

Effects of King Mackerel Fishing Regulations on the Construction of Fisheries Dependent Indices of Abundance

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Introduction

Regulatory measures implemented for king mackerel in the US Gulf of Mexico and south Atlantic include minimum size limits, periods during which the fishery was closed, and bag/trip limits. Each of those management elements varies spatially and has changed, sometimes frequently, over time. Construction of fisheries dependent indices of abundance may be affected by such regulations if fishing effort is affected. This document describes efforts made to identify and address potential impacts of regulations on king mackerel fishery dependent indices of abundance.

Methods for addressing two of the three types of regulatory measures were recommended by the SEDAR16 king mackerel data workshop. In constructing revised fishery dependent indices, data from the periods when the fishery was closed were to be excluded. In addition, the data workshop recommendation regarding changes in minimum size was to depend upon the population model to address changes in minimum size. This is a feature of the model proposed for use (Stock Synthesis 3). No further exploration of those two types of regulatory measures was attempted.

The third regulatory element, bag/trip limits, may affect fishery dependent indices of abundance if vessels reach the bag/trip limit and then target other species on the same trip. In such cases fishing effort cannot be accurately apportioned among the targeted species with the existing fisheries dependent data sets. This document describes efforts made to identify and address potential impacts of trip limits on king mackerel fishery dependent indices of abundance.

Methods

The initial step in examining regulatory effects on index construction was to assemble detailed regulatory histories for both the king mackerel recreational and commercial fisheries. The required level of detail contained within those histories included the ability to assign to each trip, regardless of location and date of the trip, all applicable regulatory measures.

Recreational Indices

Examination of bag limit regulations for each recreational data set, headboat and MRFSS, involved calculating a “bag limit ratio” for each trip within each management unit (Atlantic and Gulf of Mexico):

$$\text{Bag limit ratio} = \frac{\text{reported total landings of all anglers on a vessel}}{\text{vessel total bag limit}}$$

A bag limit ratio of one indicated a trip that reached the total bag limit for the vessel. Ratios greater than one indicated trips that exceeded the bag limit and ratios less than one indicated trips that did not reach the bag limit. For the headboat analysis, the bag limit of a vessel was adjusted to include individual bag limits for the captain and

crew during periods when such an increase was allowed under regulations. The MRFSS data analysis included only landed fish (AB1), not discards (B2).

Commercial Indices

Potential effects of trip limits on the commercial index construction (coastal logbook and trip ticket) were examined by first categorizing positive trips (trips reporting king mackerel landings) by the percentage of king mackerel to total landings. Four categories were defined: <25%, 25-50%, 50-75%, and >75% king mackerel in the trip landings. This served as an approximation of king mackerel targeting. In addition, multiple regions, differing by the timing and level of trip limits, were defined (Figure 1). Trip limit effects were examined for each region – trip limit combination.

For each area - trip limit combination, scatter plots of trip specific landings were plotted by year to provide an overview of the range of landings among trips. In addition, frequency histograms of trips by pounds landed were constructed to determine the frequency of trips that reported reaching or exceeding the trip limit. Separate plots were constructed for each area - trip limit – targeting combination.

Results and Discussion

Regulatory History

The king mackerel recreational regulatory history is provided in Table 1. The commercial regulatory history is provided in Table 2 (minimum size changes), Table 3 (fishery closures), and Table 4 (trip limit effective dates). Both regulatory histories are complex over time and space.

Bag/Trip Limits

Bag limit ratios determined from headboat data are shown in Figure 2 (Atlantic management group) and Figure 3 (Gulf management group). Only an occasional, rare trip reported reaching or exceeding the bag limit. This is in agreement with the unanimous view of fishermen in attendance at the data workshop. These results indicate that king mackerel bag limits likely have little or no effect on headboat king mackerel fishing effort.

Results of the MRFSS bag limit ratio analysis differed from the headboat results (Figure 4, Atlantic; Figure 5, Gulf). The MRFSS data indicate that a large number of trips have reported landings reaching or exceeding the bag limit for the trip. This result was disputed by commercial fishermen at the data workshop. Their observations have been that few charter boats exceed the bag limits. That argument would not apply to private vessels, however.

The distributions of trip specific landings reported to the coastal logbook program and on trip tickets were similar for like area – trip limit combinations. Three examples will be discussed, however all plots are contained in the Appendix to this document. The only trip limit implemented in the South Atlantic was a 3,500 pound limit. The distribution of trips across reported landings (coastal logbook) is shown in Figure 6 (trip ticket data is plotted in Figure 7). Vessels rarely if ever reach or exceed the trip limit and, therefore, this particular trip limit likely does not affect fishing effort or index construction. This result is in agreement with observations of commercial fishermen at the data workshop.

If trips reporting primarily king mackerel landings on a trip (>75%) reach or exceed the trip limit, a meaningful index may still be constructed provided hours fished was reported. If effort is measured only by day or days, as is sometimes the case in the trip ticket data, then index construction will be difficult. For trips that report less than 75% king mackerel in the landings and also reach the trip limit, appropriately determining king mackerel effort is problematic with the available commercial data. Total hours fished is reported to the coastal logbook program (hours fished or days at sea are reported on trip tickets) and cannot be divided among the species landed. If, however, trips with landings containing less than 75% king mackerel do not reach the trip limit then those trips are presumed to have had a consistent effort across species.

Figures 8 and 9 (logbook and trip ticket, respectively) contain plots of trip specific landings in the Florida East Coast Zone (FECZ) under the 25 fish trip limit. In this case, not only do trips with >75% king mackerel appear to frequently reach the trip limit, but a relatively large proportion of the trips (given the small sample size) with 50-75% king mackerel also appear to reach the trip limit. Those trips may have switched fishing strategy to target another species after the king mackerel trip limit was reached. Fishing effort for such trips cannot be reliably apportioned among species, therefore data from the FECZ during periods with a 25 fish trip limit were excluded when constructing the Mixing Zone commercial indices.

Most of the other area – trip limit combinations had frequency distributions of trips by pounds of king mackerel landed that followed the pattern seen for the Keys zone under a 500 pound trip limit (Figures 10-11). A large portion of the >75% king mackerel landings trips reached or exceeded the trip limit. Trips classified in the other three targeting categories rarely reached the trip limit. Under this scenario the trip limits likely do not affect fishing effort for trips landing less than 75% king mackerel and including those data, therefore, will not adversely affect index construction. Those trips that fell within the >75% targeting category were assumed to catch king mackerel until the trip limit was reached and then returned to port with little or no additional fishing effort directed at other species. Data from all trips in the Keys zone under a 500 pound trip limit may be included for index construction. All area – trip limit combinations, other than the FECZ 25 fish trip limit, were judged appropriate for use in index construction provided hours fished data were available.

Table 1. King Mackerel recreational fishing regulations.

Fishing Year			Bag Limit		Closures		
Year	Atlantic	Gulf	Size Limit	Atlantic	Gulf	Atlantic	Gulf
1983-1984 ¹			--	--	--	--	--
1984-1985 ¹			--	--	--	--	--
1985-1986 ²	4/1 - 3/31	7/1 - 6/30	--	--	--	--	--
1986-1987	4/1 - 3/31	7/1 - 6/30	--	Private = 2/person/trip; Charterboat = greater of 2/person incl capt&crew or 3/person excl capt&crew		--	--
1987-1988	4/1 - 3/31	7/1 - 6/30	--	3/person/trip	"	Closed 12/16/87 0100h Reopened 7/1/1988 0001h	
1988-1989	4/1 - 3/31	7/1 - 6/30	--	2/person/trip FL & 3 GA to NC	"	Closed 10/17/88 0100h Reopened 4/1/89 0001h	Closed 12/17/88 0001h Reopened 7/1/1989 0001h
1989-1990	4/1 - 3/31	7/1 - 6/30	--	2/person/trip FL & 3 GA to NC	"		
1990-1991 ³	4/1 - 3/31	7/1 - 6/30	12 in FL or 14 in TL	2 FL; 3 GA-NY	Same as above ⁴	Closed 12/20/90 0001h Reopened 7/1/1991 0001h	
1991-1992	4/1 - 3/31	7/1 - 6/30	12 in FL or 14 in TL	5 FL-NY	"	Closed 01/13/92 Reopened 7/1/1992	
1992-1993	4/1 - 3/31	7/1 - 6/30	20 in FL	2 FL; 5 GA-NY	2 per person including captain & crew		--
1993	Calendar Year		20 in FL	"	"		--
1994	Calendar Year		20 in FL	"	"		--
1995	Calendar Year		20 in FL	2 FL; 3 GA-NY	"		--
1996	Calendar Year		20 in FL	"	"		--
1997	Calendar Year		20 in FL	"	2 per person, 0 capt&crew as of 6-97		--
1998	Calendar Year		20 in FL	"	2 per person, 2 capt&crew as of 2-98		--
1999	Calendar Year		24 in FL	"	2 per person, 0 capt&crew as of 9-99		--
2000	Calendar Year		24 in FL	"	2 per person, 2 capt&crew as of 6-00		--
2001	Calendar Year		24 in FL	"	"		--
2002	Calendar Year		24 in FL	"	"		--
2003	Calendar Year		24 in FL	"	"		--
2004	Calendar Year		24 in FL	"	"		--
2005	Calendar Year		24 in FL	"	"		--
2006	Calendar Year		24 in FL	"	"		--
2007	Calendar Year		24 in FL	"	"		--

¹One stock

²Two management groups (Atlantic & Gulf migratory) from this point forward

³Management area expands from TX through NC to TX through NY

⁴Redefined as daily bag limits; 1-day possession except for-hire on multi-day can have 2-day possession

Table 2. King mackerel commercial fishing regulations: effective dates of minimum size limits

Size Limit	W-GOM	FLWC	FLWC-N	FLWC-S	KEYS	FECZ	SA
12"	7/1/1990	7/1/1990	n/a	n/a	4/1/1990	4/1/1990	4/1/1990
20"	7/1/1992	7/1/1992	n/a	n/a	4/1/1992	4/1/1992	4/1/1992
24"	7/1/1999	7/1/1999	4/27/2000	4/27/2000	4/1/1999	4/1/1999	4/1/1999

Table 3. King mackerel commercial fishing regulations: effective dates of regional fishery closures. Regions defined below.

W-GOM		FLWC		FECZ		KEYS		SA	
open	close	open	close	open	close	open	close	open	close
	5/6/1983		3/12/1986		3/12/1986		3/12/1986		11/23/1988
7/1/1983	3/12/1986	7/1/1986	2/4/1987	4/1/1986	2/4/1987	4/1/1986	2/4/1987	4/1/1989	3/29/1998
7/1/1986	2/4/1987	7/1/1987	1/27/1994	4/1/1987	12/29/1987	4/1/1987	1/27/1994	4/1/1998	
7/1/1987	11/2/1987	7/1/1994	12/20/1994	4/1/1988	12/31/1988	4/1/1994	12/20/1994		
7/1/1988	12/3/1988	2/7/1995	2/22/1995	4/1/1989	1/9/1990	2/7/1995	2/22/1995		
7/1/1989	10/25/1989	7/1/1995	2/22/1996	4/1/1990	1/4/1991	4/1/1995	2/22/1996		
7/1/1990	10/18/1990	7/1/1996	1/22/1997	4/1/1991	1/31/1992	4/1/1996	1/22/1997		
7/1/1991	9/29/1991	7/1/1997	1/7/1998	4/1/1992	1/13/1993	4/1/1997	1/7/1998		
7/1/1992	10/18/1992	2/20/1998	3/5/1998	2/18/1993	3/27/1993	2/20/1998	3/5/1998		
7/1/1993	10/1/1993	7/1/1998	3/16/1999	4/1/1993	3/29/1998	4/1/1998	3/16/1999		
7/1/1994	9/24/1994	7/1/1999	3/6/2000	4/1/1998	3/13/1999	4/1/1999	3/6/2000		
7/1/1995	9/5/1995	FLWC-S		4/1/1999		4/1/2000	3/2/2001		
7/1/1996	8/26/1996		4/27/2000			4/1/2001	3/23/2002		
7/1/1997	8/2/1997	7/1/2000	3/2/2001			4/1/2002	3/12/2006		
2/20/1998	3/29/1998	7/1/2001	3/23/2002			4/1/2006			
7/1/1998	8/25/1998	7/1/2002	4/9/2004						
7/1/1999	8/25/1999	7/1/2004	3/12/2006						
7/1/2000	8/26/2000	7/1/2006							
7/1/2001	11/20/2001	FLWC-N							
7/1/2002	10/26/2002		4/27/2000						
7/1/2003	9/25/2003	7/1/2000	11/19/2000						
7/1/2004	10/21/2004	7/1/2001	11/11/2001						
7/1/2005	11/18/2005	7/1/2002	12/6/2002						
7/1/2006	10/7/2006	7/1/2003	11/14/2003						
		7/1/2004							

W-GOM=western Gulf of Mexico (Texas/Mexico border to Alabama/Florida border)

FLWC=Florida west coast (ceased to exist 4/27/00; Alabama/Florida border to Collier/Monroe county border)

FLWC-N=Florida west coast north (effective 4/27/00; Alabama/Florida border to Lee/Collier county border)

FLWC-S=Florida west coast south (effective 4/27/00; Collier county)

Keys=Monroe county

FECZ=Florida east coast zone (Monroe/Dade county border to Volusia/Flagler county border)

SA=south Atlantic (Volusia/Flagler county border to North Carolina/Virginia border)

Table 4. King mackerel commercial fishing regulations: effective dates of regional trip limit changes. Gaps in the time series represent periods when the fishery was closed.

W-GOM			FLWC			SA		
limit	start	end	limit	start	end	limit	start	end
none		6/30/2000	none		12/28/1993	none		3/31/1995
3,000 lbs	7/1/2000		50 fish	12/29/1993	6/30/1994	3,500 lbs	4/1/1995	
			none	7/1/1994	2/6/1995			
			125 fish	2/7/1995	2/21/1995			
			125 fish	7/1/1995	1/23/1996			
			50 fish	1/24/1996	2/21/1996			
			1250 lbs	7/1/1996	12/31/1996			
			500 lbs	1/1/1997	1/21/1997			
			1250 lbs	7/1/1997	11/27/1997			
			500 lbs	11/28/1997	1/6/1998			
			500 lbs	2/20/1998	3/4/1998			
			1250 lbs	7/1/1998	1/29/1999			
			500 lbs	1/30/1999	3/15/1999			
			1250 lbs	7/1/1999	1/23/2000			
			500 lbs	1/24/2000	3/5/2000			
			FLWC-S			FLWC-N		
			1250 lbs	7/1/2000	2/19/2001	1250 lbs	7/1/2000	11/11/2000
			500 lbs	2/20/2001	3/1/2001	500 lbs	11/12/2000	11/18/2000
			1250 lbs	7/1/2001	3/10/2002	1250 lbs	7/1/2001	11/10/2001
			500 lbs	3/11/2002	3/22/2002	1250 lbs	7/1/2002	11/29/2002
			1250 lbs	7/1/2003	3/4/2003	500 lbs	11/30/2002	12/5/2002
			500 lbs	3/5/2003	6/30/2003	1250 lbs	7/1/2003	10/29/2003
			1250 lbs	7/1/2003	3/19/2004	500 lbs	10/30/2003	11/13/2003
			500 lbs	3/20/2004	4/8/2004	1250 lbs	7/1/2004	11/26/2006
			1250 lbs	7/1/2004	2/24/2005	500 lbs	11/27/2006	
			500 lbs	2/25/2005	6/30/2005			
			1250 lbs	7/1/2005	2/24/2006			
			500 lbs	2/25/2006	3/11/2006			
			1250 lbs	7/1/2006				

Table 4 (continued). King mackerel commercial fishing regulations: effective dates of regional trip limit changes. Gaps in the time series represent periods when the fishery was closed.

KEYS			FECZ		
limit	start	end	limit	start	end
none		12/28/1993	none		1/12/1993
50 fish	12/29/1993	1/26/1994	25 fish	2/18/1993	3/26/1993
none	4/1/1994	12/19/1994	none	4/1/1993	10/31/1993
125 fish	2/7/1995	2/21/1995	50 fish	11/1/1993	3/31/1994
50 fish	4/1/1995	10/31/1995	none	4/1/1994	10/31/1994
125 fish	11/1/1995	1/23/1996	50 fish	11/1/1994	3/14/1996
50 fish	1/24/1996	2/21/1996	25 fish	3/15/1996	3/31/1996
50 fish	4/1/1996	10/31/1996	50 fish	4/1/1996	10/31/1996
1250 lbs	11/1/1996	12/31/1996	750 lbs	11/1/1996	2/28/1997
500 lbs	1/1/1997	1/21/1997	500 lbs	3/1/1997	3/31/1997
1250 lbs	4/1/1997	11/27/1997	50 fish	4/1/1997	3/28/1998
500 lbs	11/28/1997	1/6/1998	50 fish	4/1/1998	3/12/1999
500 lbs	2/20/1998	3/4/1998	50 fish	4/1/1999	3/31/2000
1250 lbs	4/1/1998	1/29/1999	75 fish	4/1/2000	10/31/2000
500 lbs	1/30/1999	3/15/1999	50 fish	11/1/2000	3/31/2001
1250 lbs	4/1/1999	1/23/2000	75 fish	4/1/2001	10/31/2001
500 lbs	1/24/2000	3/5/2000	50 fish	11/1/2001	1/31/2002
1250 lbs	4/1/2000	2/19/2001	75 fish	2/1/2002	10/31/2002
500 lbs	2/20/2001	3/1/2001	50 fish	11/1/2002	1/31/2003
1250 lbs	4/1/2001	3/10/2002	75 fish	2/1/2003	10/31/2003
500 lbs	3/11/2002	3/22/2002	50 fish	11/1/2003	1/31/2004
1250 lbs	4/1/2002	3/4/2003	75 fish	2/1/2004	10/31/2004
500 lbs	3/5/2003	3/31/2003	50 fish	11/1/2004	1/31/2005
1250 lbs	4/1/2003	3/19/2004	75 fish	2/1/2005	10/31/2005
500 lbs	3/20/2004	3/31/2004	50 fish	11/1/2005	1/31/2006
1250 lbs	4/1/2004	2/24/2005	75 fish	2/1/2006	10/31/2006
500 lbs	2/25/2005	3/31/2005	50 fish	11/1/2006	
1250 lbs	4/1/2005	2/24/2006			
500 lbs	2/25/2006	3/11/2006			
1250 lbs	4/1/2006				

Figure 2. Headboat bag limit ratio, by year, for positive trips in the “Atlantic” management region. The filled box indicates the 95% confidence intervals. The median is indicated by the line within the box. The range of the data is shown by the “whiskers”.

