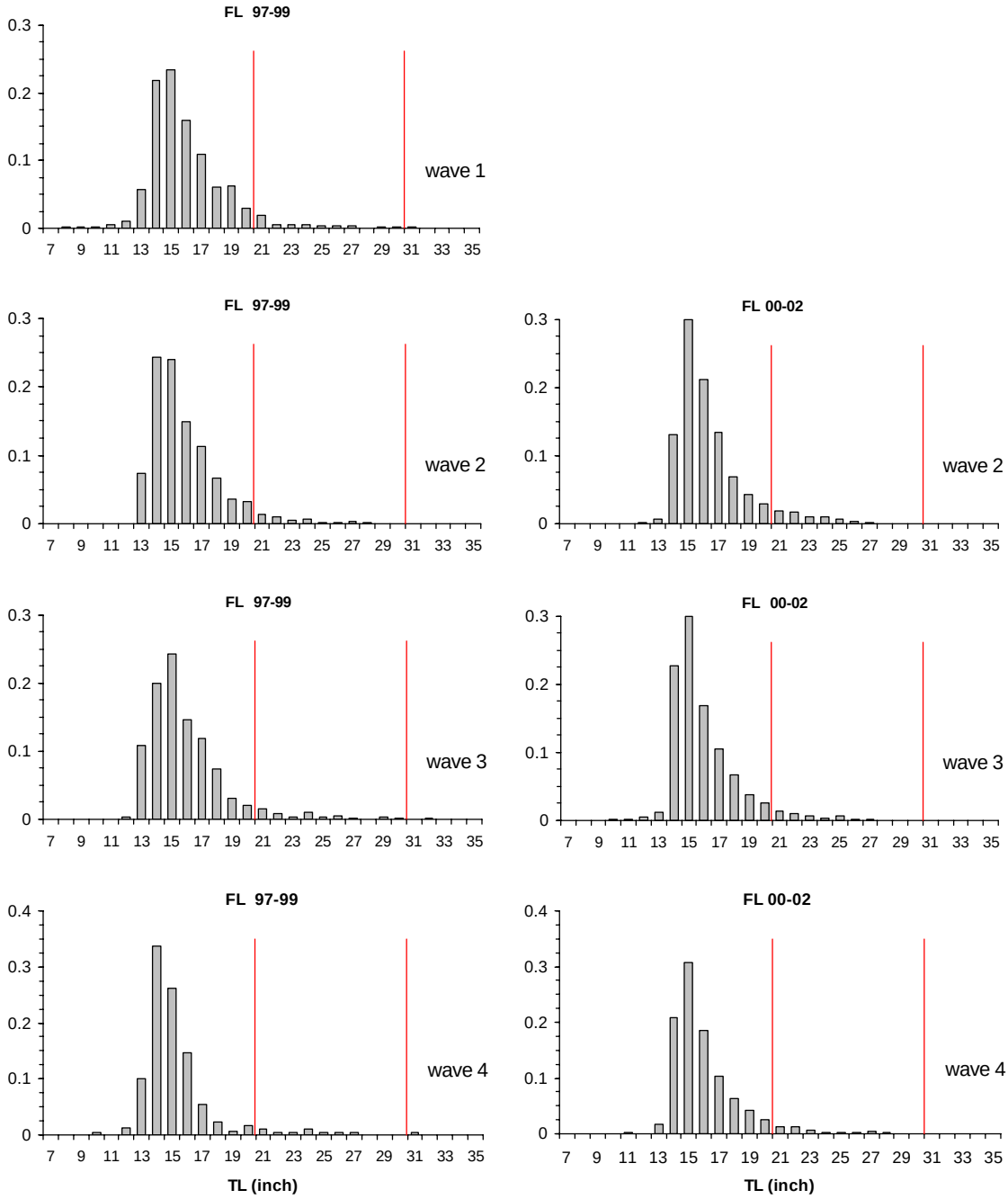

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