

SECRETARIAT PROCESSING OF DATA RECEIVED FROM VENEZUELA

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I. INTRODUCTION

Venezuela started its logbook system in 1983 and its port sampling scheme at Cumaná in 1985. The Secretariat assisted in establishing and improving both systems. The Secretariat has also offered to assist in processing the data until the Venezuelan Laboratory is equipped with a computer. Progress and developments have been reported in documents SCRS/86/12 and 21.

Catch and effort data for 1983 and 1984 were processed by the Secretariat in 1986 and the results were reported in "Data Record, Vol. 26". During 1987, the Secretariat has received the logbook copies for 1985 which were processed recently. The Secretariat has also started receiving biological data since late 1986, and enough data have been accumulated during 1987 to warrant data processing.

II. ORIGINAL DATA RECEIVED

1. Logbook copies

The logbooks were once entered into the computer file by the Venezuelan Statistical office and a copy of the listings was forwarded to the Secretariat. A record of the listings contains: boat registration (names are erased), departure and arrival dates at the ports, type of gears employed and daily records of effort, location (in latitude and longitude) and catches (in metric tons) by species.

2. Biological data

Most of the biological data came from Venezuela's port sampling, with a few exceptions of samples which had been taken aboard fishing vessels by scientific observers. The field sheets have been received by the Secretariat, and include associated information on the trips (dates of departure and arrival at port, gears, etc.), landing (weight) by species, location and date of catch of the fish sampled, species composition sample (generally one or two samples of 100 fish each) and size of fish by species (from 30 to 60 fish measured at fork length and occasionally at predorsal length). Sometimes, the catch in weight which samples represented was also reported.

III. DATA PROCESSING BY THE SECRETARIAT

1. Logbook copies

The logbooks have been entered mechanically by the Statistical Office in Venezuela and no biological verifications had been made prior to the processing. Also, the data have not been processed in a format convenient for the scientists. Hence, the Secretariat has verified all the data, made some modifications to the data and entered and processed them on the ICCAT computer.

Most of the modifications made were on the effort. Many logbooks have records only for those days when there were catches. Some longliners even combined weekly catches and reported once a week. Therefore, the days when there were no catches, but searching for fish took place, have to be added to the effort. Those additional days were estimated based on the locations reported for the consecutive reported days, catches and various other circumstantial evidence.

For example, if two days are missing between fishing days but the boats were in the same area, two days were added to the effort, for baitboats and purse seiners. For longliners, it is unlikely that there would be no catch for 2 consecutive days and therefore, the effort was not added. On the other hand, if five days were missing, they were added to the purse seine effort but not to the baitboat effort. Therefore, there was a general rule applied for modifications but much of the part is through experience and somewhat arbitrary.

Often, due to the deficiency of computer format, the species seem to be mixed up. For example, the Venezuelan computer format has no bigeye entries and they appear mixed with other species, sometimes as skipjack and other times as mixed species in the print-out. Those have been also corrected at the Secretariat before the data entry.

After the data were verified, they were entered into the computer file and verified through the program (e.g. flagging extreme values, excluding outside Atlantic areas, etc.). The file was then processed into the ICCAT Task II catch and effort format by gears ($1^{\circ} \times 1^{\circ}$ area and month). All the foreign flag vessels were combined and processed separately from the national boats.

The mixed species catch records were prorated by the species composition of reported catches for each time-area strata. In cases where the composition is not available for that particular stratum, the mean of the month for the entire area was used.

2. Biological data

After the data were verified through scanning by eyes, they were entered into a computer file. The file is then verified again by program (flagging extreme value, outside zones, etc.) and processed. The processing was done in two different ways:

Without corrections of species composition

The size data were raised immediately to the reported catch of the corresponding species from which the samples were made. Then they were arithmetically added by area ($5^{\circ} \times 5^{\circ}$) and time (months) of catches.

With modification by species composition sampling

The total catch of all species combined from which samples came were redistributed into the species according to the species composition of the sample(s). The size data were then raised to this corrected catch by species. The frequencies were then combined into the same time-area strata mentioned above.

3. Parameters used

Most of the measurements are of fork length. However, there are some measurements made at predorsal length (LDL). Since there is no conversion from LDL to the fork length available for the west Atlantic, the conversion table developed for the eastern tropical Atlantic was applied.