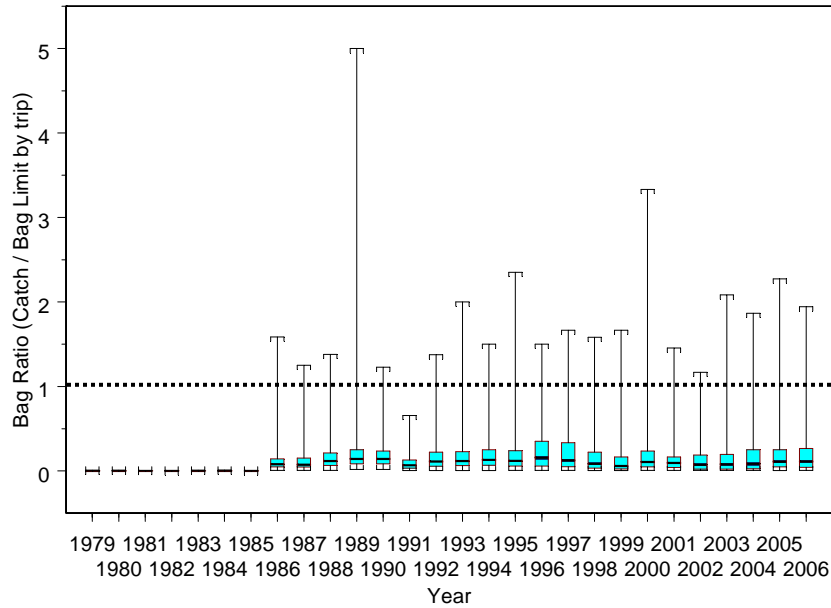


Figure 3. Headboat bag limit ratio, by year, for positive trips in the “Gulf” management region. The filled box indicates the 95% confidence intervals. The median is indicated by the line within the box. The range of the data is shown by the “whiskers”.

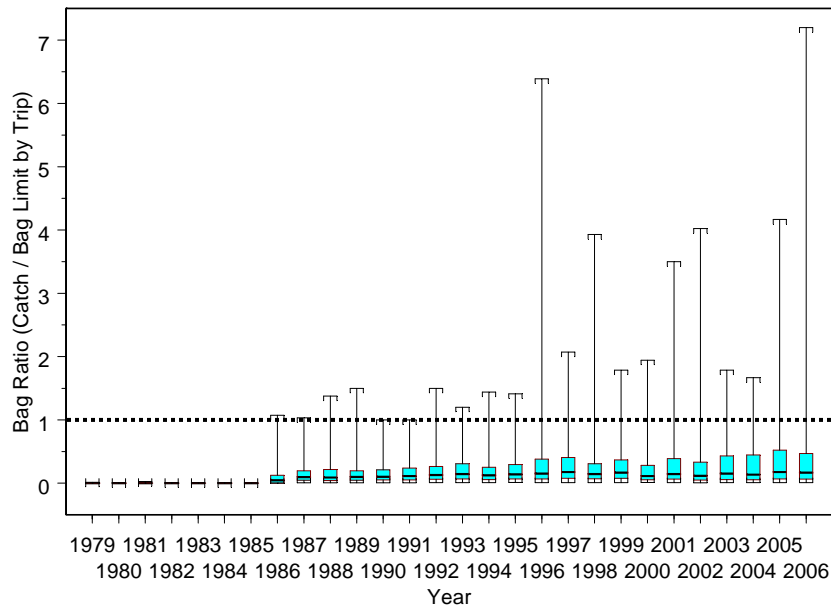


Figure 4. MRFSS bag limit ratio, by year, for positive trips in the “Atlantic” management region. The boxes indicate the 25th and 75th quartiles. The median is indicated by the line within the box. The 5th and 95th percentiles of the data are shown by the “whiskers”. Mean bag limit ratios are shown by the line connecting the years.

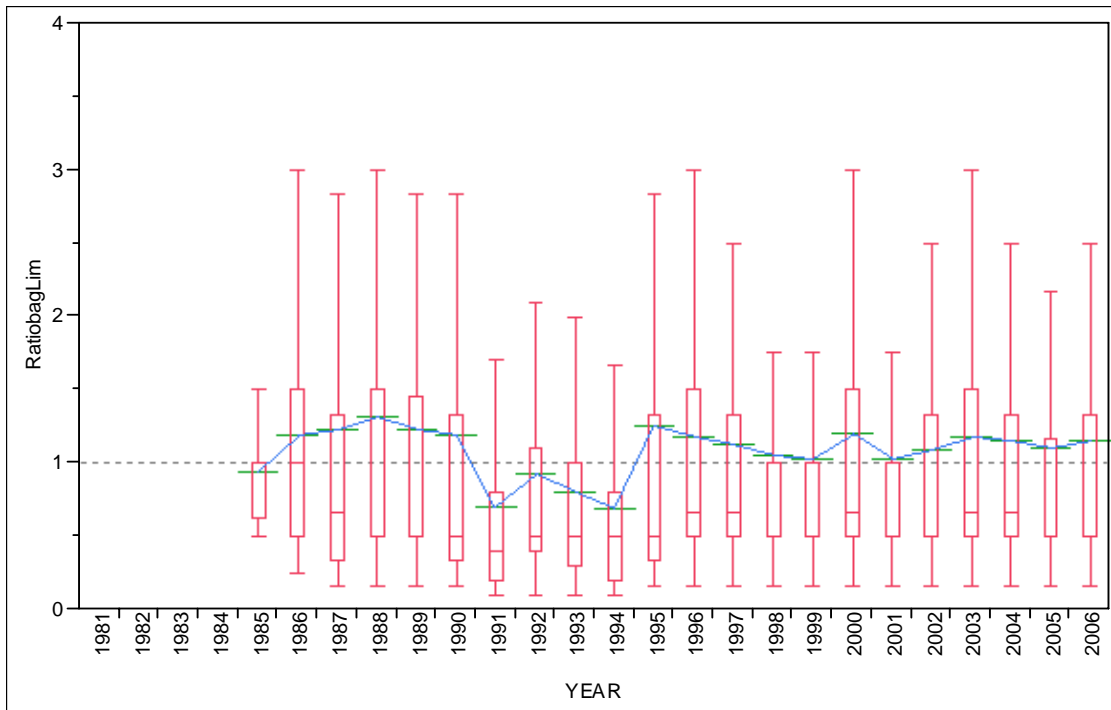


Figure 5. MRFSS bag limit ratio, by year, for positive trips in the “Gulf” management region. The boxes indicate the 25th and 75th quartiles. The median is indicated by the line within the box. The 5th and 95th percentiles of the data are shown by the “whiskers”. Mean bag limit ratios are shown by the line connecting the years.

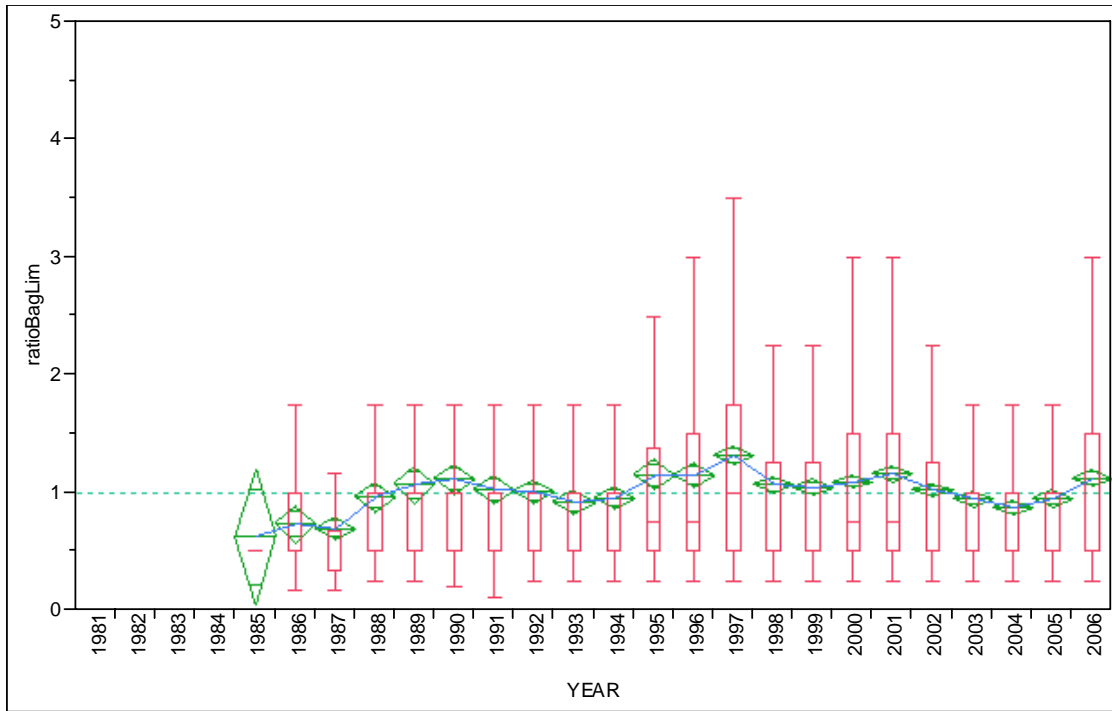
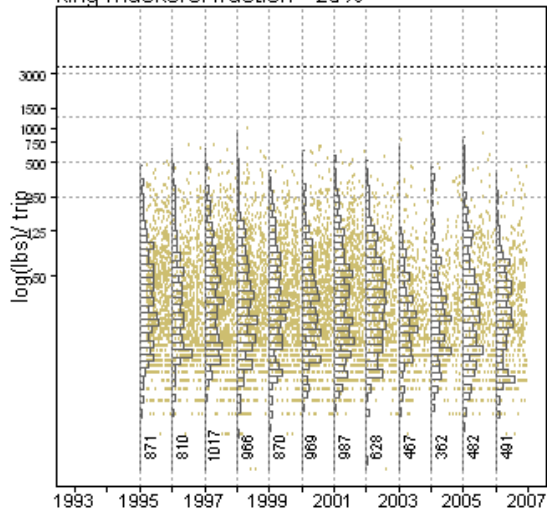
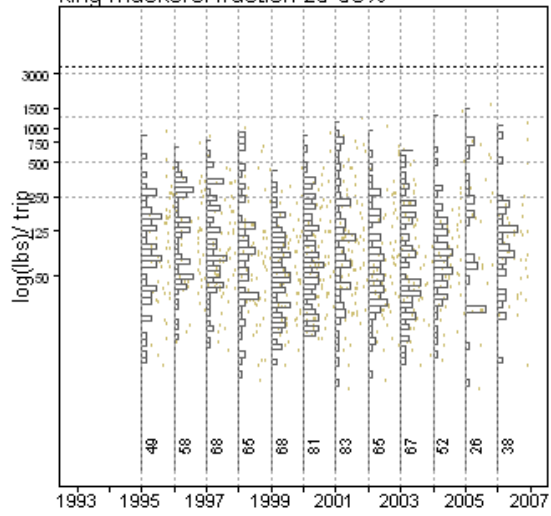


Figure 6. Number of trips by pounds landed (log scale) and year in the south Atlantic under a 3,500 pound trip limit. Data were from the coastal logbook program. The scatter plots are of individual trips. Histograms indicate frequency of trips by pounds landed and year. Numbers below histograms indicate numbers of trips. Trips were classified by the percentage of king mackerel to total landings for the trip. Trips with <25% king mackerel are shown in the upper left graph. The upper right graph has trips with 25-50% king mackerel; lower left 50-75%; and lower right >75% king mackerel.

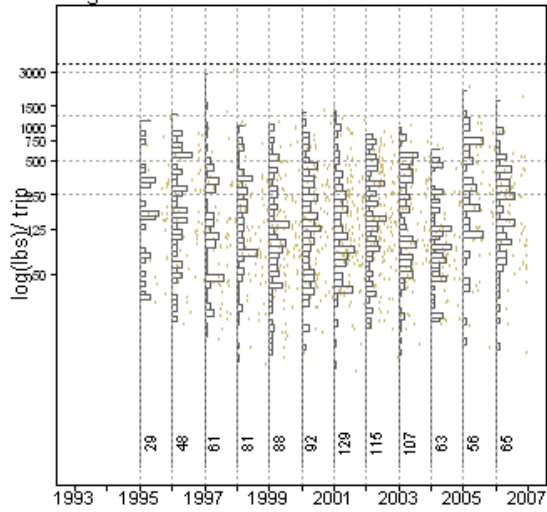
Logbook sa 3500 lbs
king mackerel fraction <25%



king mackerel fraction 25-50%



king mackerel fraction 50-75%



king mackerel fraction >75%

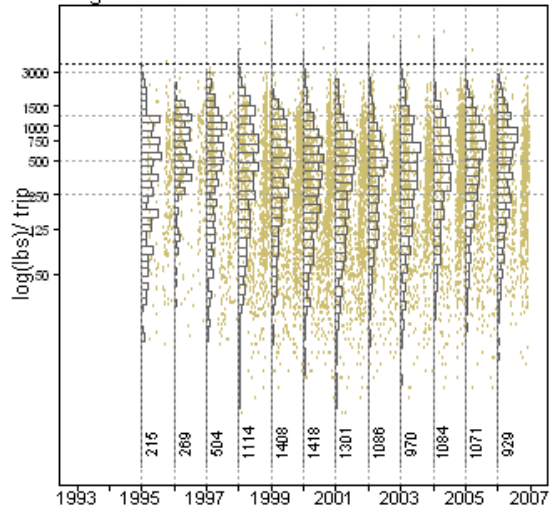


Figure 7. Number of trips by pounds landed (log scale) and year in the south Atlantic under a 3,500 pound trip limit. Data were from commercial trip tickets. The scatter plots are of individual trips. Histograms indicate frequency of trips by pounds landed and year. Numbers below histograms indicate numbers of trips. Trips were classified by the percentage of king mackerel to total landings for the trip. Trips with <25% king mackerel are shown in the upper left graph. The upper right graph has trips with 25-50% king mackerel; lower left 50-75%; and lower right >75% king mackerel.

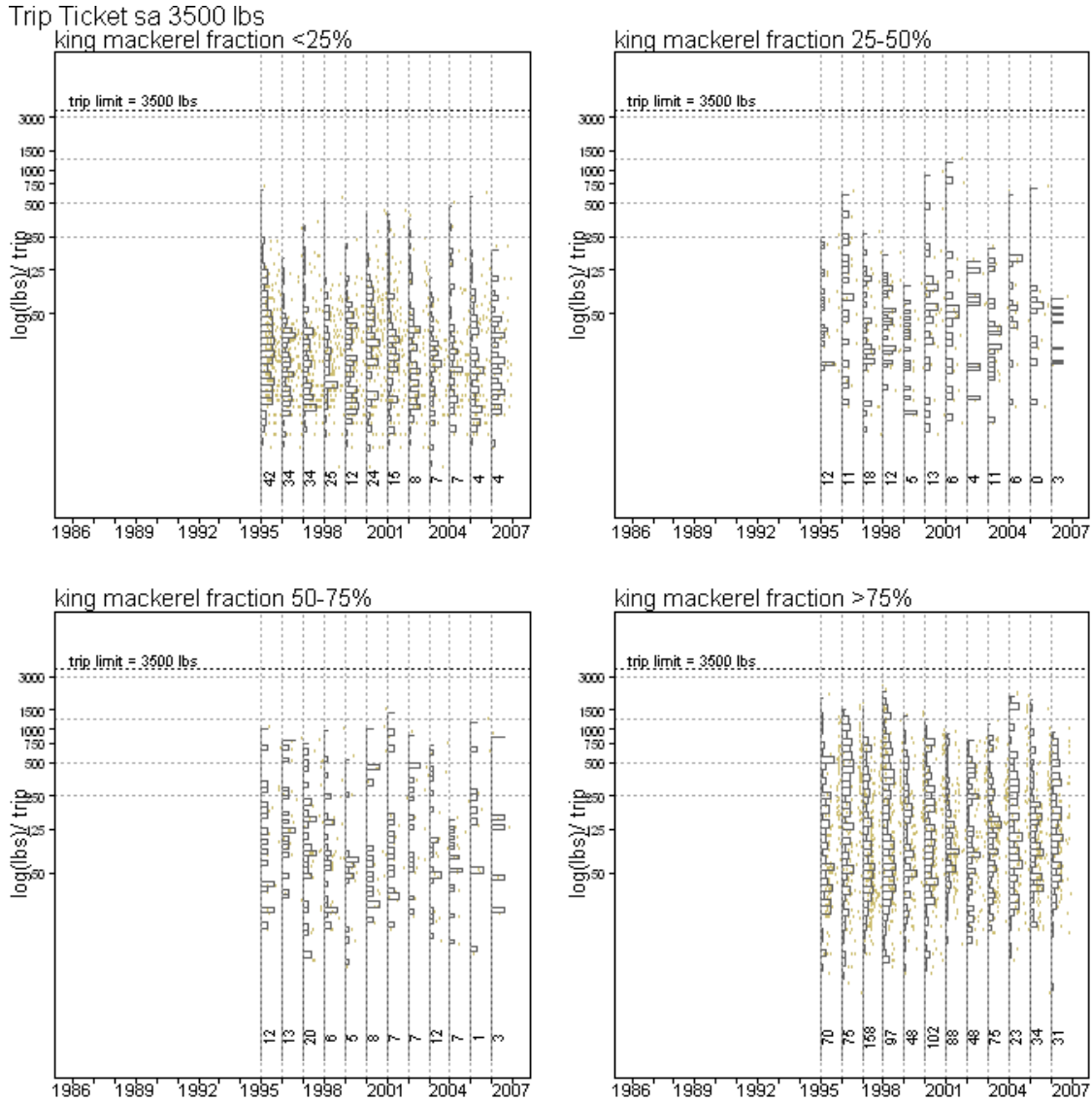


Figure 8. Number of trips by pounds landed (log scale) and year in the FECZ under a 25 fish trip limit. Data were from the coastal logbook program. The scatter plots are of individual trips. Histograms indicate frequency of trips by pounds landed and year. Numbers below histograms indicate numbers of trips. Trips were classified by the percentage of king mackerel to total landings for the trip. Trips with <25% king mackerel are shown in the upper left graph. The upper right graph has trips with 25-50% king mackerel; lower left 50-75%; and lower right >75% king mackerel.