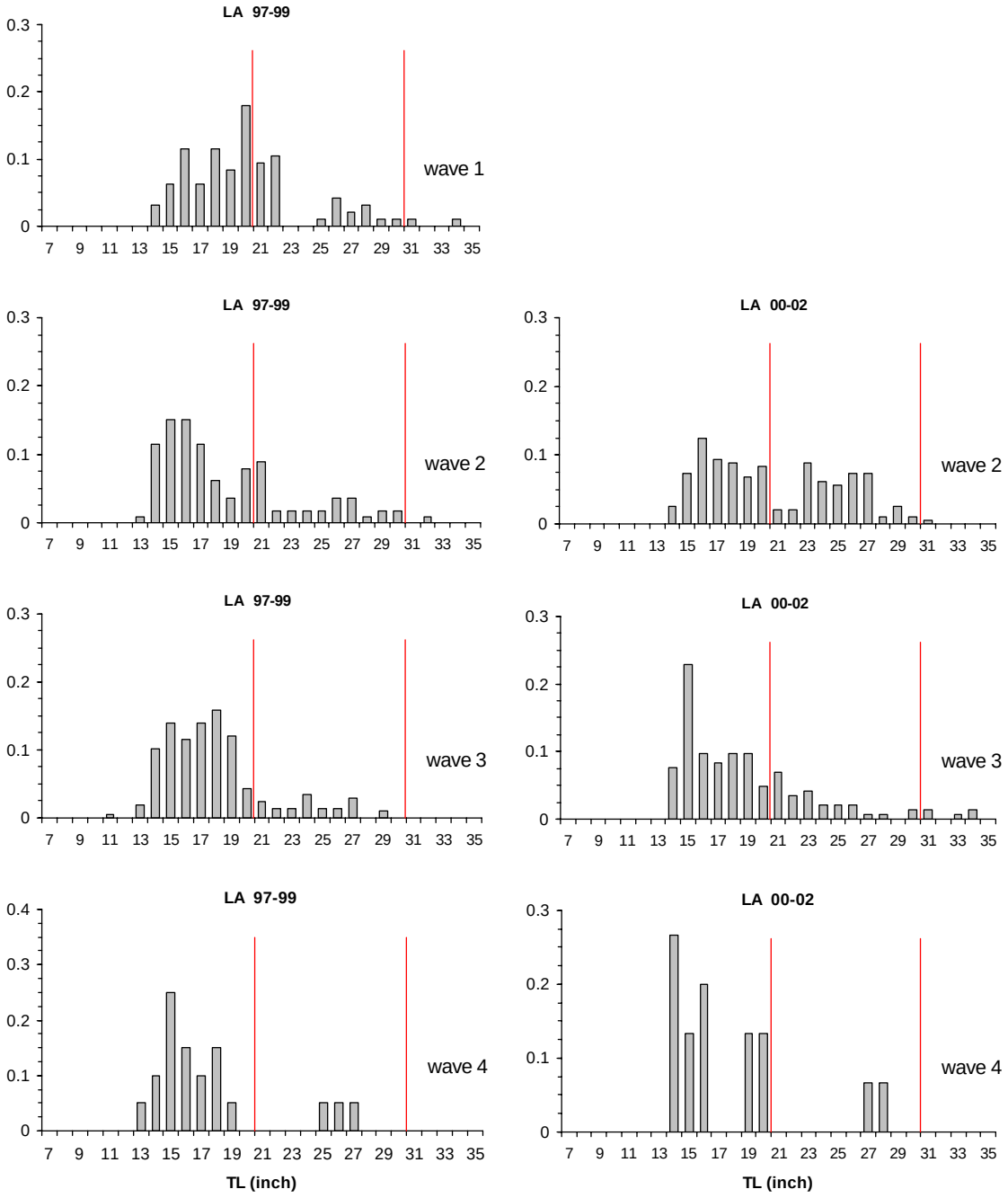

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