In order to estimate the sample weights, the following length-weight equations were used for each species:

$$\text{WEIGHT (Kg)} = A * \text{FL (cm)}^B \quad \text{where}$$

Yellowfin tuna	A=.00002153	B=2.976	Caveriviere, 1976
Skipjack	A=.00000748	B=3.2526	Cayre et Laloe, 1983
Bigeye tuna	A=.00002396	B=2.9774	Parks et al, 1981
Albacore	A=.000006303	B=3.2825	Beardsley, 1971
Frigate tuna	A=.00000166	B=3.64257	SCRS/85/55
Blackfin tuna	A=.0000181	B=3.02838	Richards, 1970

IV. RESULTS

1. Logbook copies

The processed data will be published in the forthcoming "Data Record, Vol. 28" and detailed data will be available on request in hard copy or on magnetic tape. The results were used to estimate Task I catches together with other information such as the total Venezuelan catch (combining Atlantic and Pacific together) and Venezuelan Pacific catches, etc.

2. Size data

The sample size (number of fish), the weight of catches sampled and the number of fish estimated for the sampled catches are given in Table 1, by gears and by quarters. They are given for reported catches and for catches modified using species composition sampling. Almost all the catches were made in only two neighboring $5^{\circ} \times 5^{\circ}$ areas (41060 and 41065); they are combined together in this Table.

Those are then summarized in Table 2 for a year, and species compositions for them are given. Unfortunately, since Task I or II catches were available only for 1985, they are compared only for purse seine 1985. When 1986 data are received, they should be compared with these samples and the sampled catches in Table 2, with respect to species composition and sampling rate.

V. DISCUSSION

1. Logbook data.

There have been some improvements in logbook records in 1985 over previous years. The major changes are:

- The longline format now has spaces to record bigeye catches; therefore, the reporting of that species is more complete.
- Probably due to clearer instructions given by the Venezuelan Government, more captains reported on the days even when no catches were made. Therefore, the accuracy on effort has been increasing.
- In early 1987, a recommendation was made that the logbook for longline should be further improved to include the catches of all tuna and tuna-like fish (including billfishes) by species. A form was also developed. If this is implemented, there would be further important improvement.

2. Sampling

a. Sampling rate

In 1985, sampling started in June but was discontinued in the fourth quarter and was not resumed until almost the second quarter of 1986. Therefore, sampling in 1985 is almost nil. Some more data for latter half of 1986 are expected to be received at the Secretariat. Therefore, it is a bit premature to discuss the sampling level. However, it is obvious that the sampling level is still very low.

From Table 2, it is known that only 2915 fish were measured for the surface fleet. The total catch of the surface fleet would probably have been close to 50,000 metric tons. Therefore, only about 6 fish per 100 metric tons have been measured. In particular, the sampling rate was low for purse seiners.

In 1986, about 1700 MT of the purse seine catch was sampled and about 1000 fish were measured, i.e., 58 fish per 100 MT. For baitboats, about 1900 fish per 460 MT, i.e., 413 fish per 100 MT, were sampled. Therefore, the size of a sample seems adequate, except for large purse seiners (over 200 MT capacity).

However, the total Venezuelan tuna catches are on the order of 50 to 60 thousand tons. Therefore, only less than 5% of the entire catch was sampled and that is too low to get any meaningful results. Increasing the sampling coverage is essential.

b. Species composition

The reported sampled catches (at the time of landing) by samplers and the results of the species composition sampling are quite consistent throughout the sampling, even though the sampling is not adequate to make any conclusive comments. Particularly, in the fourth quarter of 1986, size composition sampling has not been made in May sampling and therefore the data are lacking for comparison.

As Task I data are not available for 1986, it is difficult to evaluate the species composition reported in Task I from the species sampling results. It seems, however, that there are gaps between the two, since the Task I catch would probably show over 60% of yellowfin while the reported sampled catch, as well as this limited species composition samples, show less percentage of yellowfin.

On the other hand, Task I data would show about 2-5% of bigeye catch, while port sampling recorded no bigeye for 1986. This may indicate either that Task I or port sampling or both contain errors, but at the same time the sampling level is still too low to contribute significantly to such analysis.