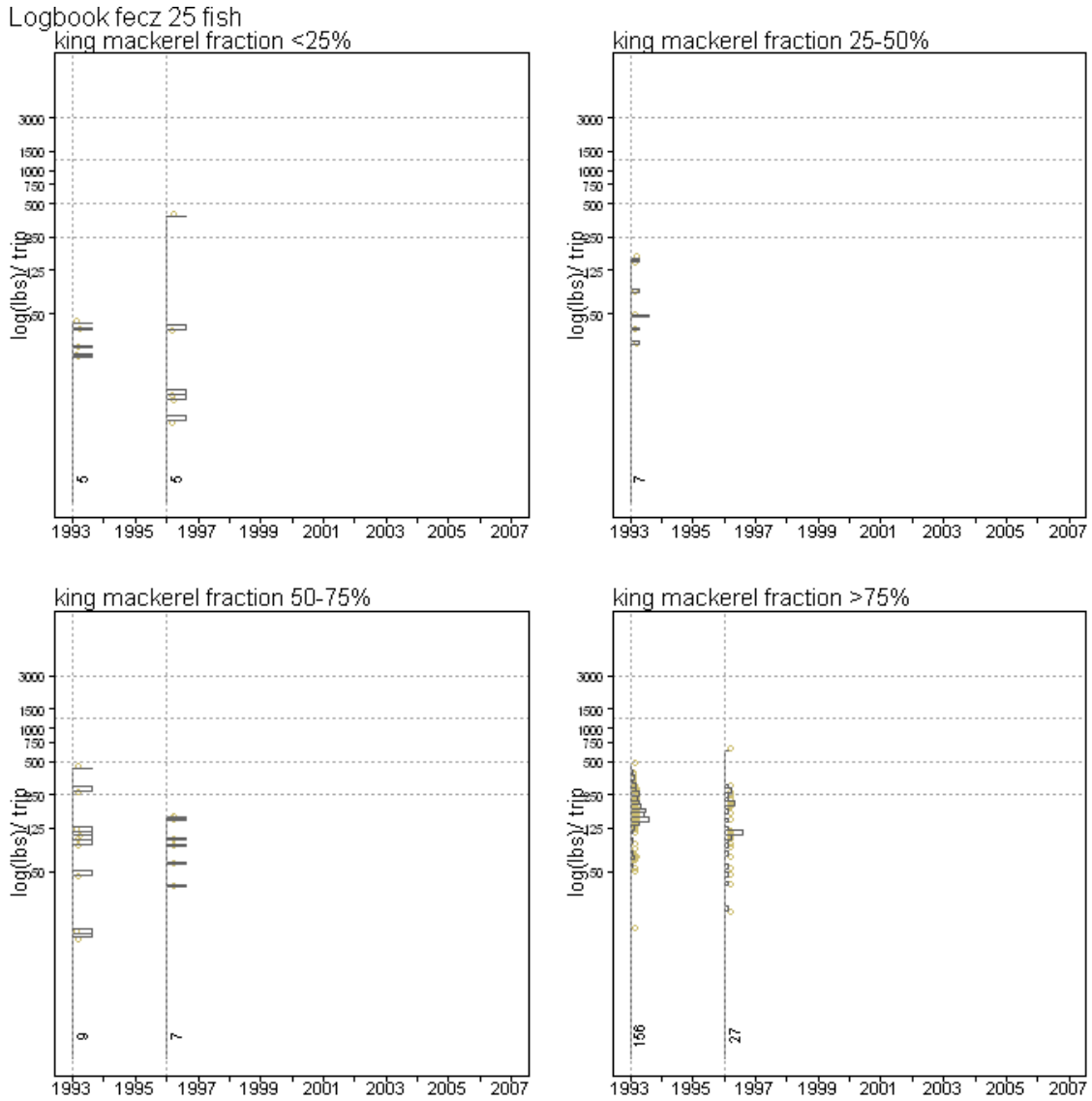


Figure 9. Number of trips by pounds landed (log scale) and year in the FECZ under a 25 fish trip limit. Data were from commercial trip tickets. The scatter plots are of individual trips. Histograms indicate frequency of trips by pounds landed and year. Numbers below histograms indicate numbers of trips. Trips were classified by the percentage of king mackerel to total landings for the trip. Trips with <25% king mackerel are shown in the upper left graph. The upper right graph has trips with 25-50% king mackerel; lower left 50-75%; and lower right >75% king mackerel.

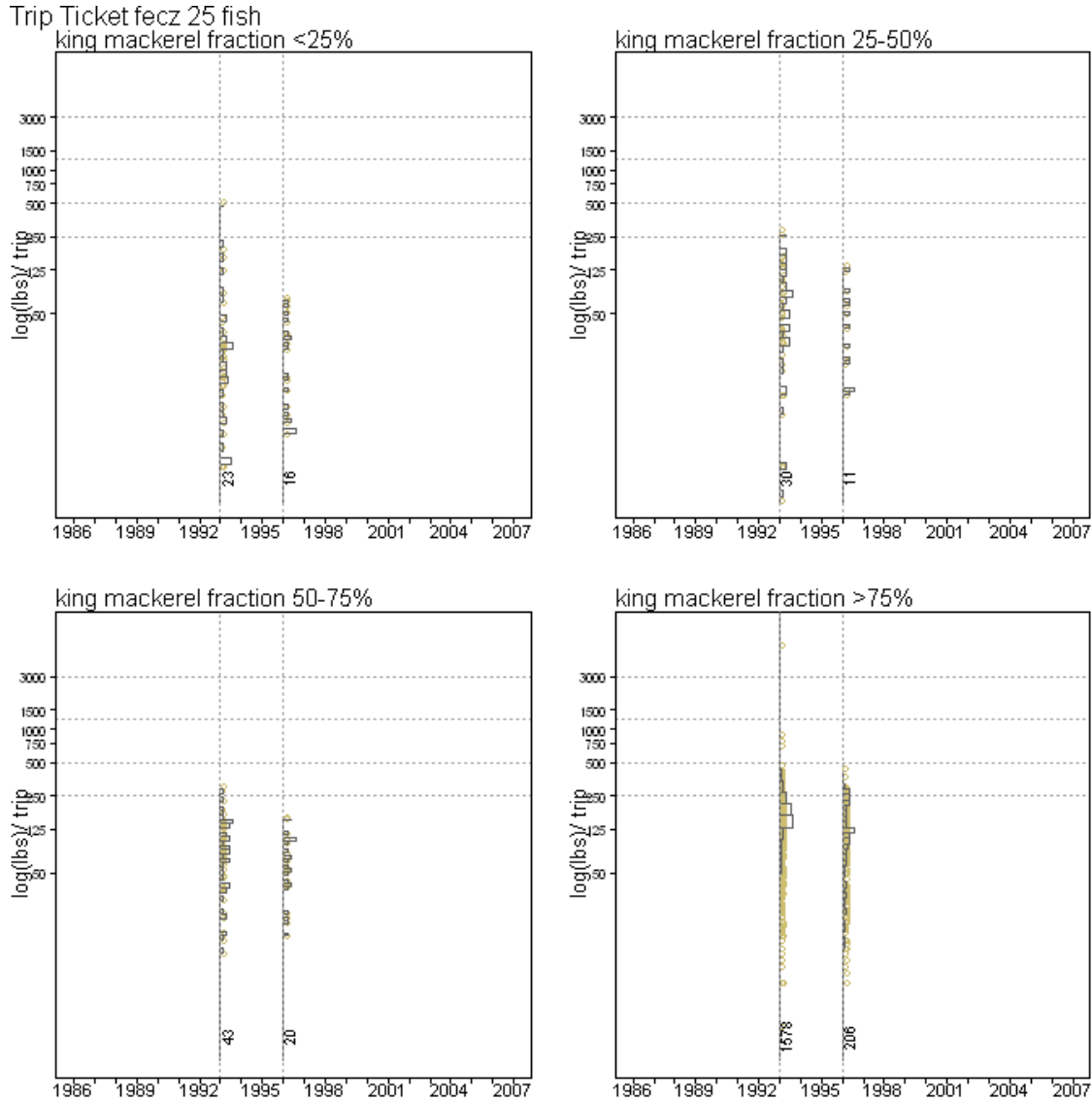


Figure 10. Number of trips by pounds landed (log scale) and year in the Keys under a 500 pound trip limit. Data were from the coastal logbook program. The scatter plots are of individual trips. Histograms indicate frequency of trips by pounds landed and year. Numbers below histograms indicate numbers of trips. Trips were classified by the percentage of king mackerel to total landings for the trip. Trips with <25% king mackerel are shown in the upper left graph. The upper right graph has trips with 25-50% king mackerel; lower left 50-75%; and lower right >75% king mackerel.

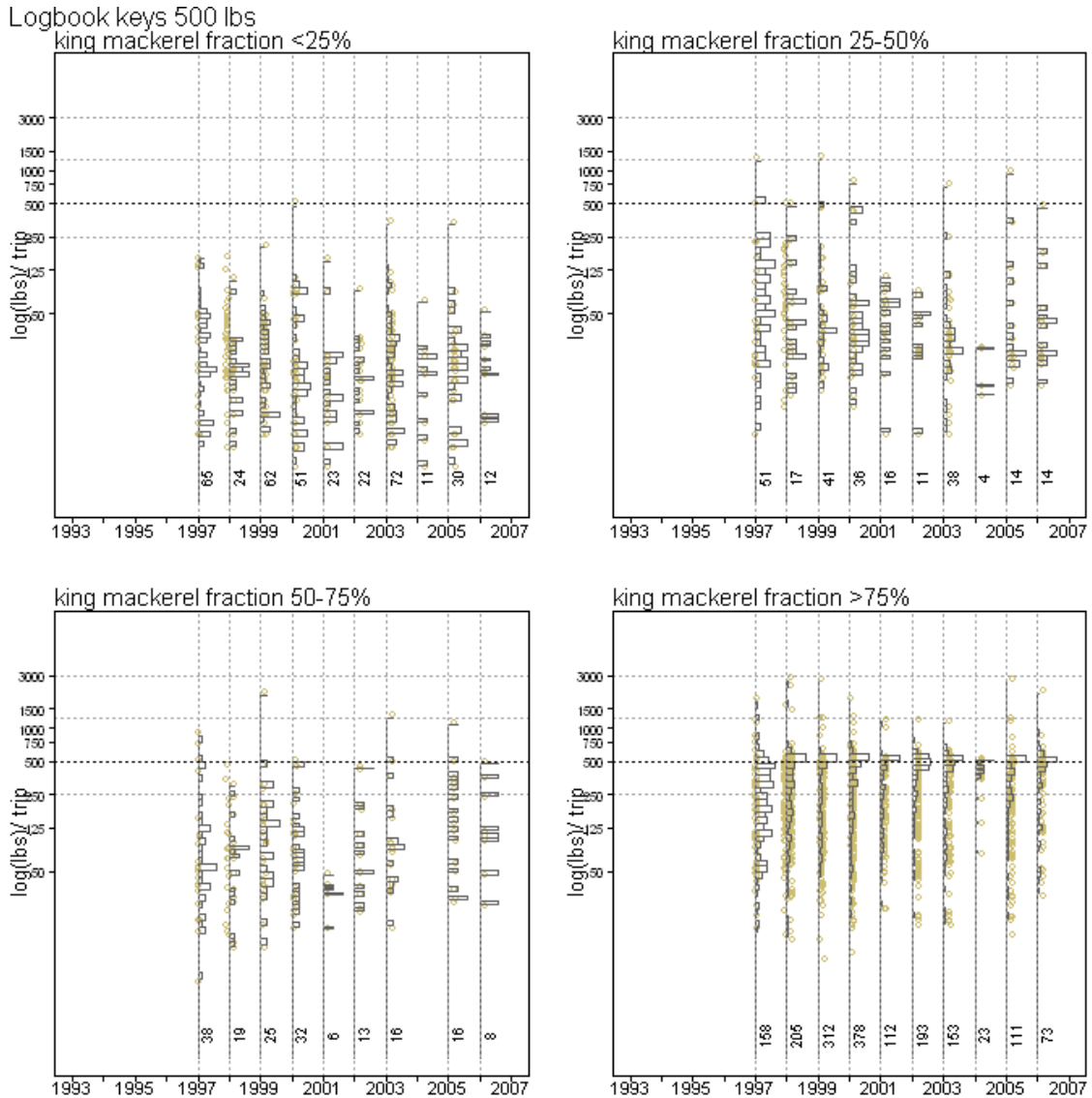
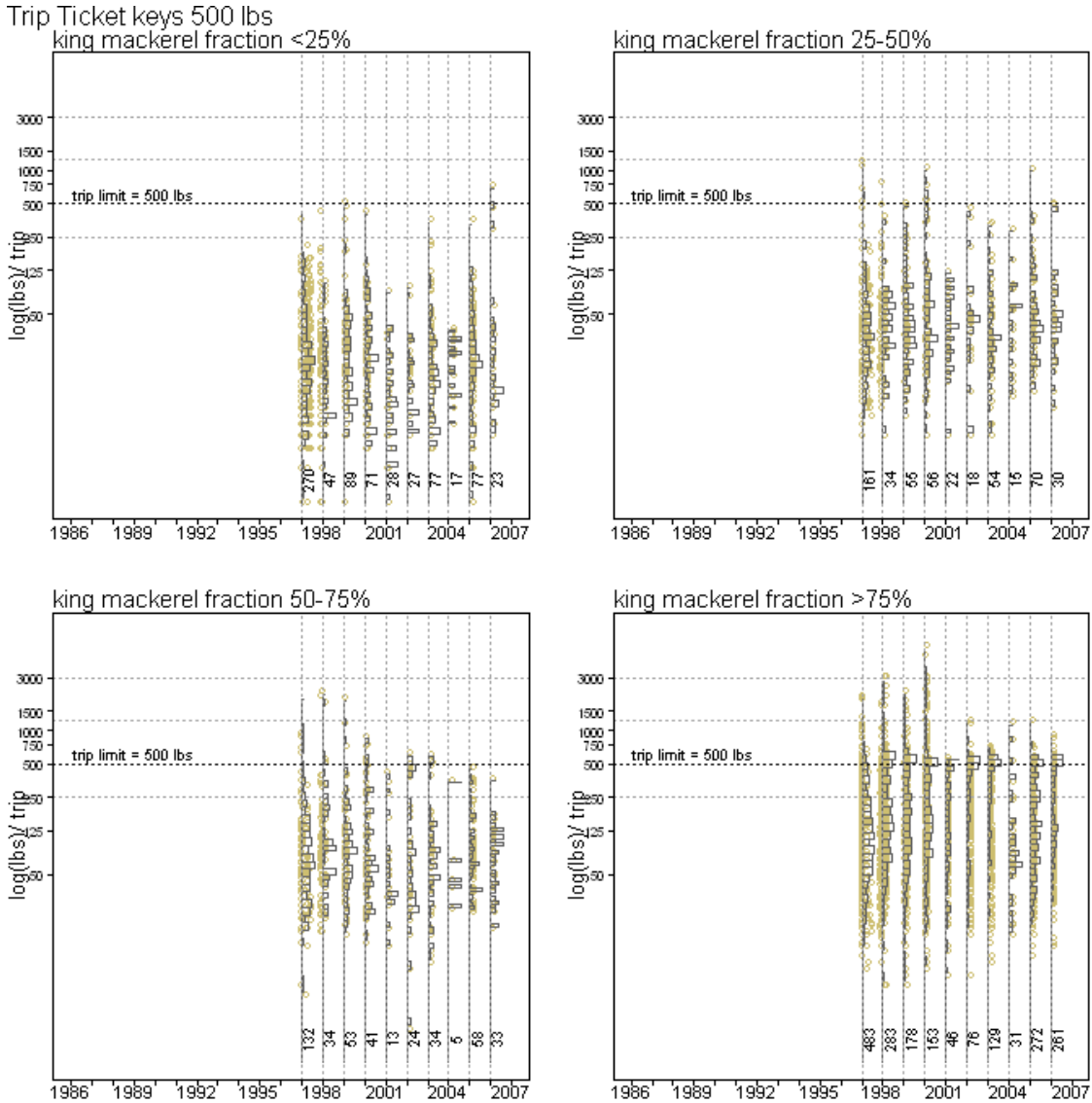


Figure 11. Number of trips by pounds landed (log scale) and year in the Keys under a 500 pound trip limit. Data were from commercial trip tickets. The scatter plots are of individual trips. Histograms indicate frequency of trips by pounds landed and year. Numbers below histograms indicate numbers of trips. Trips were classified by the percentage of king mackerel to total landings for the trip. Trips with <25% king mackerel are shown in the upper left graph. The upper right graph has trips with 25-50% king mackerel; lower left 50-75%; and lower right >75% king mackerel.



Appendix

In all figures the number of trips by pounds landed (log scale) and year are shown. The scatter plots are of individual trips. Histograms indicate frequency of trips by pounds landed and year. Numbers below histograms indicate numbers of trips. Trips were classified by the percentage of king mackerel to total landings for the trip. Trips with <25% king mackerel are shown in the upper left graph. The upper right graph has trips with 25-50% king mackerel; lower left 50-75%; and lower right >75% king mackerel. Data source, fishing area, and trip limit are provided for each graph.

Figure A1. Coastal logbook, South Atlantic 3,500 pound trip limit.

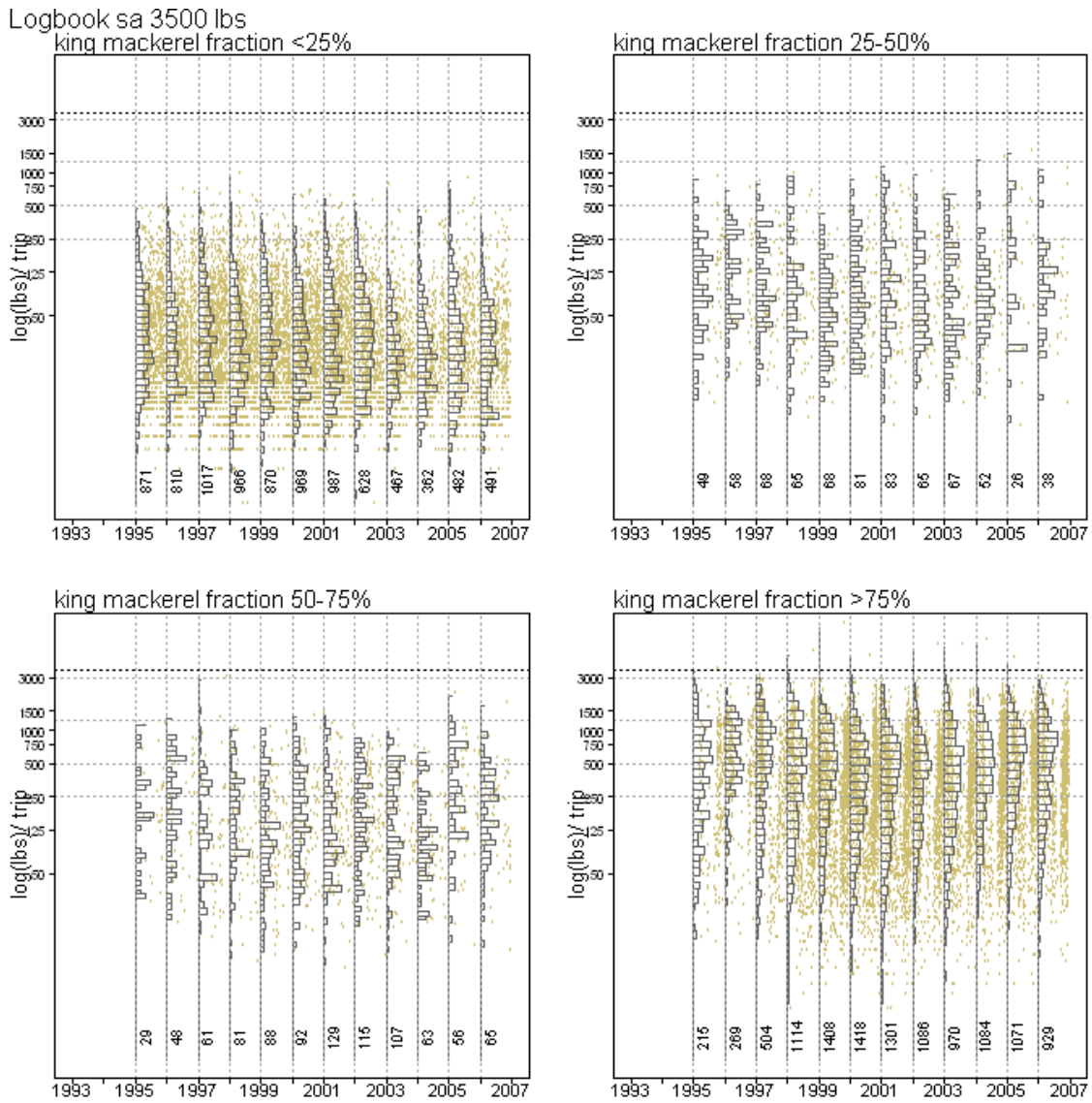


Figure A2. Coastal logbook, FECZ 25 fish trip limit.

