

UPDATED STANDARDIZED CPUE FOR ALBACORE CAUGHT BY JAPANESE LONGLINE FISHERY IN THE SOUTH ATLANTIC OCEAN, 1959-1996

Uosaki, K.¹

Uosaki (1996) presented albacore abundance indices in the north and south Atlantic Ocean for 1959-1995, though the data for 1995 was preliminary. The purpose of this paper is to update the CPUE trend by Uosaki (1996) using data sets for 1959-1996 in the south Atlantic.

In this paper, calculation of standardizing CPUE was made for the period 1975-1996 in the south stock. The data and the method of standardizing CPUE is the same of Uosaki (1996), except that the data for 1995 was completed in compiling and the minor revision of the data for 1994 was made and that the preliminary 1996 was included. The models used is;

(CPUE Model: log normal error structure assumption)

$$\ln(\text{CPUE}+0.1) = \mu + Y + Q + A + G + Y*Q + Q*A + Q*G + A*G$$

(Catch Model: Poisson error structure assumption)

$$E(C) = H \cdot \exp(\mu + Y + Q + A + G + Y*Q + Q*A + Q*G + A*G)$$

which were selected as final model in Uosaki (1996).

The ANOVA for the CPUE Model and goodness of fit for the Catch Model for the data sets for the period 1975-1996 are shown in Tables 1 and 2, respectively. The distribution of the standardized residuals of the CPUE Model for the data sets for the period 1975-1996 is shown in Fig. 1. The distribution of the standardized residuals appear roughly normal. The scaled CPUEs which were adjusted to 1.0 in 1975, for 1959-1996 are shown in Table 3 and for 1975-1996 is in Fig. 2. The CPUE in 1994 and 1995 were slightly lower than that in the result of Uosaki (1996).

Reference

Uosaki K. 1996. Updated standardized CPUE for Albacore Caught by Japanese longliner in the Atlantic ocean, 1959-1995. SCRS/96/71. Working paper of 1996 ICCAT Albacore Stock Assessment Session.

Table 1. ANOVA for the CPUE Model for the period 1975-96 in the south Atlantic.

Source	DF	SS	Mean Sq.	F Value	Pr > F
Model	155	8866.56	57.20	49.02	0.0001
Error	15229	17772.80	1.17		
Corr. Tot.	15384	26639.37			

R-sq.= 0.333 C.V.= -77.91

Source	DF	Type III SS	Mean Sq.	F Value	Pr > F
Y	21	560.62	26.70	22.88	0.0001
Q	3	67.31	22.44	19.23	0.0001
A	8	2336.08	292.01	250.21	0.0001
G	3	16.95	5.65	4.84	0.0023
Y*Q	63	470.61	7.47	6.4	0.0001
Q*A	24	1118.78	46.62	39.94	0.0001
A*G	24	501.02	20.88	17.89	0.0001
Q*G	9	134.87	14.99	12.84	0.0001

Table 2. Goodness of fit for the Catch Model for the period 1975-96 in the south Atlantic.

Source	NDF	DDF	F	Pr>F	ChiSquare	Pr>Chi
Y	21	15245	39.22	0.0001	823.62	0.0001
Q	3	15245	19.63	0.0001	58.90	0.0001
A	8	15245	148.20	0.0001	1185.56	0.0001
G	3	15245	0.69	0.5610	2.06	0.5610
Y*Q	63	15245	23.93	0.0001	1507.39	0.0001
Q*A	24	15245	66.60	0.0001	1598.44	0.0001
Q*G	9	15245	5.81	0.0001	52.25	0.0001
A*G	24	15245	20.97	0.0001	503.36	0.0001

¹ National Research Institute of Far Seas Fisheries, 7-1 Orido 5 chome, Shimizu-shi, 424 Japan.

Table 3. Scaled CPUEs with the 95 % confidence limits for the CPUE Model and scaled CPUEs for Catch Model in the south Atlantic. The value of CPUE was adjusted to 1.0 in 1975. CPUEs for 1959-74 is derived from Uosaki (1996).

