

AN UNUSUAL BLUEFIN TUNA TAG RETURN

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SUMMARY

A tagged bluefin tuna was recaptured in 1981 after almost 16 years at large. Size-at-release data suggest this bluefin was 2-years-old at the time of release, thereby extending the documentable age of bluefin tuna to 18-years-old. The estimated fork length at recapture of 257 cm. was used to examine the fit of the von Bertalanffy growth equation parameter estimates in the literature.

RESUME

Un thon rouge porteur de marque depuis près de 16 ans a été repris en 1981. Les données de marquage indiquent qu'il s'agissait alors d'un poisson de 2 ans, ce qui porte à 18 ans l'âge maximum de cette espèce pour lequel des preuves sont disponibles. La longueur fourche estimée à la recapture, 257 cm, a servi à étudier le degré d'ajustement des estimations de paramètres par l'équation de croissance de von Bertalanffy qui figurent dans les études antérieures.

RESUMEN

Se recapturó un atún rojo en 1981, después de casi 16 años en libertad. Los datos de marcado disponibles sobre su talla en el momento de ser liberado, sugieren que el pez fue marcado a la edad de 2 años, aproximadamente, lo cual probaría que el atún rojo alcanza los 18 años de vida. Se examinó la idoneidad de la ecuación de crecimiento de von Bertalanffy, utilizando las estimaciones de longitud a la horquilla (257 cm.) en el momento de su recaptura.

Numerous attempts have been made to mathematically describe the growth patterns of bluefin tuna in the Atlantic Ocean. These have now reached the stage where validation techniques would provide the most significant advances. One such technique is the long-term recapture of a tagged bluefin for which size-at-release and size-at-recapture data and a suitable ageing structure have been obtained.

A tagged bluefin was recaptured on May 28, 1981 using sport gear off Cat Cay, Bahama Islands (25°29'N, 79°16'W) after almost 16 yr at large. A round weight of 223.6 kg was measured and a fork length of 257 cm was estimated from a photograph taken by the angler. The thirty-sixth vertebra was retained and provided by the angler for possible use in age validation. The sex of the fish was not identified.

This bluefin was originally tagged and released on August 5, 1965 from a Canadian purse seiner fishing 33 miles southeast of Sandy Hook, New Jersey, U.S.A. (39°59'N, 73°25'W). Thirty-eight bluefin were single-tagged with FT1A tags (plastic dart with single barb attached to yellow spaghetti tubing) and released during that set. All were recorded to have had a fork length of 80 cm and to weigh approximately 11 kg. No other size data are available. This length and weight suggest these bluefin were 2-yr-old at the time of release, based upon size-at-age data reported by Mather and Schuck (1960), and Sakagawa and Coan (1974). Of the thirty-eight bluefin released from that set, six were recaptured during the following 2 yr (Table 1). The size-at-recapture data of all but one agree with the release age estimate of 2-yr-old. Only an approximate recapture weight was reported for this exception.

The available size-at-release data suggest that the age-at-release of this bluefin was 2-yr-old and therefore that the age-at-recapture was 18-yr-old. While this recapture extends the documentable age of bluefin tuna to 18-yr-old, the data from this recapture are also useful in evaluating growth models calculated for bluefin tuna. Many sets of parameter estimates for the von Bertalanffy growth equation for bluefin tuna are in the literature, representing a wide range of collection sites, ageing techniques and size ranges. Using these various values, age estimates ranging from 11.9- to 21.1-yr-old were calculated for this specimen (Table 2). Although no model can be validated based upon this data, only

three sets of parameter estimates produced age estimates for this bluefin of 18 yr or greater, those of Butler et al. (1977), Parrack and Phares (1979), and Hurley et al. (1981). It is noteworthy that only these three analyses used data sets including fish aged 18 yr or greater, indicating the necessity of using a data set extending over the entire life history to accurately describe the growth pattern.

Analysis of a structure used in ageing studies would be much more meaningful in evaluating ageing techniques. An analysis of the vertebra collected from this bluefin is presently being conducted in co-operation with personnel at the Miami Laboratory where vertebrae have been used extensively in the past to assign ages to bluefin.

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TABLE 1. Recapture data for bluefin tuna tagged and released on 5/08/65 at 39°59'N, 73°25'W.

Tag #	Date	Weight (kg)	Fork length (cm)	Lat.	Long.
01171	28/05/81	223.6	(257)	25°29'N	79°16'W
01172	27/08/67	34.4	125	39°53'N	73°42'W
01178	16/08/67	34.9	116	40°07'N	73°42'W
01272	06/09/65	13.2	-	40°23'N	73°43'W
01275	12/12/65	-	87	40°27'N	73°31'W
01276	15/07/67	~13.6*	-	off Cape May, N.J., U.S.A.	
01278	22/06/66	-	104	39°56'N	73°39'W

*Weight estimated "approximately 30 pounds"

TABLE 2. Age estimates of a 257 cm fork length bluefin tuna from parameter estimates of the von Bertalanffy growth model.

Source	L_{∞}	K	t_0	Age estimate (yr)
Rodriguez-Roda (1971)	356	0.09	-0.89	13.3
Sakagawa and Coan (1974)				
from Mather and Schuck	437	0.06	-1.49	13.3
from Mather and Jones	447	0.05	-1.59	15.5
Butler et al. (1977)				
males	287	0.13	-0.33	17.1
females	277	0.12	-0.80	21.1
Bard et al. (1978)	318	0.11	-0.62	14.1
Parrack and Phares (1979)	313	0.09	-0.96	18.2
Compean-Jimenez and Bard (1980)	370	0.07	-1.58	15.4
Farrugio (1980)	351	0.08	-1.09	15.4
Farber and Lee (1981)				
from mark-recapture data	313	0.12	-0.14	14.2
from vertebrae data	401	0.08	-0.92	11.9
Hurley et al. (1981)				
males	281	0.15	0.05	16.5
females	271	0.14	-0.21	21.0