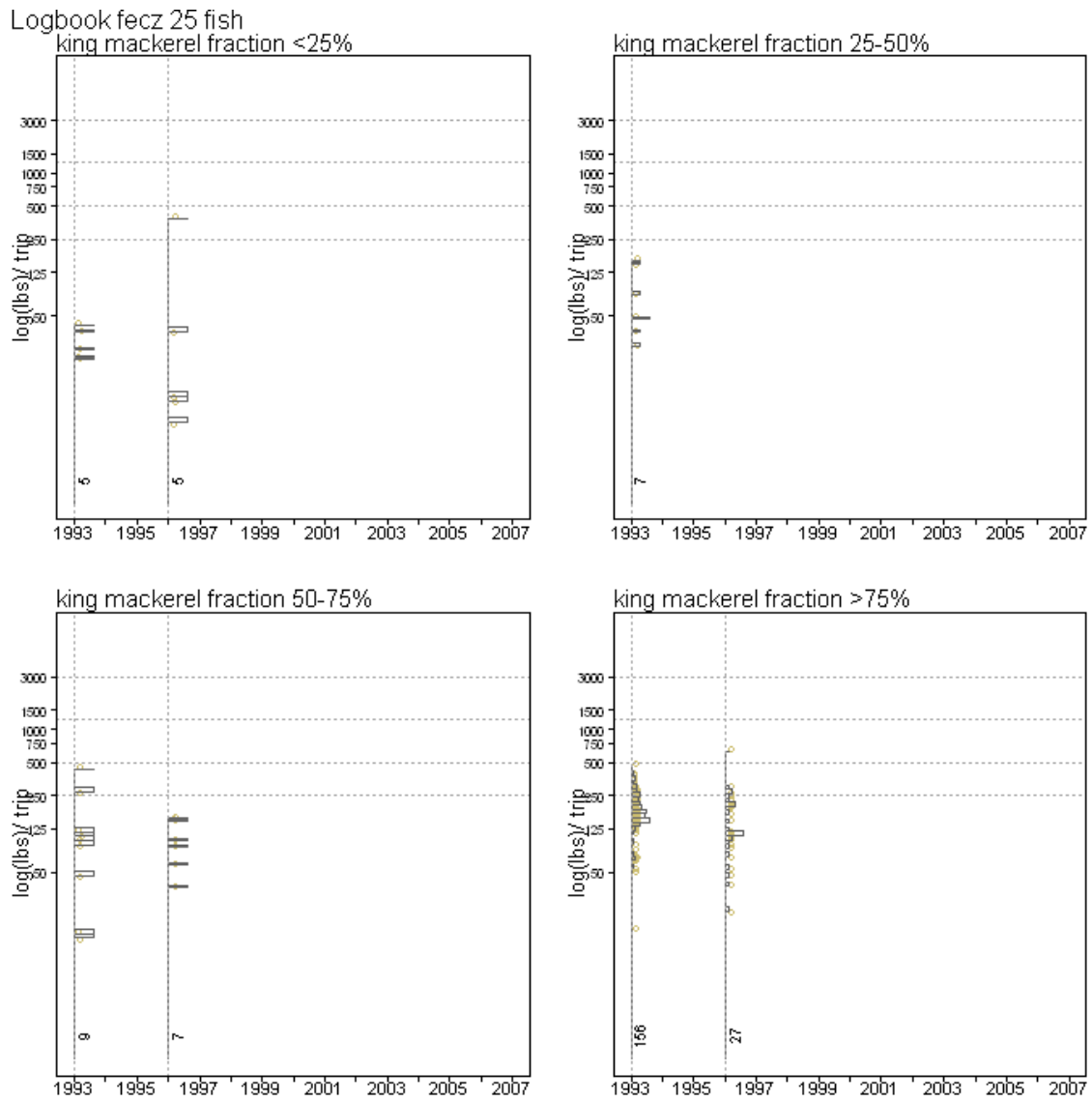


Figure A3. Coastal logbook, FECZ 50 fish trip limit.

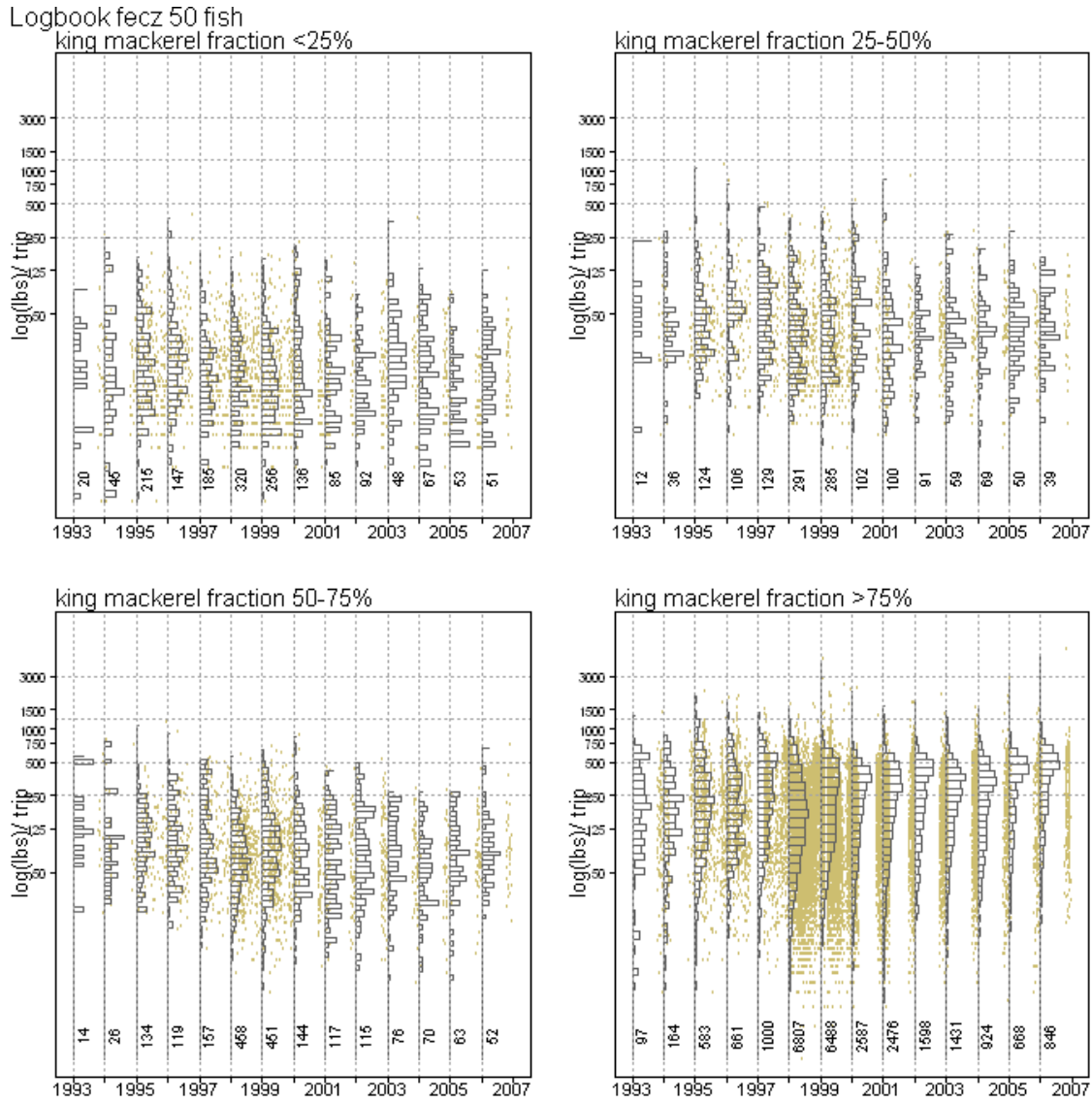


Figure A4. Coastal logbook, FECZ 75 fish trip limit.

Logbook fecz 75 fish

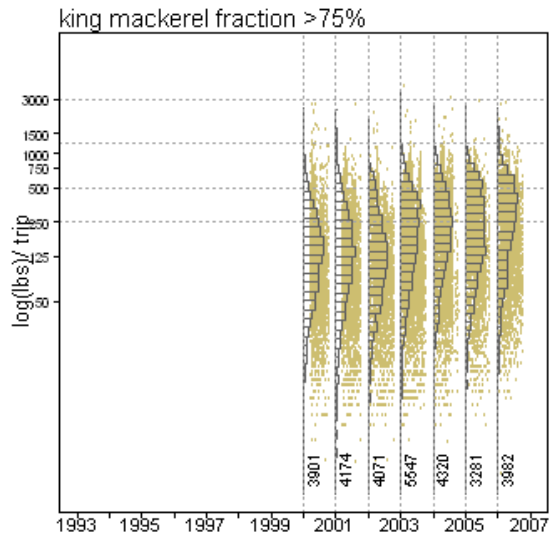
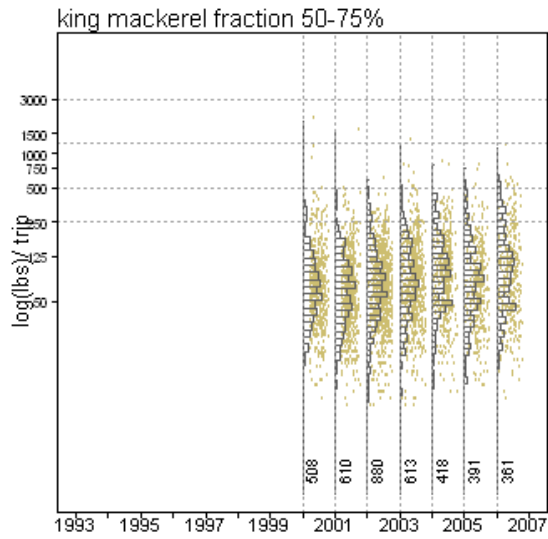
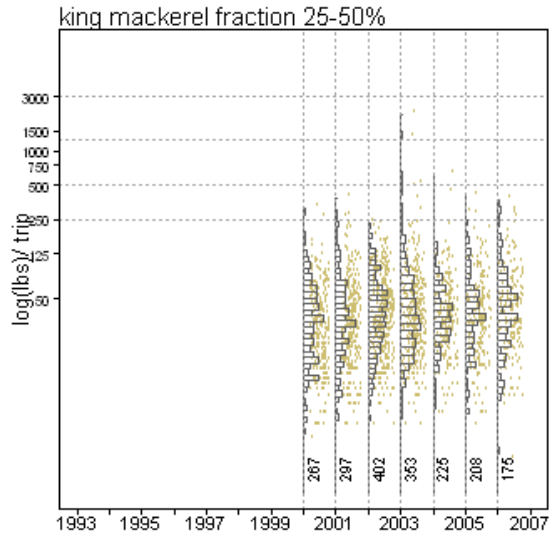
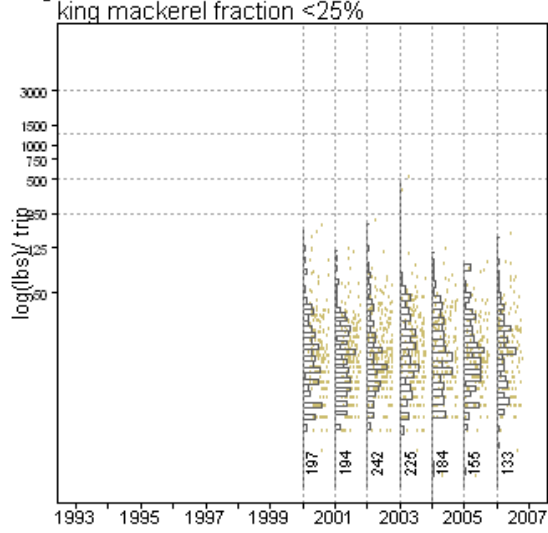


Figure A5. Coastal logbook, FECZ 500 pound trip limit.

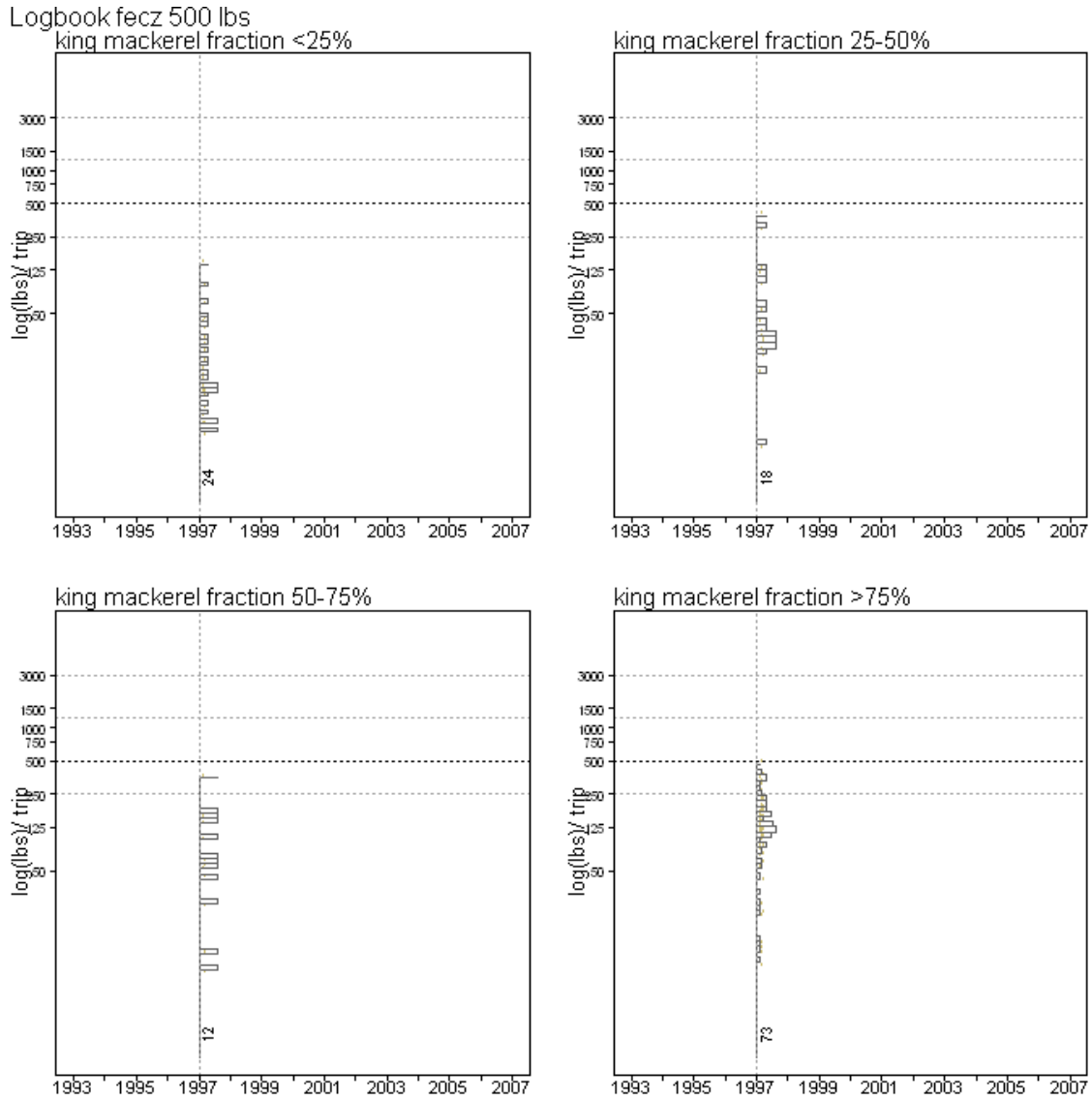


Figure A6. Coastal logbook, FECZ 750 pound trip limit.

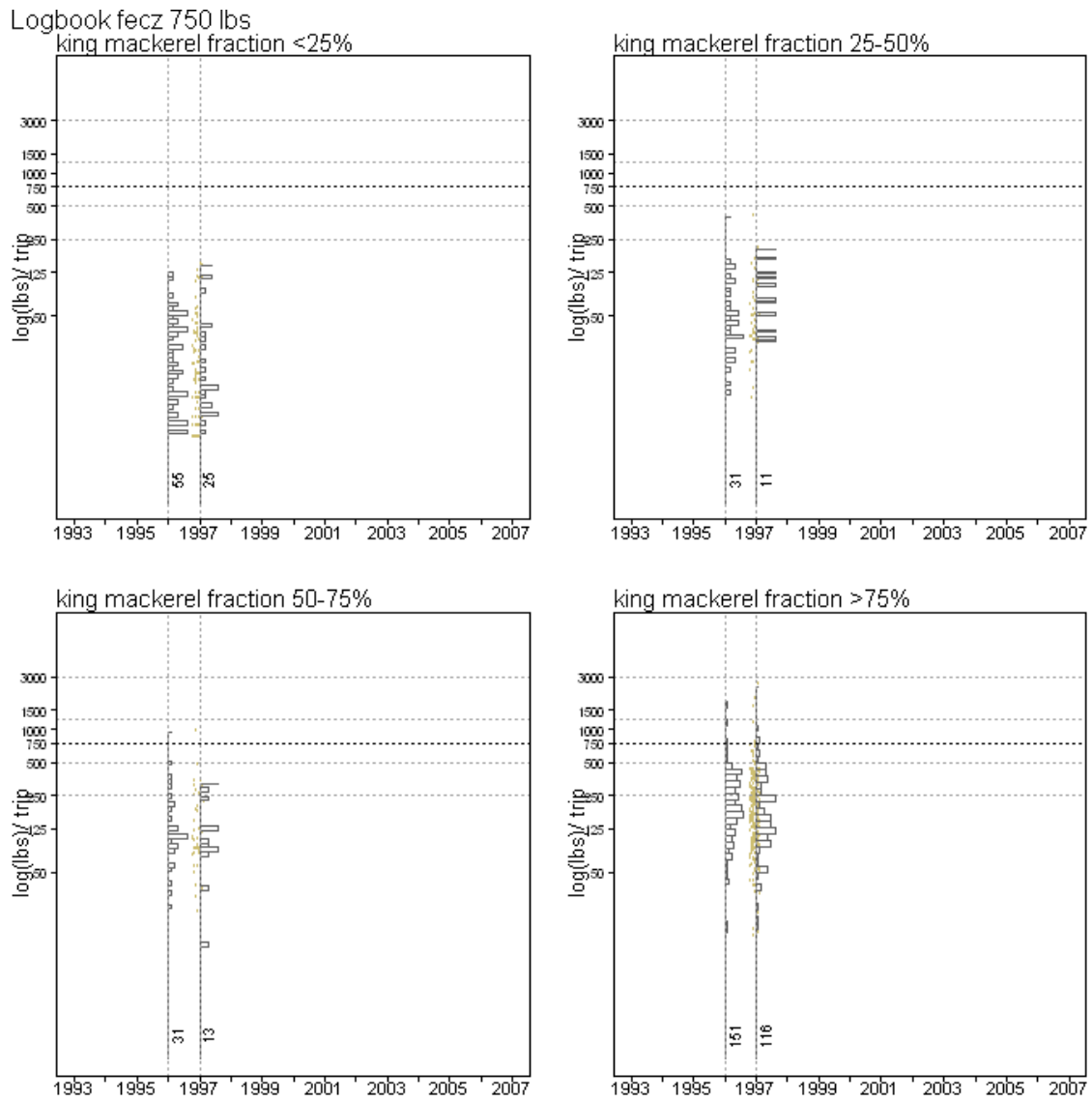


Figure A7. Coastal logbook, Keys 50 fish trip limit.