Year	CPUE Model			Catch Model
	Mean	Lower 95%	Upper 96%	
59	18.778	15.656	22.499	51.391
60	14.948	12.548	17.785	44.006
61	11.377	9.954	12.991	30.737
62	9.593	8.454	10.875	23.218
63	8.564	7.558	9.695	19.580
64	9.092	8.082	10.218	21.378
65	6.179	5.568	6.851	17.313
66	6.514	5.817	7.287	16.990
67	6.928	6.057	7.912	16.239
68	5.942	5.192	6.788	16.162
69	3.054	2.629	3.534	7.107
70	1.888	1.613	2.200	4.807
71	2.273	1.943	2.648	6.207
72	1.793	1.498	2.132	3.377
73	1.096	0.878	1.349	1.674
74	1.367	1.016	1.801	1.749
75	1.000	0.785	1.259	1.000
76	1.083	0.804	1.433	1.313
77	0.940	0.730	1.194	0.683
78	1.139	0.900	1.427	0.428
79	0.730	0.587	0.897	0.294
80	0.927	0.794	1.077	0.840
81	1.465	1.264	1.692	1.395
82	1.245	1.084	1.427	1.484
83	0.911	0.734	1.119	0.867
84	0.917	0.785	1.065	0.881
85	1.439	1.265	1.633	1.355
86	1.231	1.063	1.419	1.539
87	0.799	0.668	0.948	0.631
88	0.565	0.486	0.653	0.463
89	0.746	0.655	0.845	0.656
90	0.719	0.633	0.812	0.571
91	0.777	0.684	0.878	0.672
92	0.654	0.567	0.749	0.687
93	0.627	0.546	0.715	0.588
94	0.679	0.603	0.761	0.596
95	0.492	0.431	0.558	0.442
96	0.525	0.458	0.598	0.571

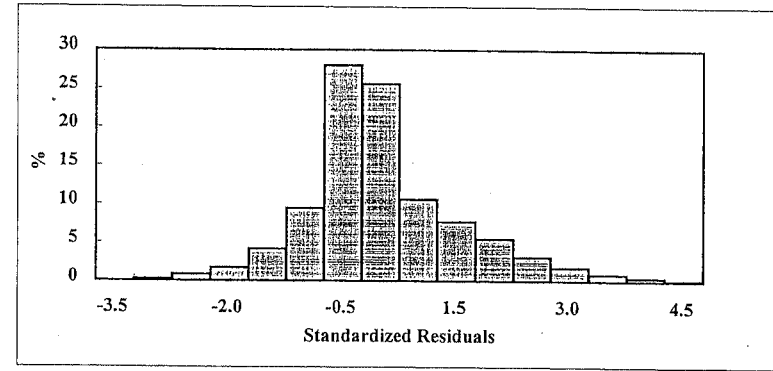


Figure 1 The distribution of standardized residual of the CPUE Model.

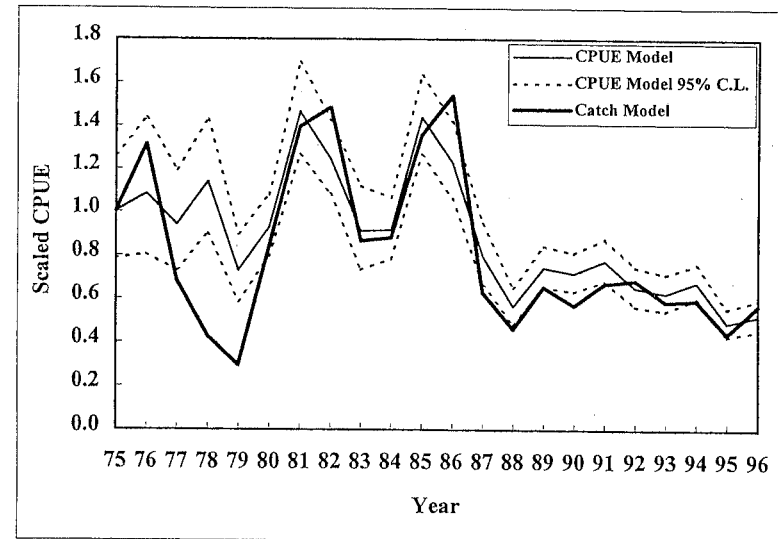


Figure 2 Scaled standardized CPUEs of south Atlantic albacore using two different model. The value of CPUEs was adjusted to 1.0 in 1975.