VI. RECOMMENDATIONS

Logbooks

1. The longline logbook should be modified as recommended in 1987, including all the species of tuna and billfishes.
2. At the same time, the computer format (data entry as well as print-out) should be changed to accept such modifications in the logbooks.
3. Very strict instructions should be given to the fishermen to record all fishing activities, including searching, for all the days when the boats are at sea. Baitboats observe this better but the large purse seiners have not been observing this rule.
4. When the logbook records are entered into the computer file at the Venezuelan Statistics and Information Office, those days without catches should not be skipped.
5. Longliners (particularly large ones with Korean crews) should not report catches combined by week but report on daily basis.
6. Shipping of logbook copies should be made by air rather than by surface mail since they take about eight months to reach Madrid via surface mail.

Port sampling

1. Sampling should be much more intensified from the level of 1986. In particular, frequencies of the sampling should be increased. In other words, many more landings should be sampled at the port.
2. All the landings of large seiners at Cumaná should be sampled.
3. Two or three samples should be taken from different wells of large seiners (over 200 MT capacity).

4. Attention should be given to the recommendations on sampling made by the Working Group on Juvenile Tropical Tunas Statistics.
5. If predorsal length are taken on any occasion, it should not be mixed up with fork length. A conversion between pre-dorsal length to fork length should be developed for the west Atlantic and Caribbean Sea.
6. If possible, sampling should be established at the foreign ports (Panama?) to sample from the purse seiners landing there, through international collaboration.

TABLE 1. NUMBER OF FISH SAMPLED, REPORTED CATCH SAMPLED AND REPORTED CATCH MODIFIED BY SPECIES COMPOSITION SAMPLING; BY GEAR AND BY QUARTERS.

	YFT	SKJ	BET	ALB	BLF	FRI	TOTAL
PURSE SEINE 1985							
QUARTER 1 SAMPLE SIZE (#)	0	0	0		0	0	0
REPORTED TOTAL (MT)							
REPORTED TOTAL (#)							
MODIFIED TOTAL (MT)							
MODIFIED TOTAL (#)							
QUARTER 2 SAMPLE SIZE (#)	403	250	8		54	24	739
REPORTED TOTAL (MT)	1234	667	15		54	73	2043
REPORTED TOTAL (#)	178507	331061	1412		10830	73	521810
MODIFIED TOTAL (MT)	1677	731	16		77	73	2574
MODIFIED TOTAL (#)	206096	366250	1508		13162		587016
QUARTER 3 SAMPLE SIZE (#)	153	100	0		6	3	262
REPORTED TOTAL (MT)	568	396			8	5	977
REPORTED TOTAL (#)	32088	164832			2523		199443
MODIFIED TOTAL (MT)	372	595			4	4	975
MODIFIED TOTAL (#)	22563	254122			1147		277832
QUARTER 4 SAMPLE SIZE (#)	0	0	0		0	0	0
REPORTED TOTAL (MT)							
REPORTED TOTAL (#)							
MODIFIED TOTAL (MT)							
MODIFIED TOTAL (#)							
SEINE 1986							
QUARTER 1 SAMPLE SIZE (#)	0	50					50
REPORTED TOTAL (MT)		124					124
REPORTED TOTAL (#)		83948					83948
MODIFIED TOTAL (MT)		124					124
MODIFIED TOTAL (#)		83948					83948
QUARTER 2 SAMPLE SIZE (#)	200	250					450
REPORTED TOTAL (MT)	270	419					689
REPORTED TOTAL (#)	38443	156601					195044
MODIFIED TOTAL (MT)	265	402					667
MODIFIED TOTAL (#)	37077	148840					185917
QUARTER 3 SAMPLE SIZE (#)	200	99					299
REPORTED TOTAL (MT)	324	104					428
REPORTED TOTAL (#)	31065	39145					70210
MODIFIED TOTAL (MT)	324	104					428
MODIFIED TOTAL (#)	31065	39145					70210
QUARTER 4 SAMPLE SIZE (#)	100	100					200
REPORTED TOTAL (MT)	350	181					531
REPORTED TOTAL (#)	32013	85466					117479
MODIFIED TOTAL (MT)	350	181					531
MODIFIED TOTAL (#)	32013	85466					117479

Table 1. (Cont'd)