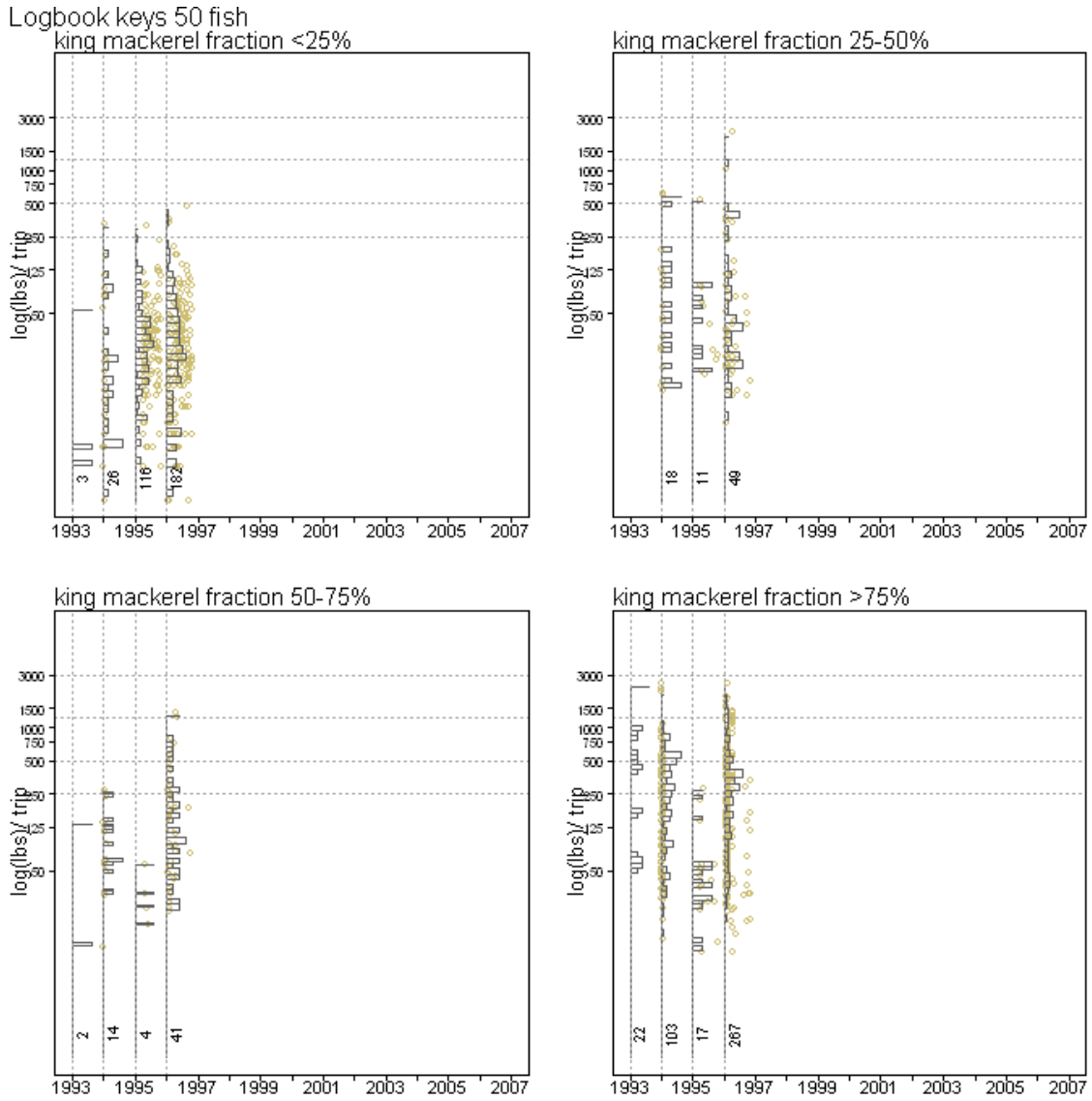


Figure A8. Coastal logbook, Keys 125 fish trip limit.

Logbook keys 125 fish

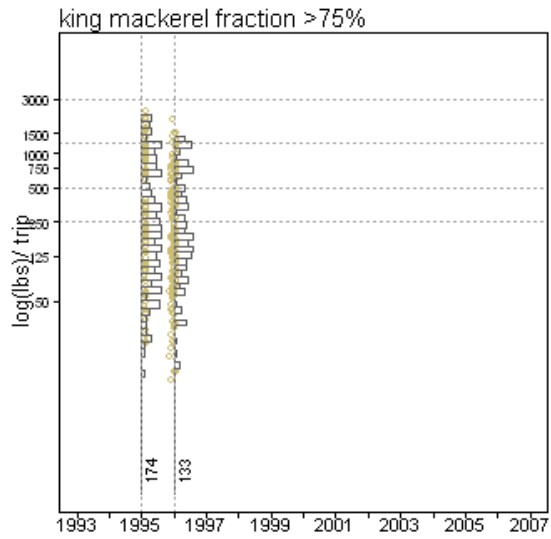
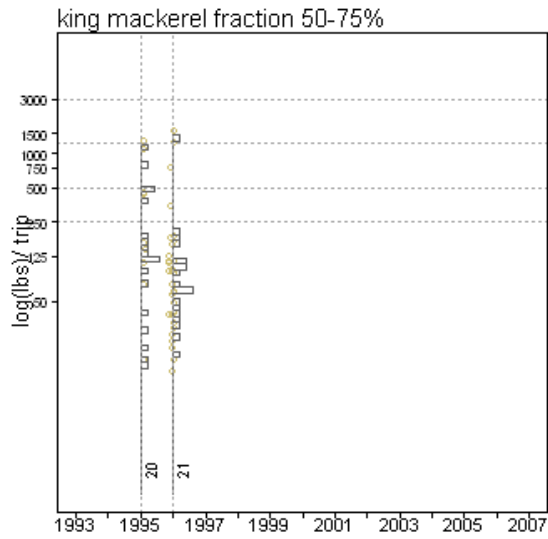
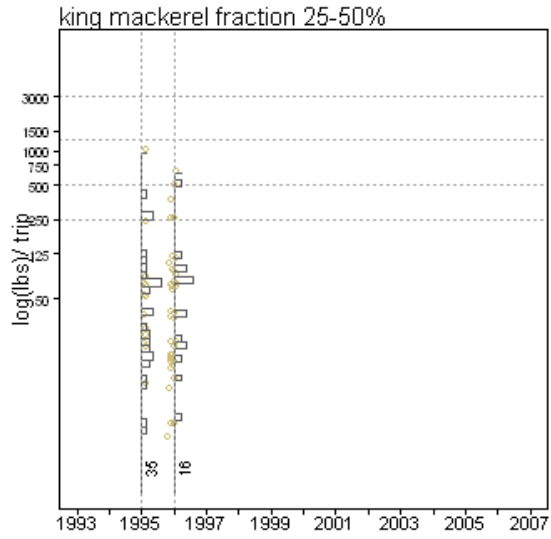
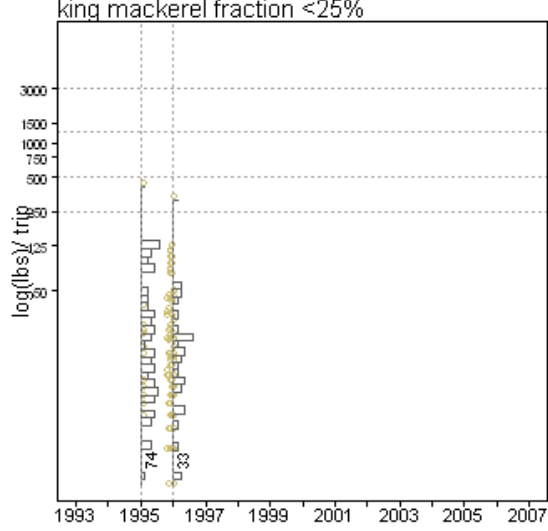


Figure 9A. Coastal logbook, Keys 500 pound trip limit.

Logbook keys 500 lbs

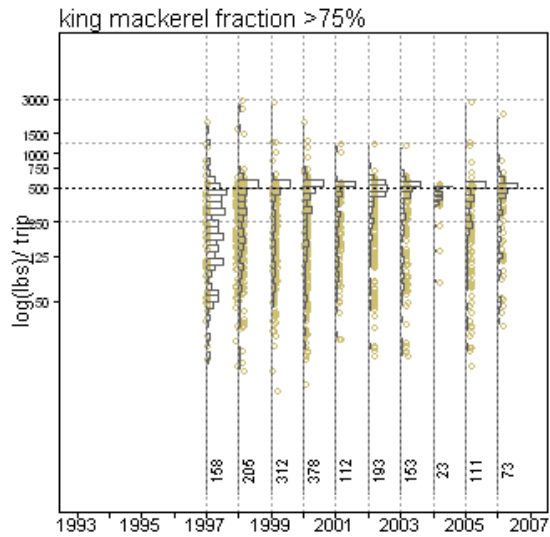
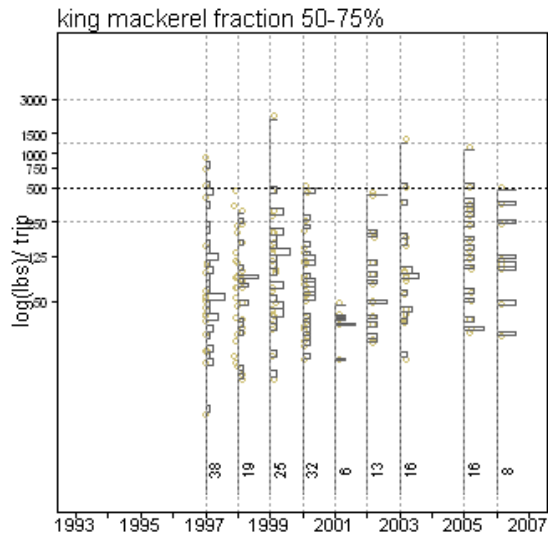
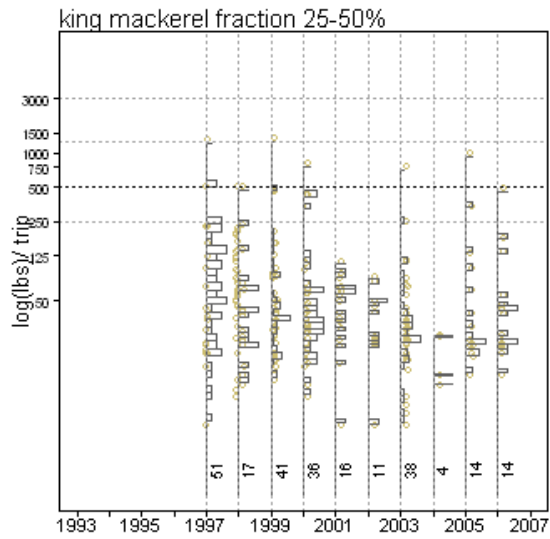
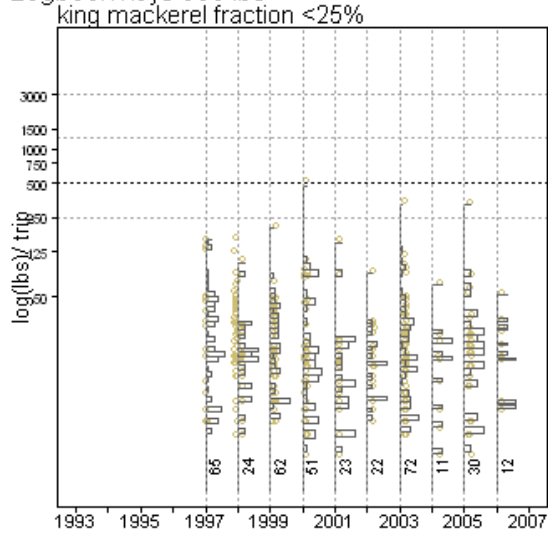


Figure 10A. Coastal logbook, Keys 1,250 pound trip limit.

Logbook keys 1250 lbs

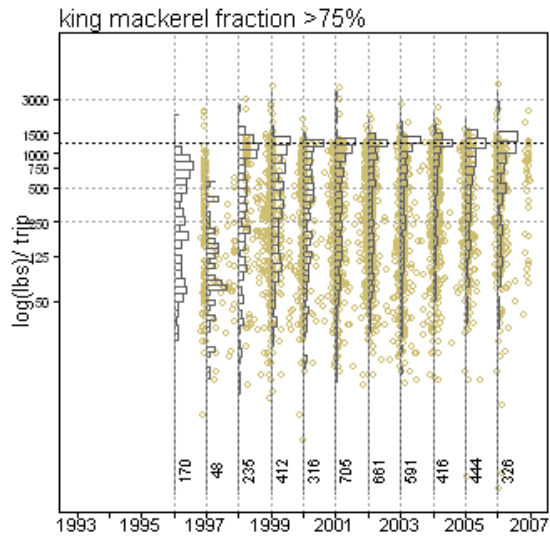
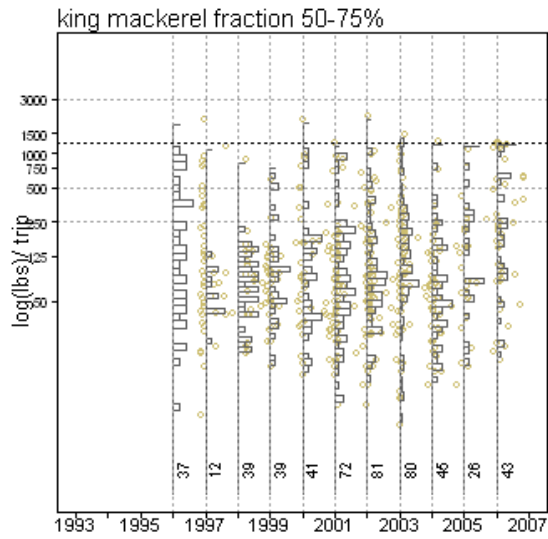
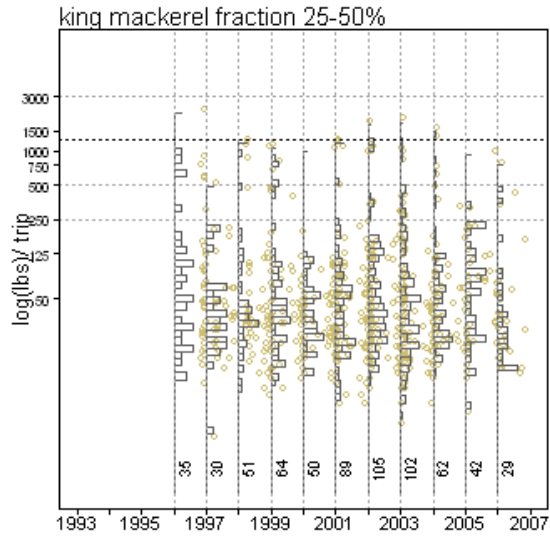
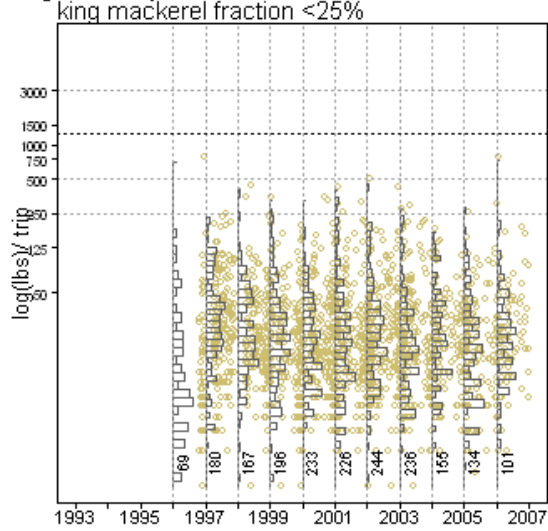


Figure 11A. Coastal logbook, FLWC 125 fish trip limit.

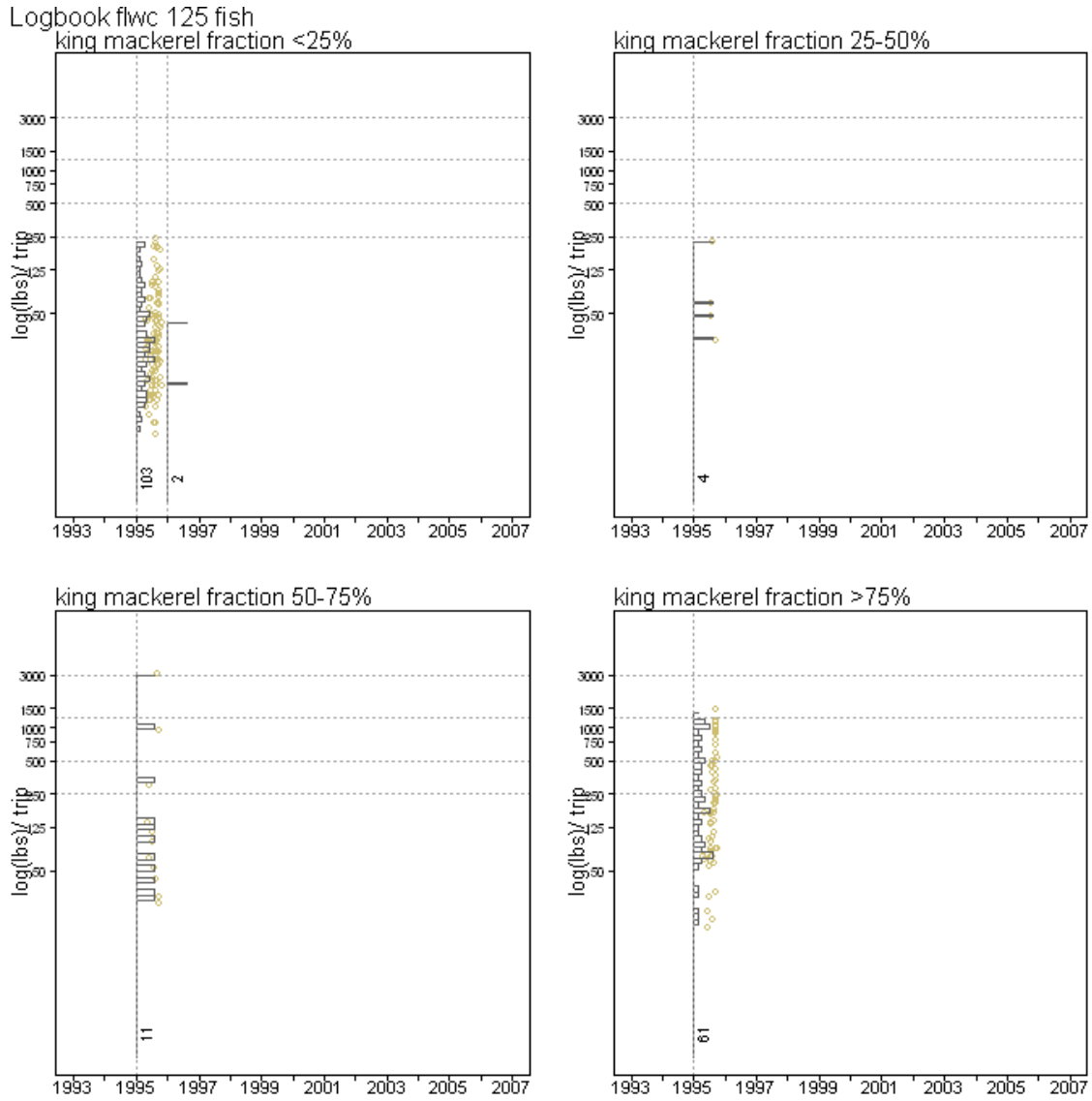


Figure 12A. Coastal logbook, FLWC 500 pound trip limit.