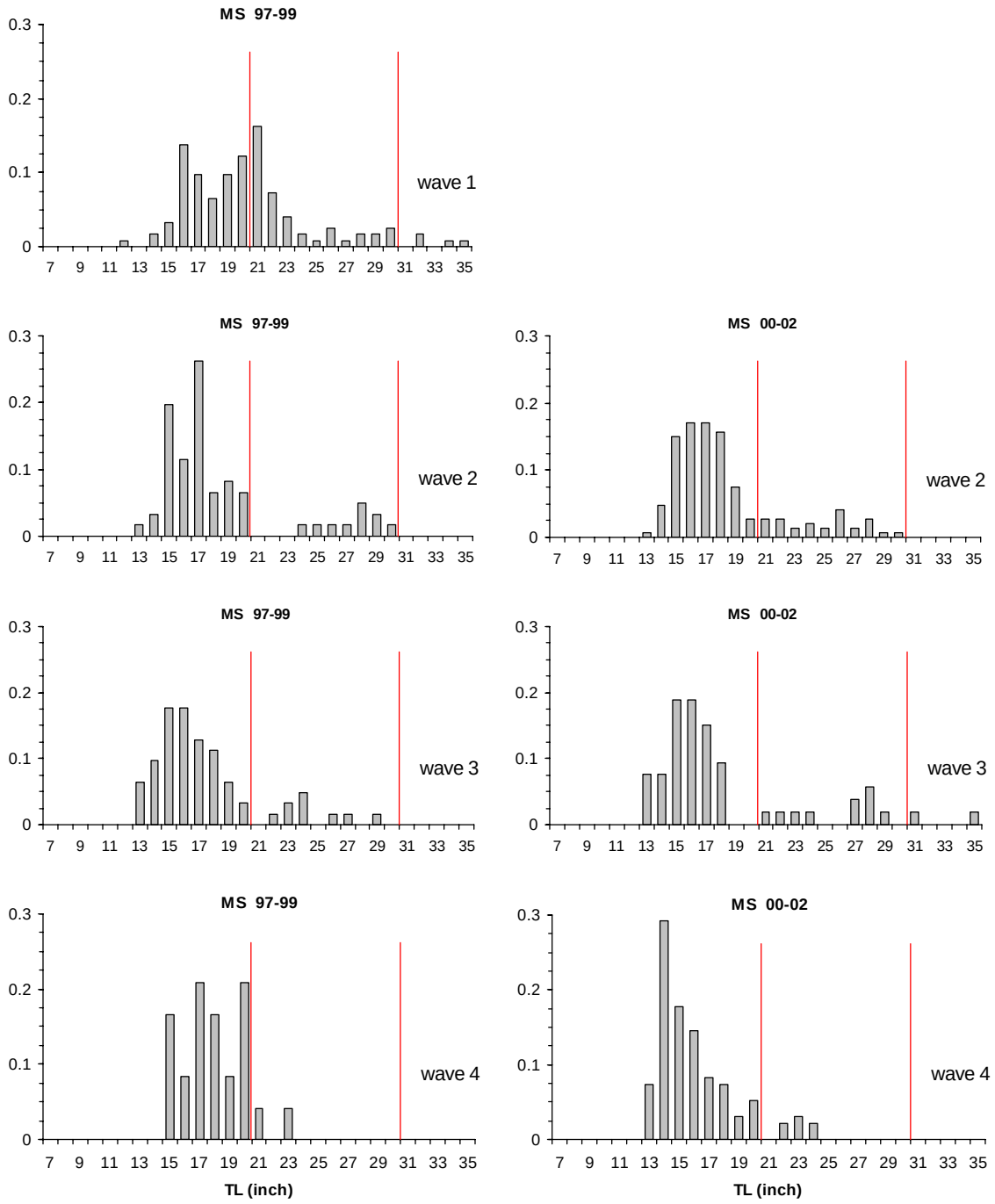

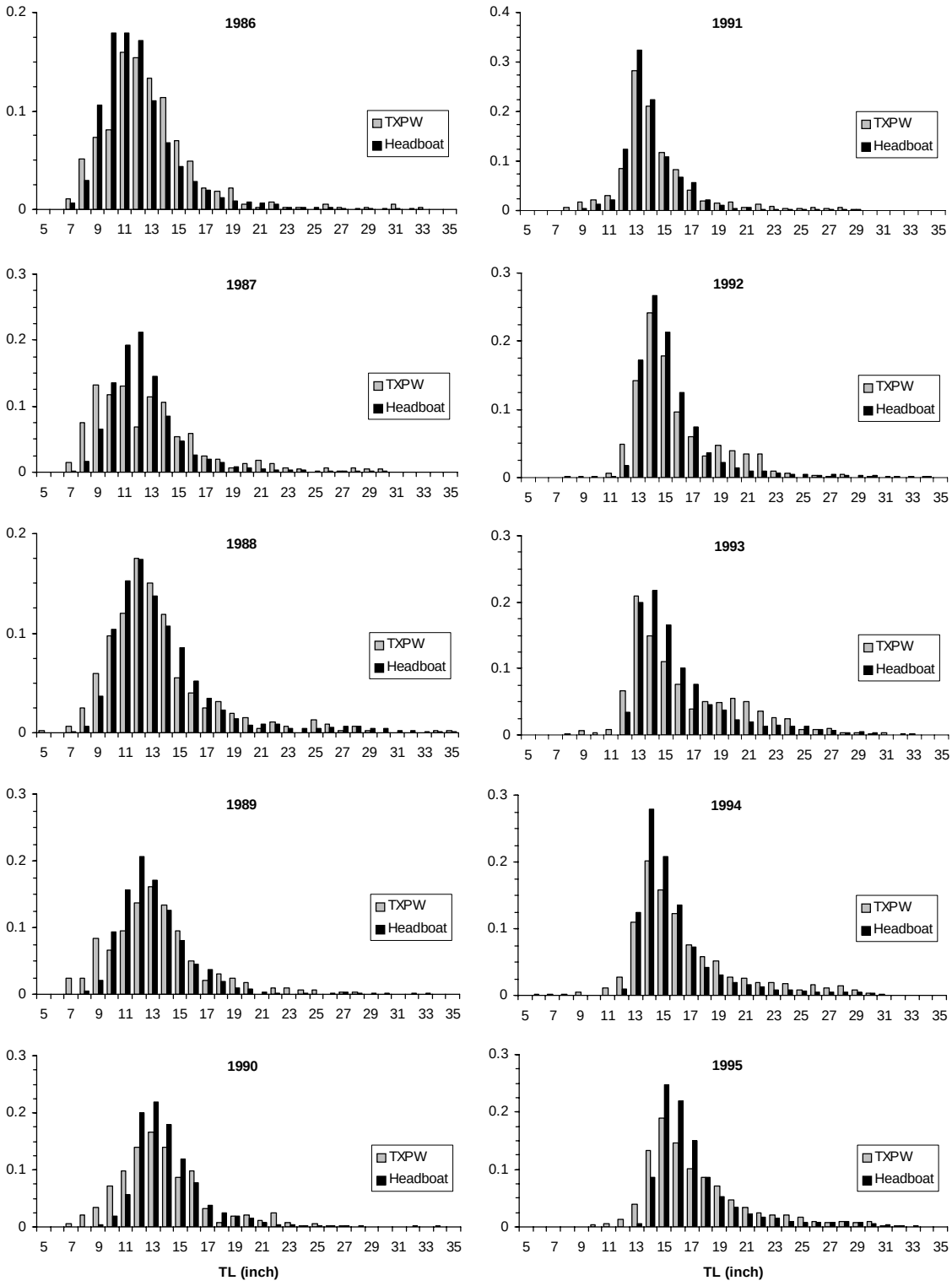

Figure 8:Relative size frequencies distribution of red snappers sampled byTXPW and the Headboat survey from 1986 to 2002.