	YFT	SKJ	BET	ALB	BLF	FRI	TOTAL
BAITBOAT 1986							
QUARTER 1 SAMPLE SIZE (#)	100	298		0			398
REPORTED TOTAL (MT)	57	160					217
REPORTED TOTAL (#)	6944	65259					72203
MODIFIED TOTAL (MT)	41	147					188
MODIFIED TOTAL (#)	6048	57646					63694
QUARTER 2 SAMPLE SIZE (#)	100	150		50			300
REPORTED TOTAL (MT)	19	37		3			59
REPORTED TOTAL (#)	5125	13938		199			19262
MODIFIED TOTAL (MT)	19	27		3			49
MODIFIED TOTAL (#)	5125	9959		199			15283
QUARTER 3 SAMPLE SIZE (#)	424	150		0			574
REPORTED TOTAL (MT)	51	20					71
REPORTED TOTAL (#)	8512	12159					20671
MODIFIED TOTAL (MT)	51	20					71
MODIFIED TOTAL (#)	8512	12159					20671
QUARTER 4 SAMPLE SIZE (#)	396	248		0			644
REPORTED TOTAL (MT)	88	66					154
REPORTED TOTAL (#)	9249	24781					34030
MODIFIED TOTAL (MT)	88	66					154
MODIFIED TOTAL (#)	9249	24781					34030
LONGLINE 1986							
QUARTER 1 SAMPLE SIZE (#)	50						50
REPORTED TOTAL (MT)	11						11
REPORTED TOTAL (#)	245						245
MODIFIED TOTAL (MT)	10						10
MODIFIED TOTAL (#)	209						209
QUARTER 2 SAMPLE SIZE (#)	78						78
REPORTED TOTAL (MT)	15						15
REPORTED TOTAL (#)	338						338
MODIFIED TOTAL (MT)	15						15
MODIFIED TOTAL (#)	338						338
QUARTER 3 SAMPLE SIZE (#)	0						0
REPORTED TOTAL (MT)							
REPORTED TOTAL (#)							
MODIFIED TOTAL (MT)							
MODIFIED TOTAL (#)							
QUARTER 4 SAMPLE SIZE (#)	0						0
REPORTED TOTAL (MT)							
REPORTED TOTAL (#)							
MODIFIED TOTAL (MT)							
MODIFIED TOTAL (#)							

TABLE 2. REPORTED SAMPLED CATCH, SAMPLED CATCH MODIFIED BY SPECIES SAMPLINGS,
TASK I CATCH (ONLY 1985 AVAILABLE) AND THEIR SPECIES COMPOSITIONS.

	YFT	SKJ	BET	ALB	BLF	FRI	TOTAL
PURSE SEINE 1985							
SAMPLE SIZE (#)	556	350	8		30	27	971
REPORTED TOTAL (MT)	1802	1063	15		63	78	3021
MODIFIED TOTAL (MT)	2048	1326	16		81	77	3548
TASK I CATCH (MT)	13597	7485	508	59	0	0	21649
REP.TOT.SP.COMP. (%)	59.65	35.19	0.50	0.00	2.09	2.58	100
MOD.TOT.SP.COMP. (%)	57.72	37.37	0.45	0.00	2.28	2.17	100
TASKI CATCH COMP.(%)	62.81	34.57	2.35	0.27	0.00	0.00	100
PURSE SEINE 1986							
SAMPLE SIZE (#)	500	499					999
REPORTED TOTAL (MT)	945	828					1773
MODIFIED TOTAL (MT)	939	811					1750
REP.TOT.SP.COMP. (%)	53.30	46.70	0.00	0.00	0.00	0.00	100
MOD.TOT.SP.COMP. (%)	53.66	46.34	0.00	0.00	0.00	0.00	100
AIBOAT 1986							
SAMPLE SIZE (#)	1020	846		50			1916
REPORTED TOTAL (MT)	215	283		3			501
MODIFIED TOTAL (MT)	199	259					458
REP.TOT.SP.COMP. (%)	42.91	56.49	0.00	0.60	0.00	0.00	100
MOD.TOT.SP.COMP. (%)	43.45	56.55	0.00	0.00	0.00	0.00	100
VGLINE 1986							
SAMPLE SIZE (#)	128						128
REPORTED TOTAL (MT)	27						27
MODIFIED TOTAL (MT)	25						25
REP.TOT.SP.COMP. (%)	100.00						100
MOD.TOT.SP.COMP. (%)	100.00						100