Logbook flwc 500 lbs

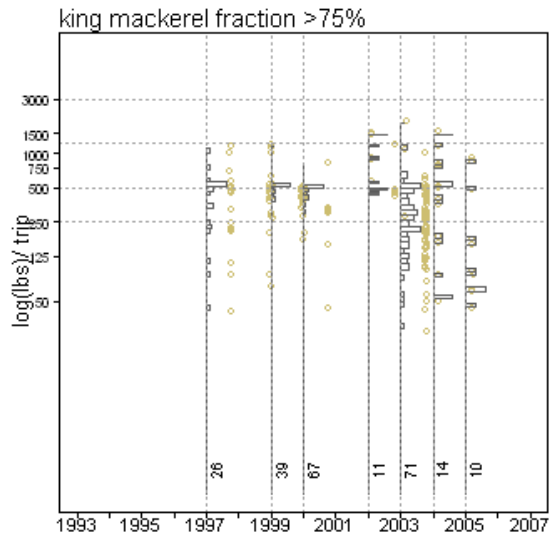
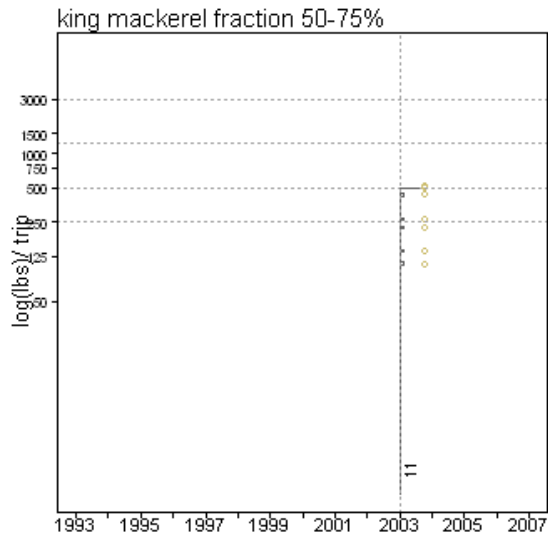
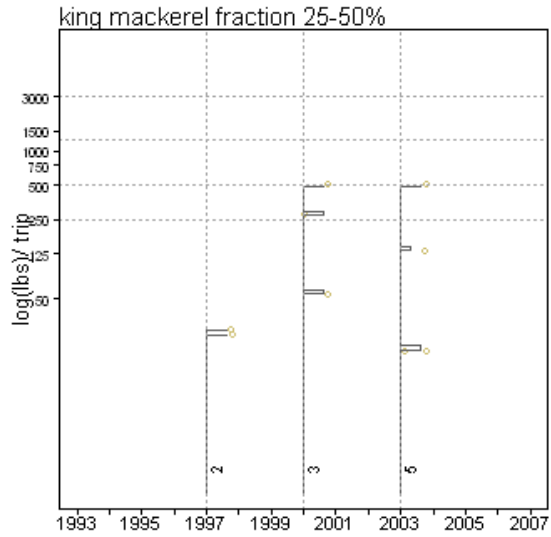
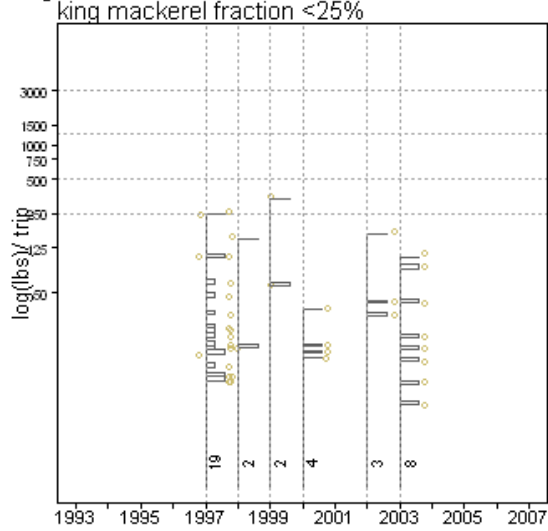


Figure 13A. Coastal logbook, FLWC 1,250 pound trip limit.

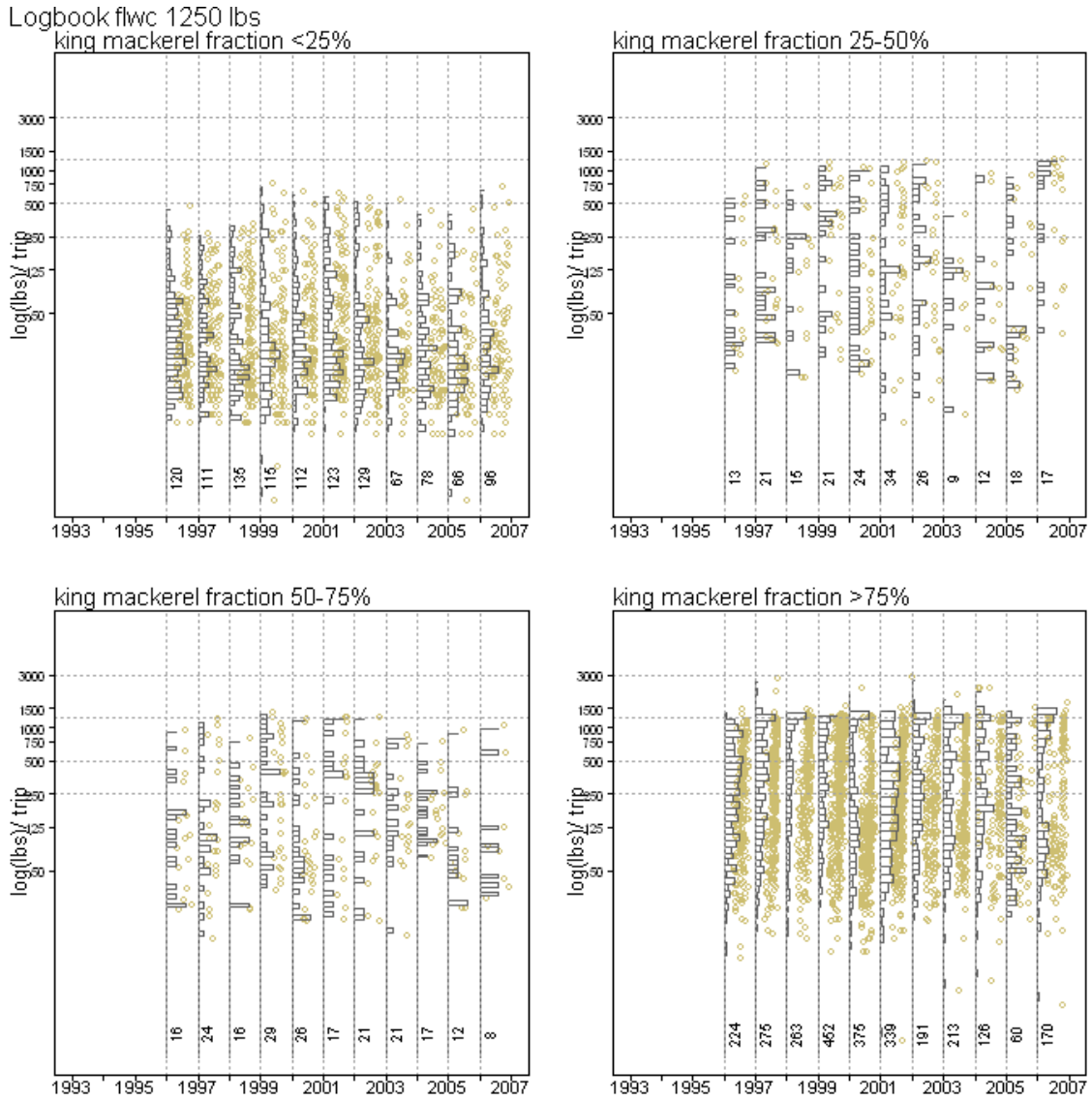


Figure 14A. Coastal logbook, Western Gulf of Mexico 3,000 pound trip limit.

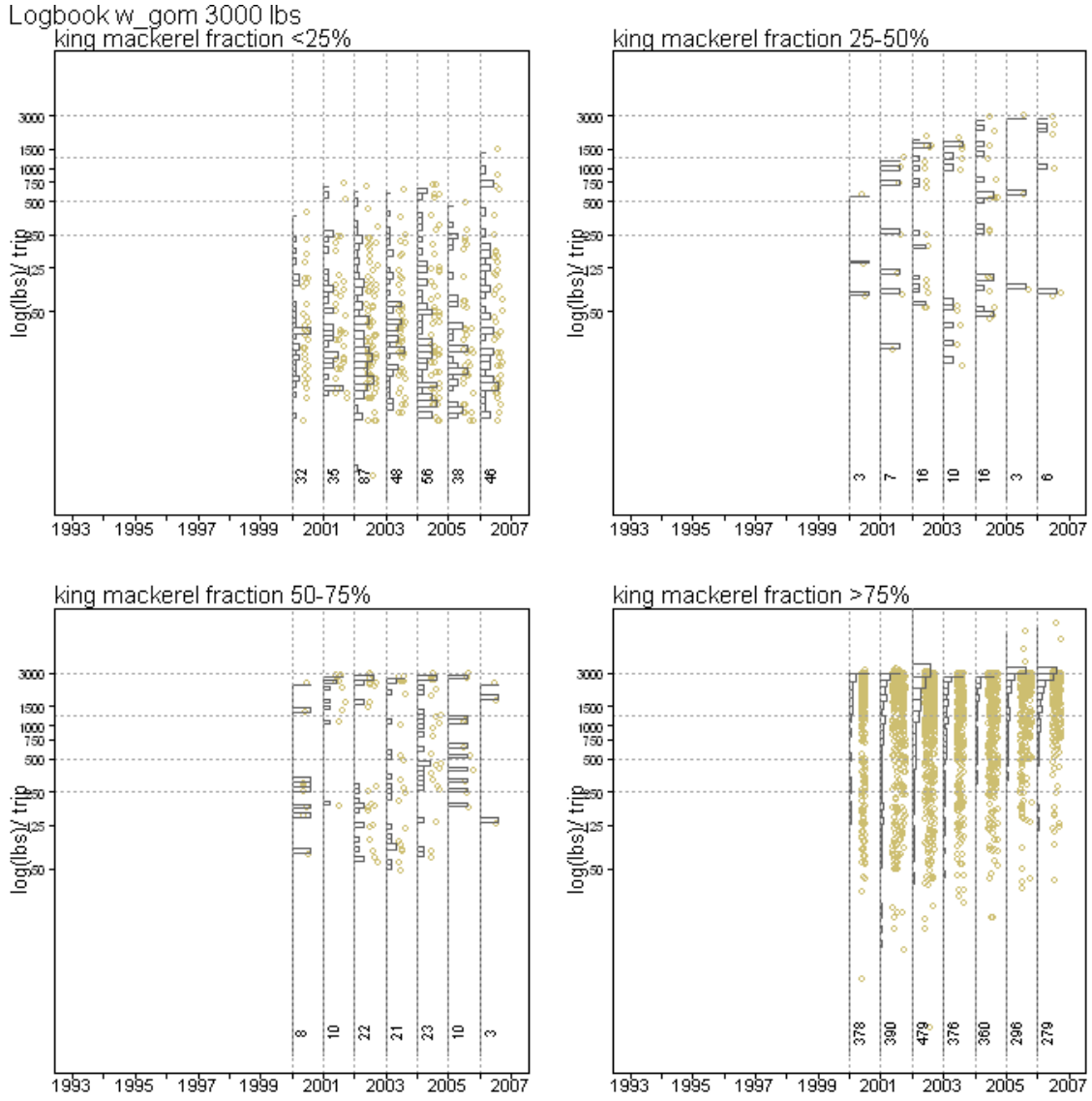


Figure 15A. Trip ticket, South Atlantic 3,500 pound trip limit.

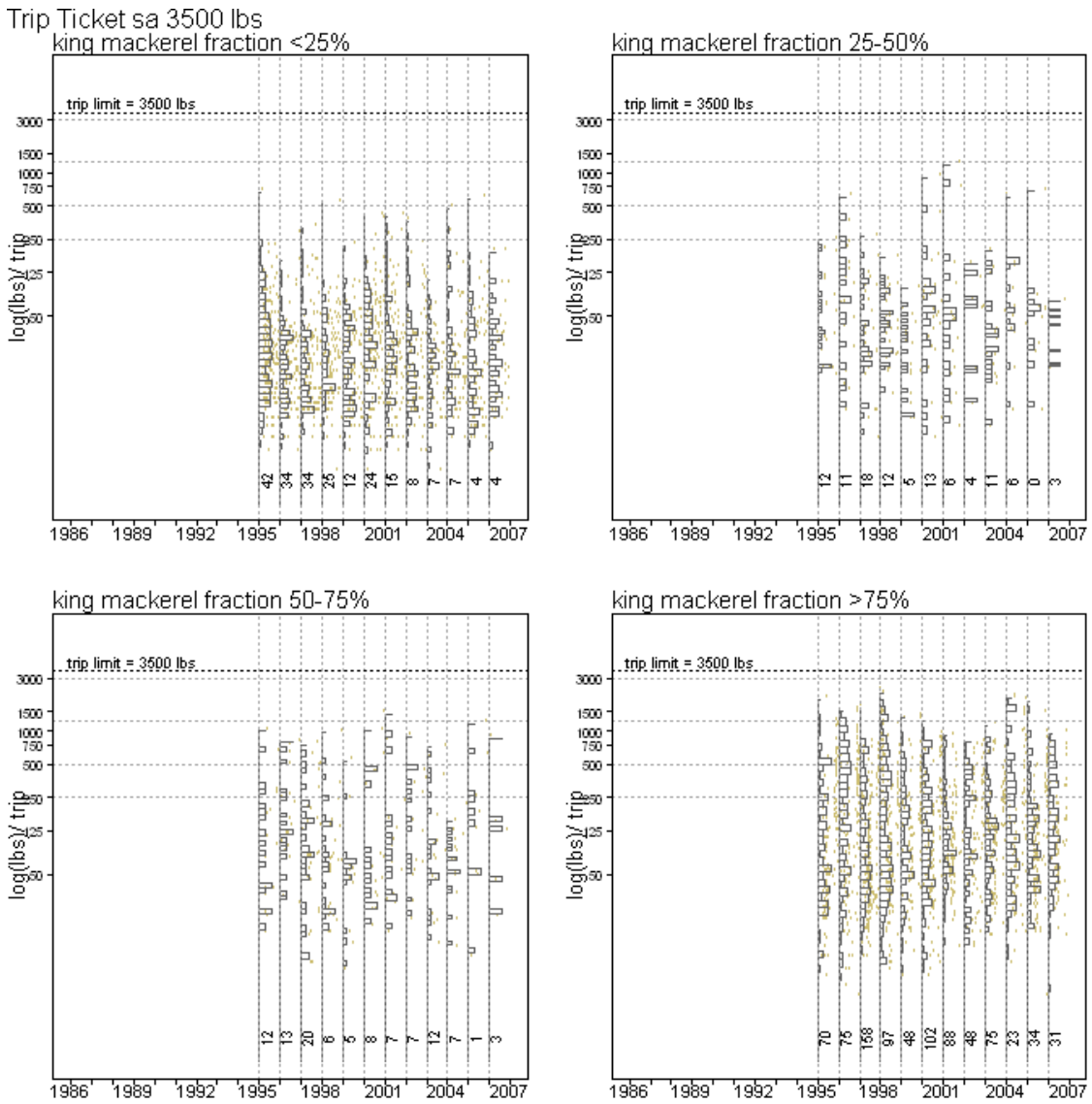


Figure 16A. Trip ticket, FECZ 25 fish trip limit.

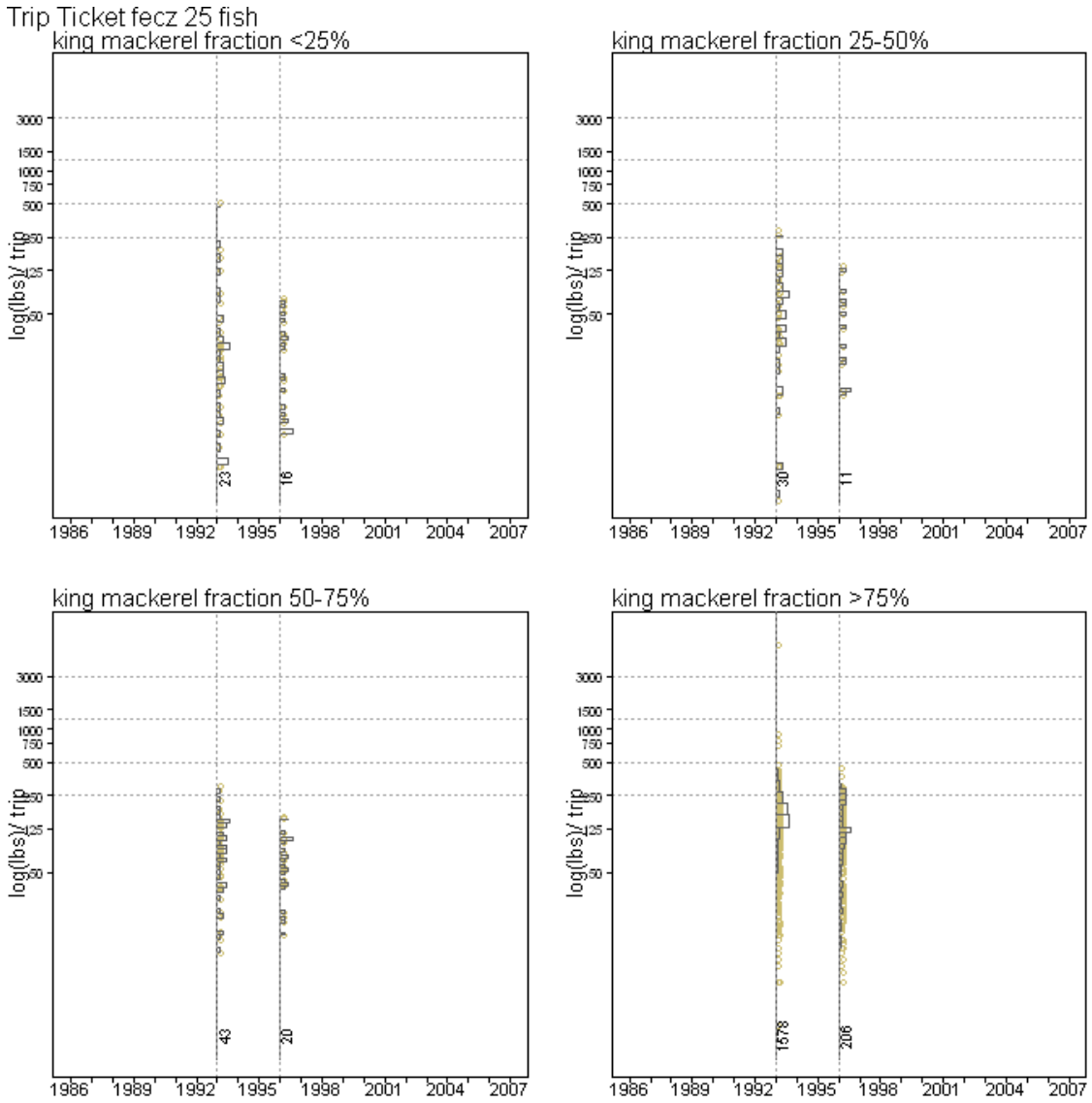
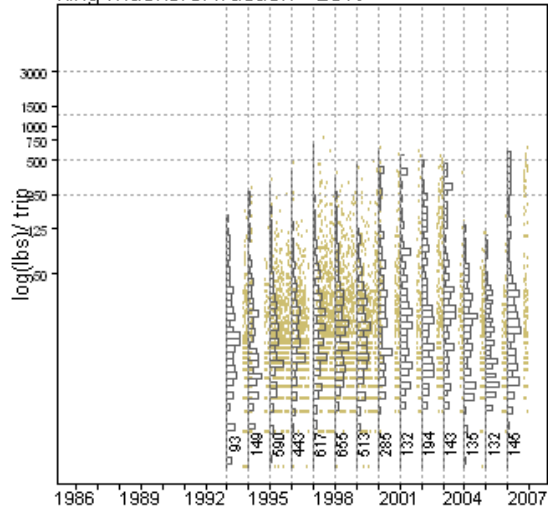
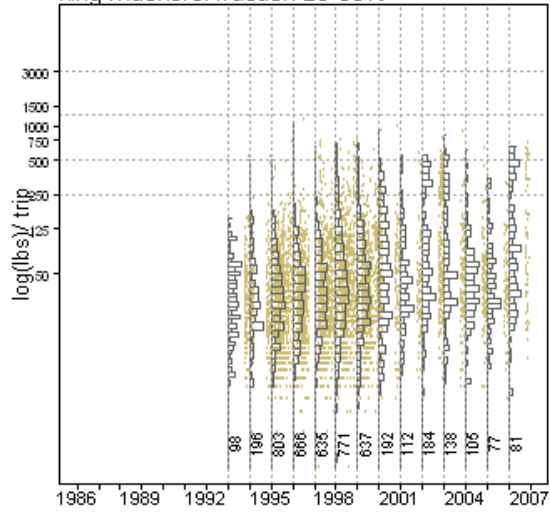


Figure 17A. Trip ticket, FECZ 50 fish trip limit.