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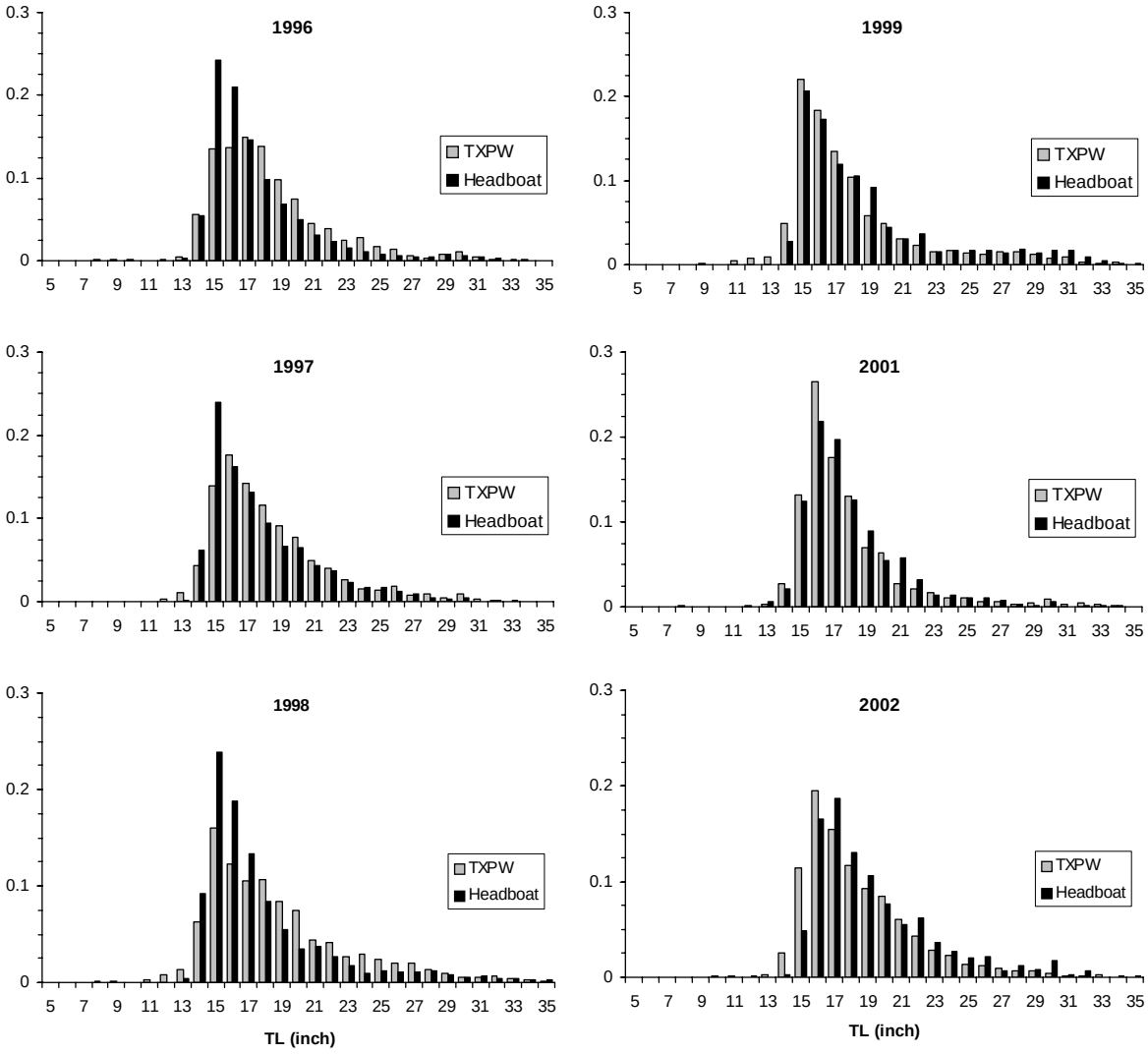

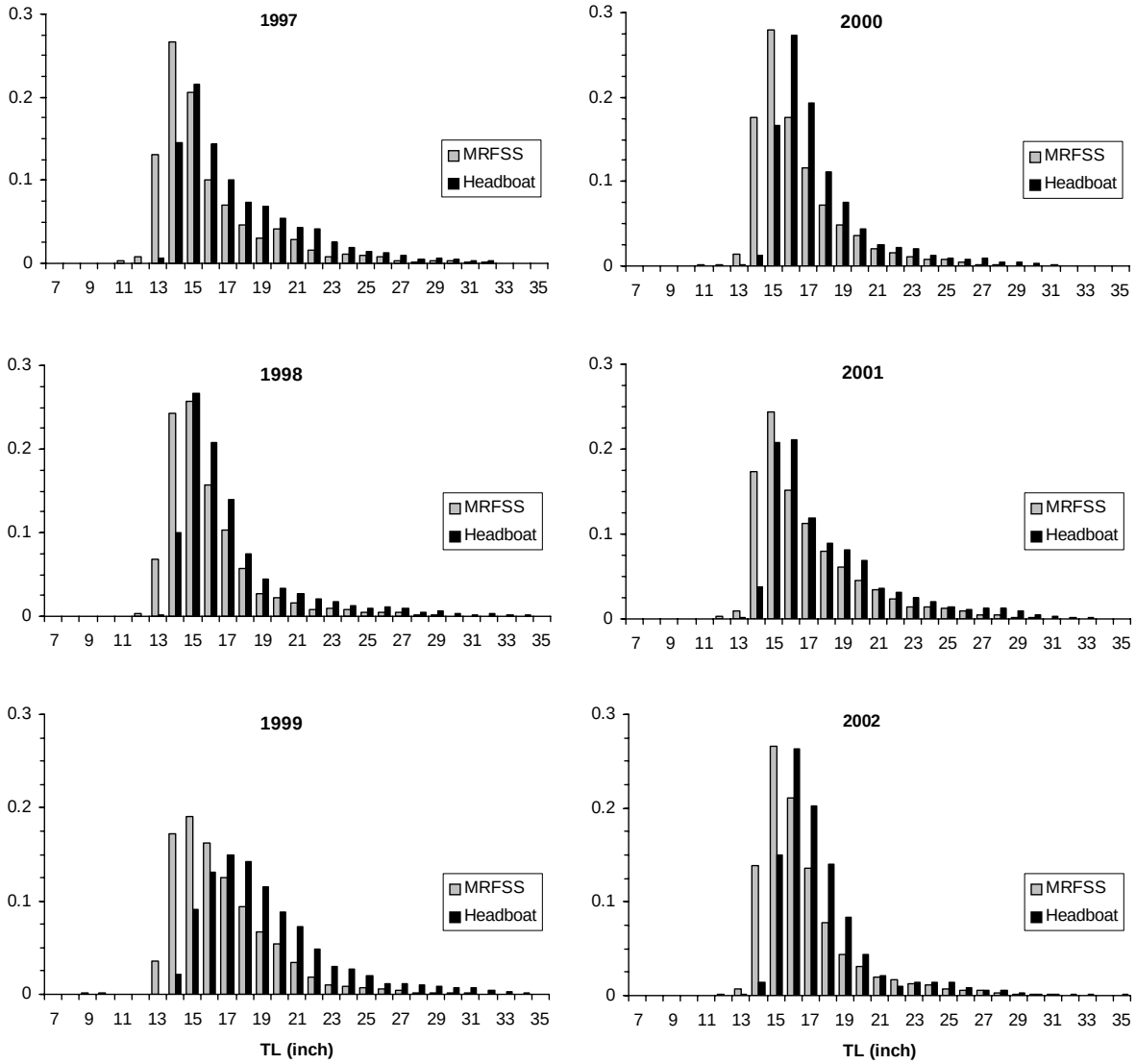

Figure 9: Relative size frequencies distribution of red snappers sampled by MRFSS and the Headboat survey from 1997 to 2002. For the present comparison, MRFSS and Headboat survey histograms only include intercepts from the FL panhandle to LA.