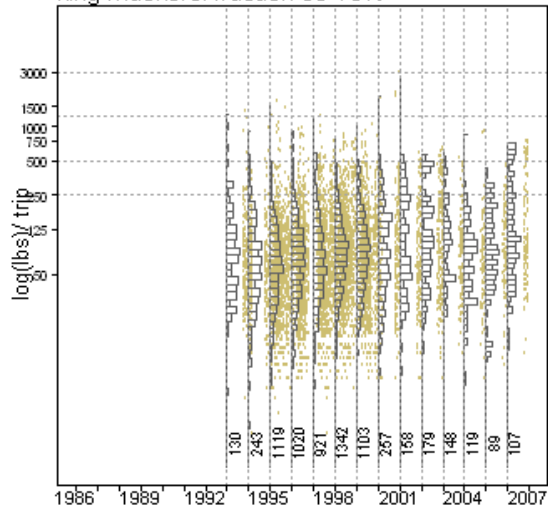
Trip Ticket fecz 50 fish
king mackerel fraction <25%



king mackerel fraction 25-50%



king mackerel fraction 50-75%



king mackerel fraction >75%

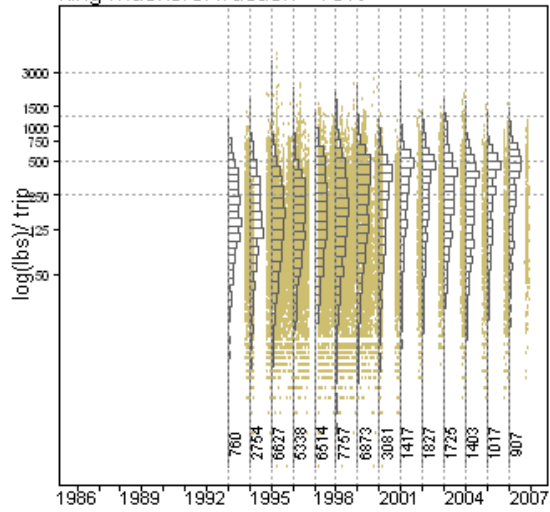
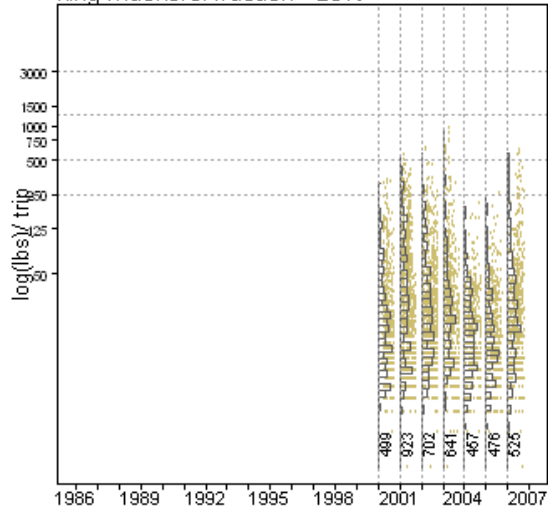
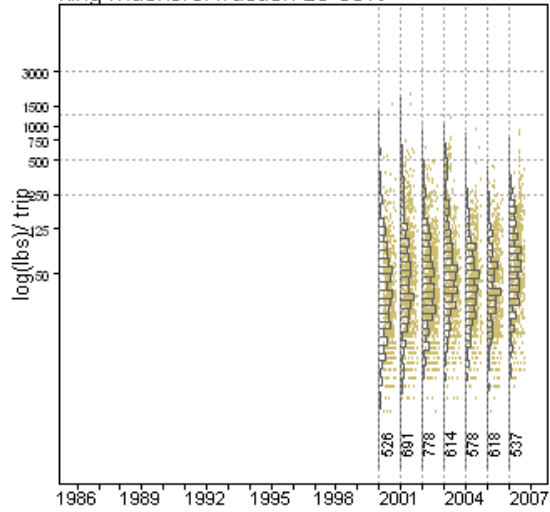


Figure 18A. Trip ticket, FECZ 75 fish trip limit.

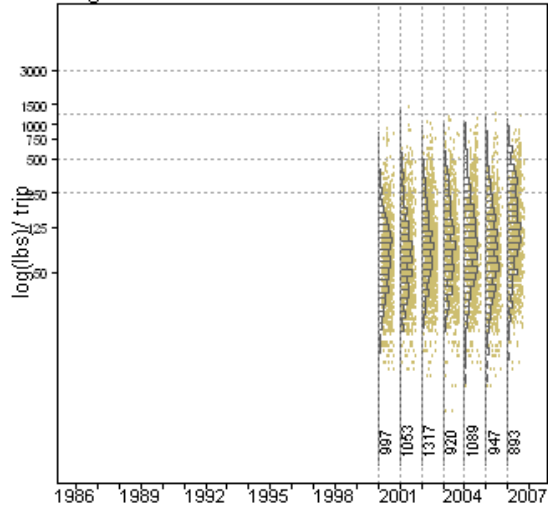
Trip Ticket fecz 75 fish
king mackerel fraction <25%



king mackerel fraction 25-50%



king mackerel fraction 50-75%



king mackerel fraction >75%

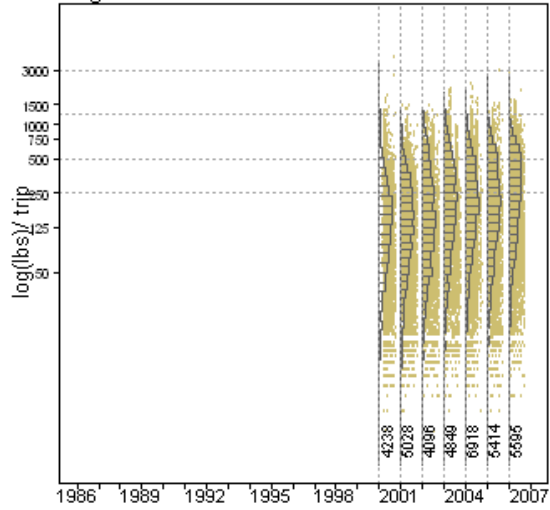


Figure 19A. Trip ticket, FECZ 500 pound trip limit.

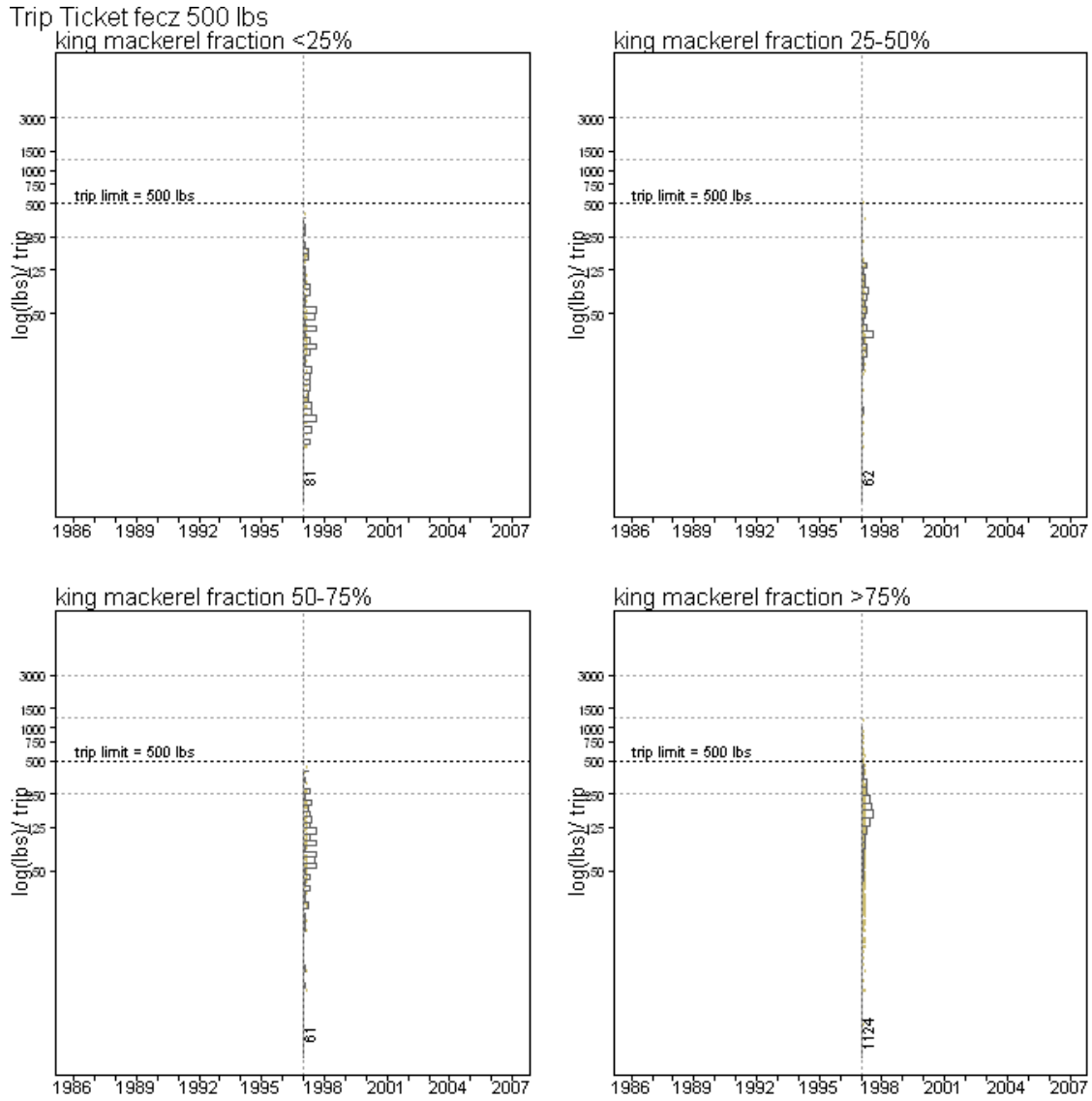


Figure 20A. Trip ticket, FECZ 750 pound trip limit.

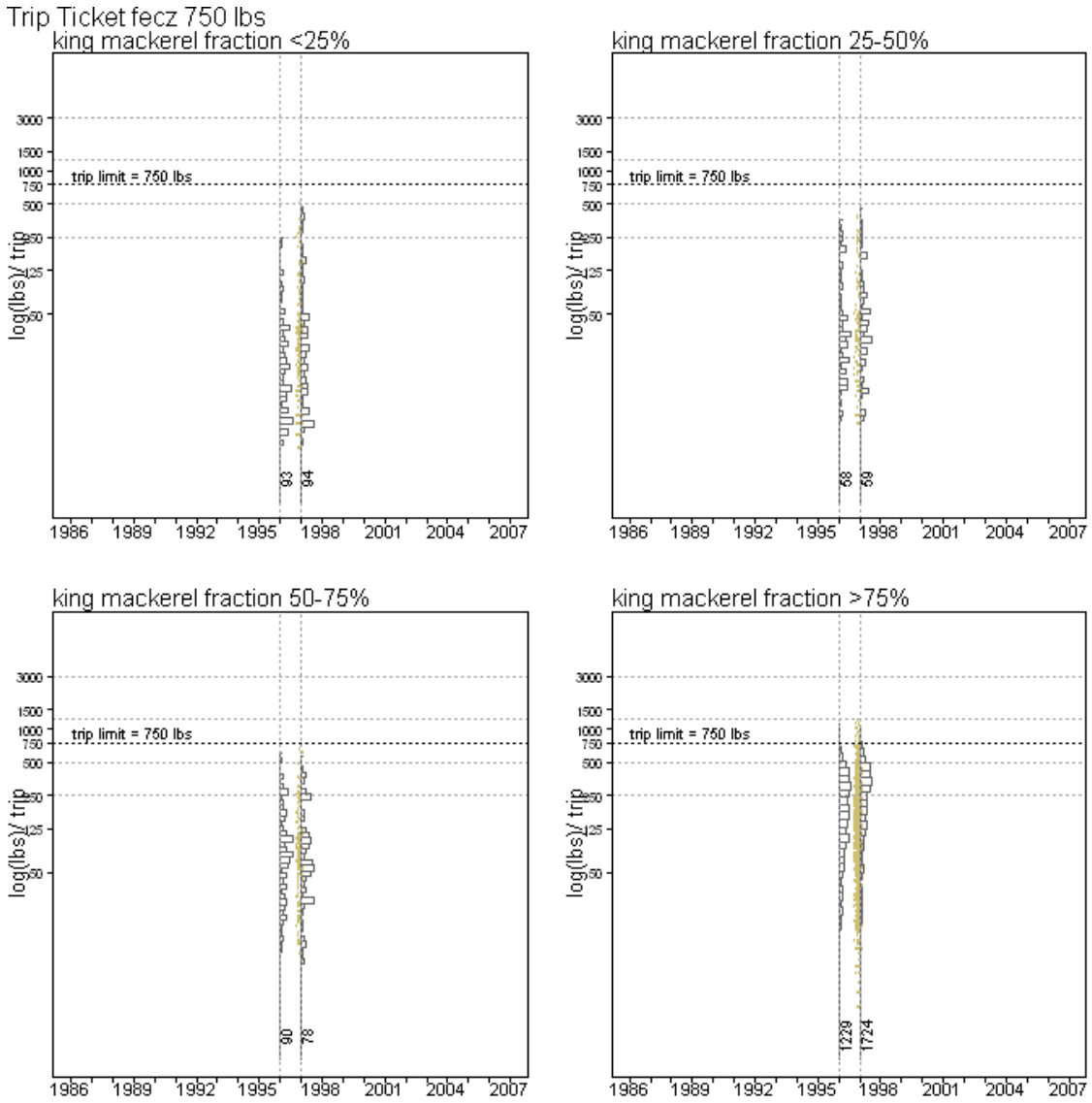


Figure 21A. Trip ticket, Keys 50 fish trip limit.

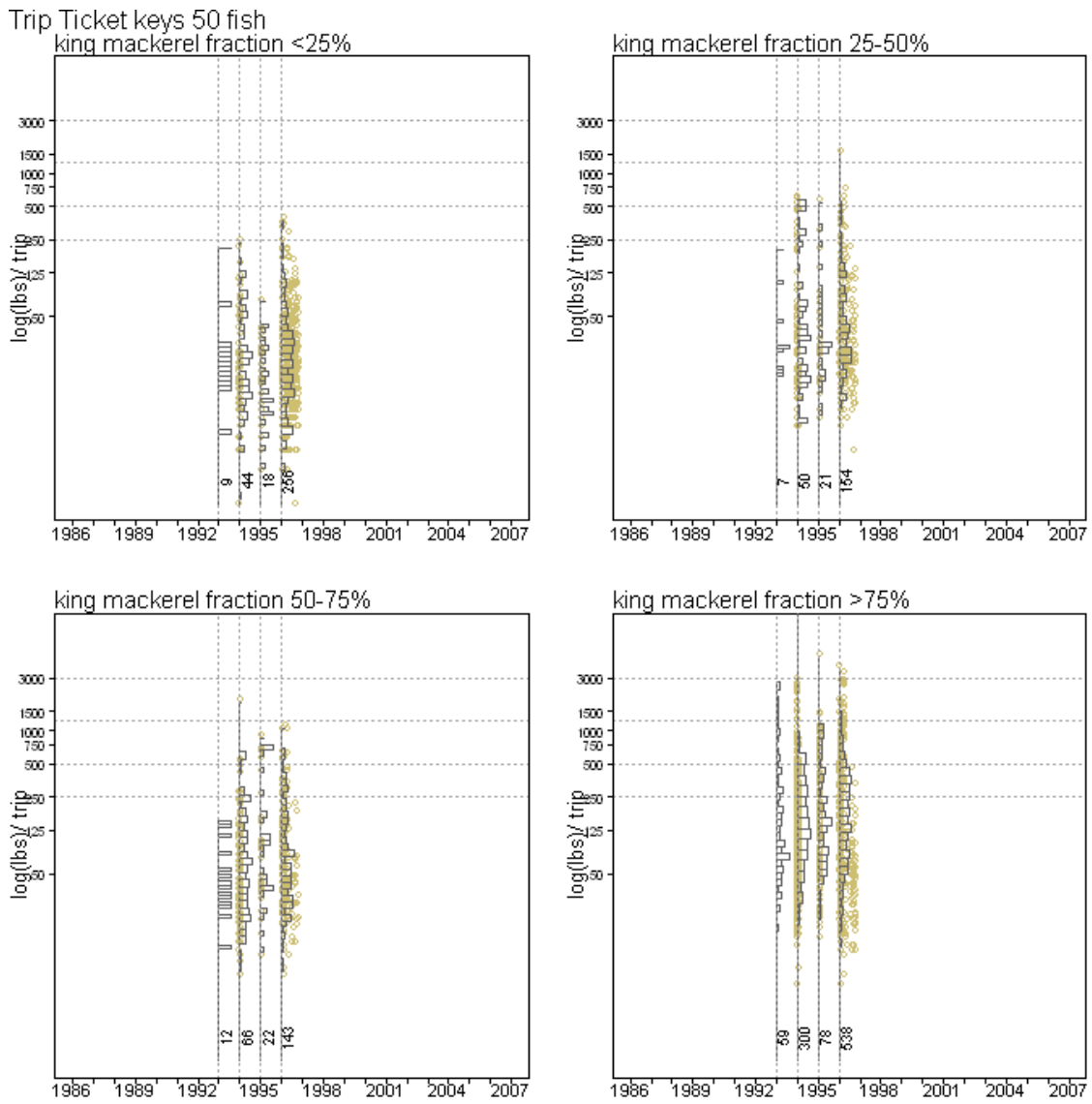


Figure 22A. Trip ticket, Keys 125 fish trip limit.

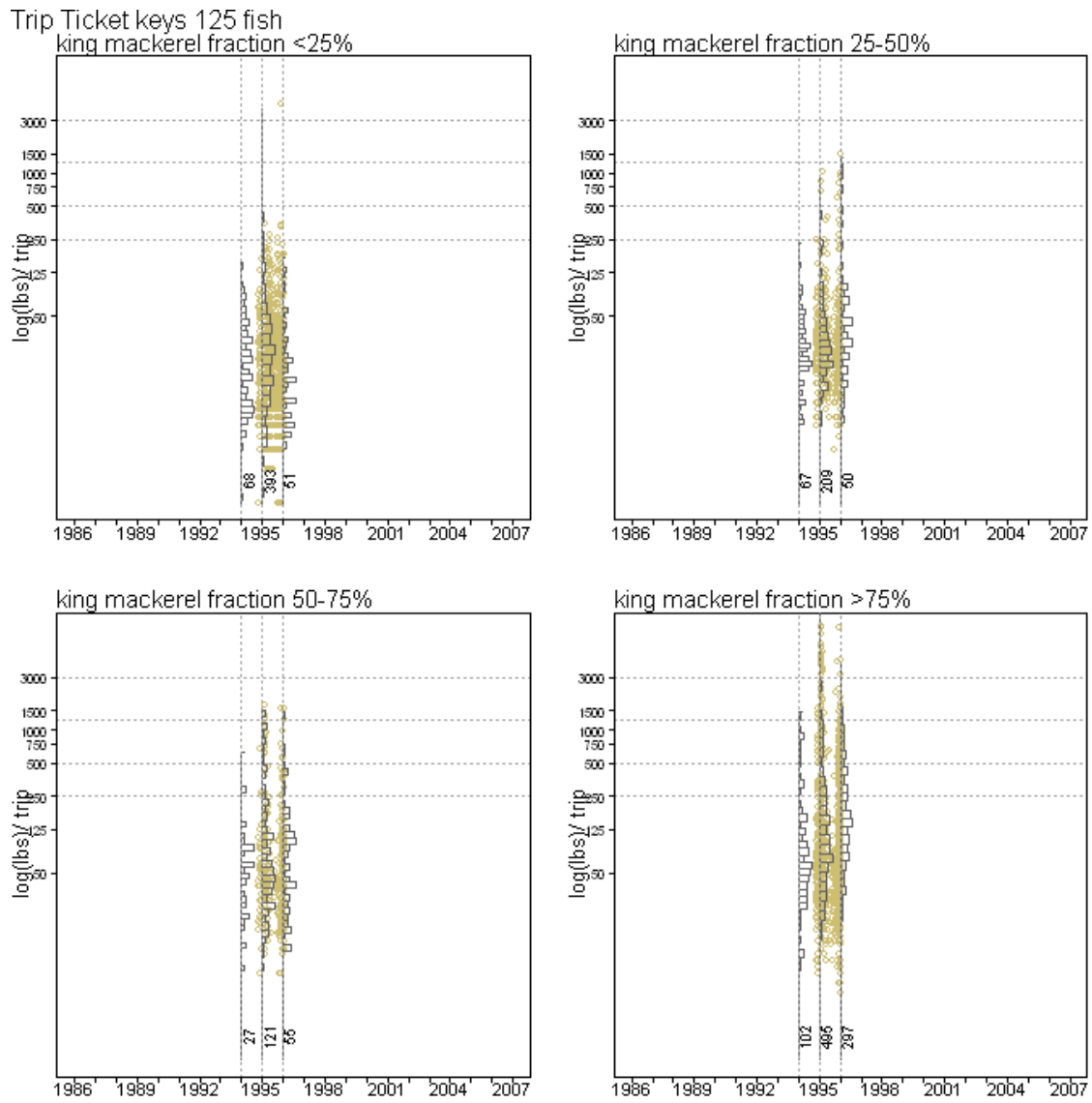
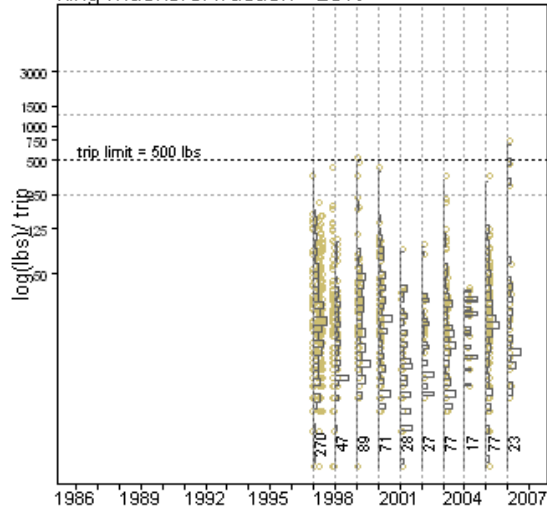
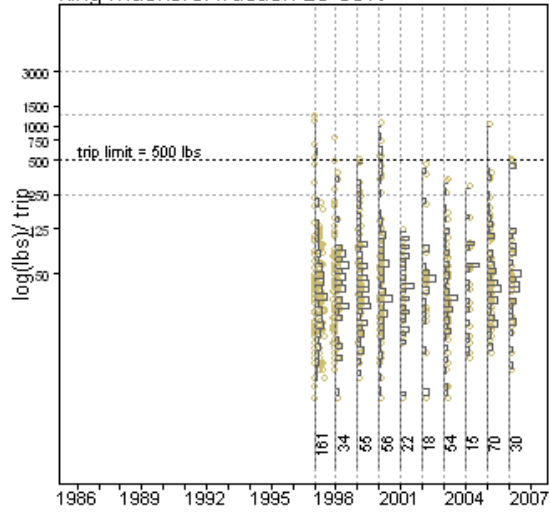


Figure 23A. Trip ticket, Keys 500 pound trip limit.

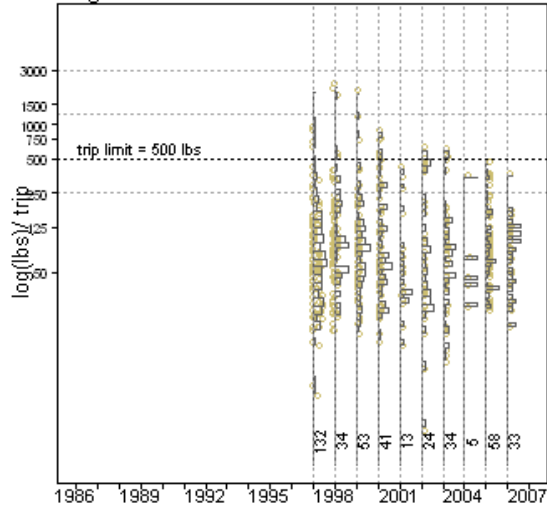
Trip Ticket keys 500 lbs
king mackerel fraction <25%



king mackerel fraction 25-50%



king mackerel fraction 50-75%



king mackerel fraction >75%

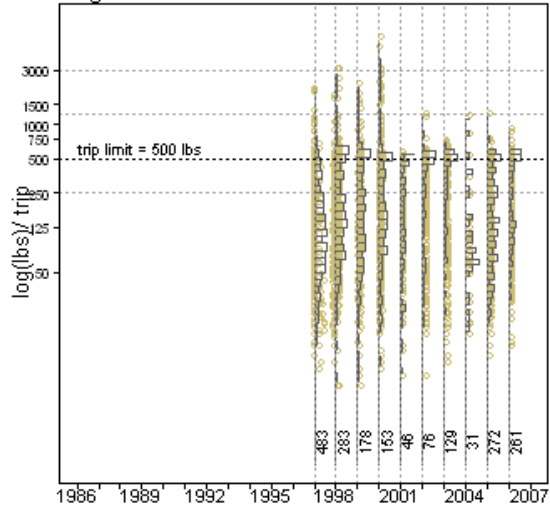
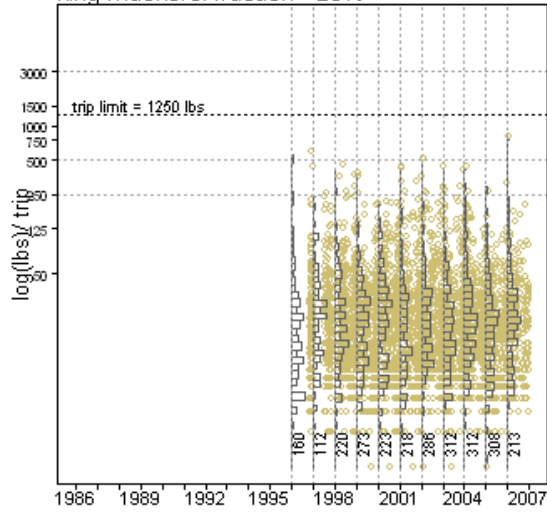
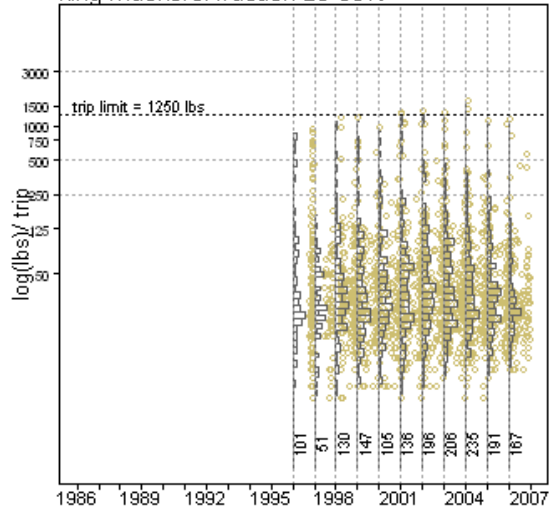


Figure 24A. Trip ticket, Keys 1,250 pound trip limit.

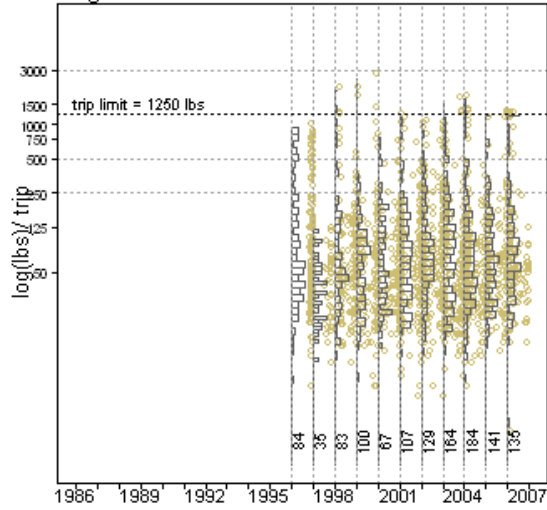
Trip Ticket keys 1250 lbs
king mackerel fraction <25%



king mackerel fraction 25-50%



king mackerel fraction 50-75%



king mackerel fraction >75%

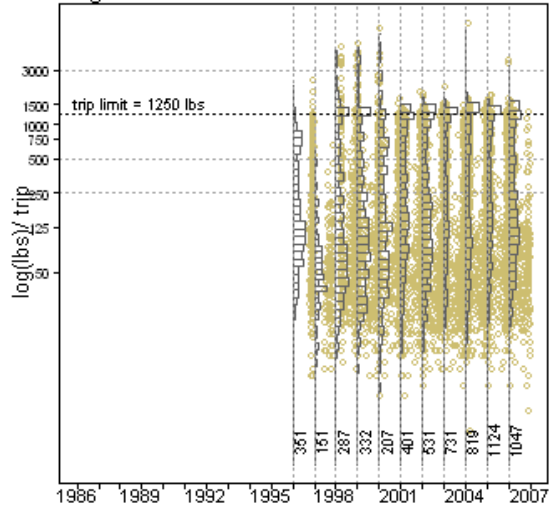


Figure 25A. Trip ticket, FLWC 125 fish trip limit.

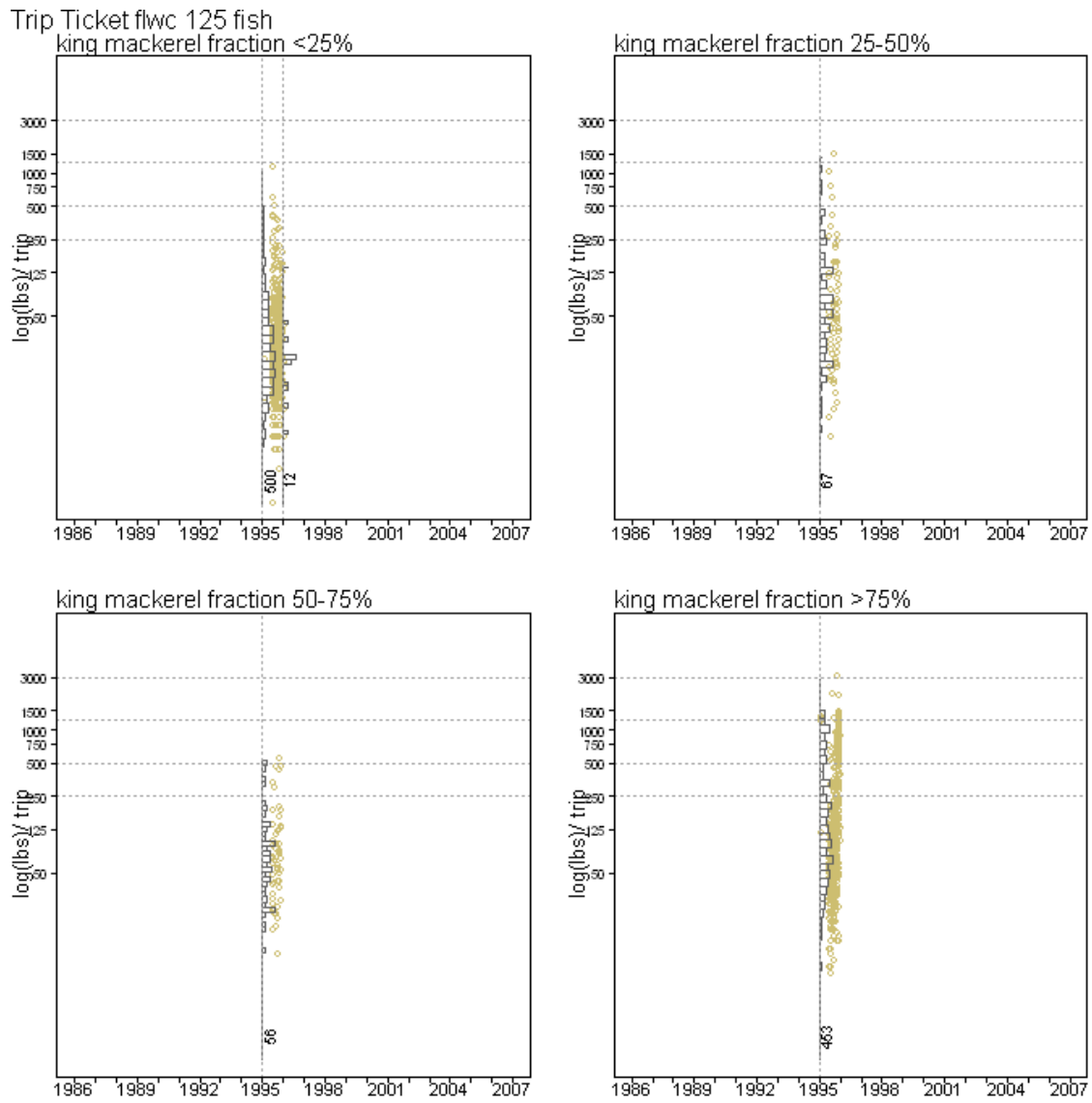
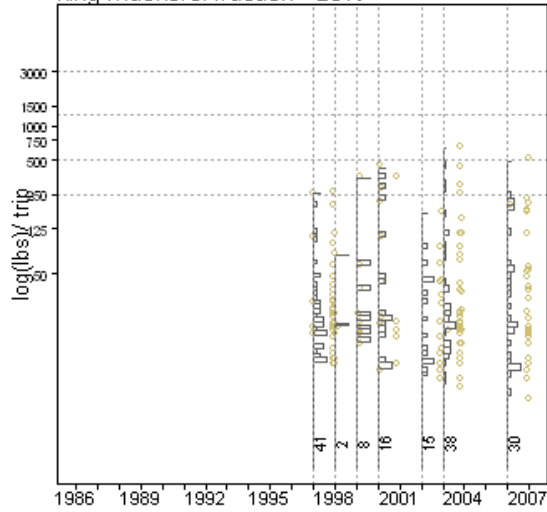
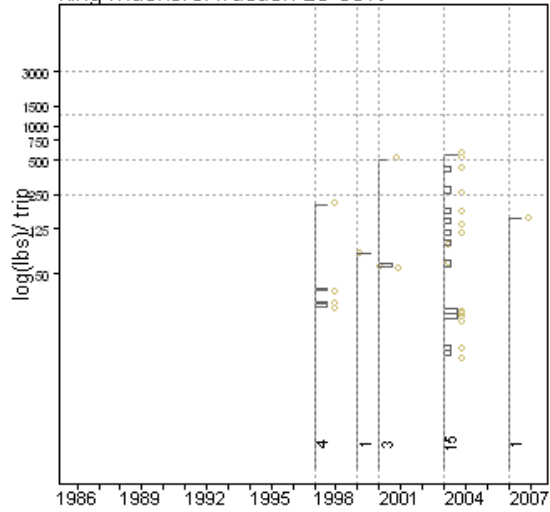


Figure 26A. Trip ticket, FLWC 500 pound trip limit.

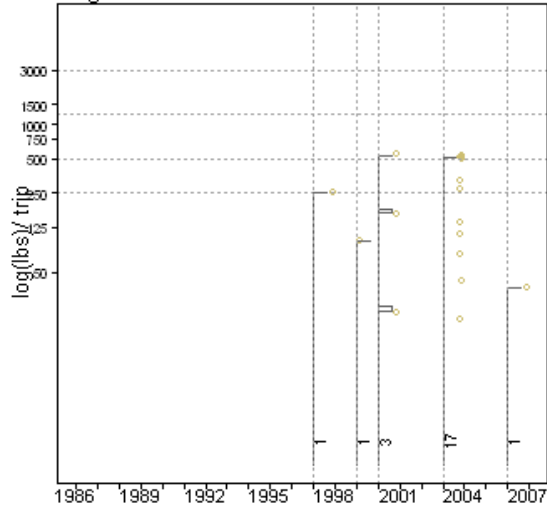
Trip Ticket flwc 500 lbs
king mackerel fraction <25%



king mackerel fraction 25-50%



king mackerel fraction 50-75%



king mackerel fraction >75%

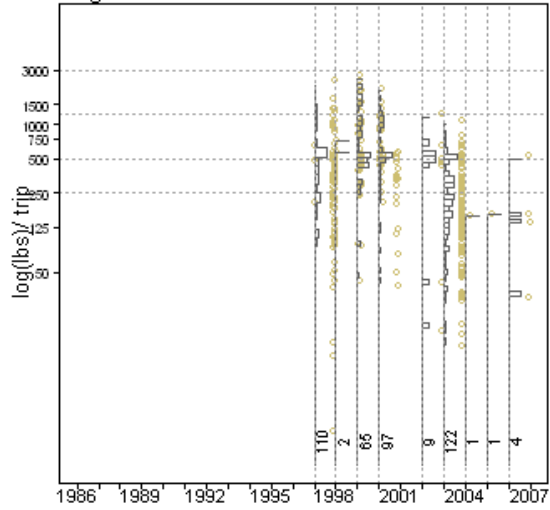


Figure 27A. Trip ticket, FLWC 1,250 pound trip limit.

