

**STATISTICS FROM THE SPANISH ALBACORE (*THUNNUS ALALUNGA*)
SURFACE FISHERY IN THE NORTH EASTERN ATLANTIC,
YEARS: 2012 AND 2013**

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SUMMARY

The main features of the Spanish albacore (Thunnus alalunga) surface fishery in 2012 and 2013 are presented. Fishing is conducted during summer and autumn seasons operating in offshore waters of the northeast Atlantic and Bay of Biscay. The catch of the bait boat fleet has oscillated between and increase of 42% in 2012, with respect to 2011 yield and a decreased of 45% in 2013 compare to 2012 yield. On the other hand the troll fleet increased the catch in 2012 about 64% and remained at the same level in 2013, in comparison to the 2011 troll yield. The bait boat fleet targeted albacore from July to October, mainly in the Bay of Biscay area, while albacore was targeted by the troll fleet from June to November, in the Bay of Biscay also but largely in off shore waters of North east Atlantic fishing grounds. Size composition of catches obtained by the bait boats in 2012, showed a high proportion of age 1 group, followed by a high proportion of age 2 group in 2013. The age structure in the troll fleet showed a high proportion of age 1 group in 2012 catch followed by the remarkable high proportion of age 2 in the 2013 catch. The demography structure, with a high proportion of ages 1 and 2 groups could be an indicator of an abundant albacore cohort in 2011, that was available to the Spanish surface fishery in 2012 and 2013. Monthly spatial distribution of nominal catch rates by fleet are presented for 2012 and 2013 fishing seasons.

RÉSUMÉ

Les principales caractéristiques de la pêcherie espagnole de surface de germon (Thunnus alalunga) en 2012 et 2013 sont présentées. La pêche a lieu pendant les mois d'été et d'automne dans les eaux situées au large de l'Atlantique Nord-Est et du golfe de Gascogne. La prise de la flottille de canneurs a oscillé entre une augmentation de 42% en 2012 par rapport à la production de 2011 et une diminution de 45% en 2013 par rapport à la production de 2012. D'autre part, la flottille de ligneurs a accru ses captures en 2012 d'environ 64% et est demeurée au même niveau en 2013 par rapport à la production des ligneurs de 2011. La flottille de canneurs cible le germon de juillet à octobre, essentiellement dans le golfe de Gascogne, tandis que le germon a été ciblé par la flottille de ligneurs de juin à novembre dans le golfe de Gascogne également, mais majoritairement dans les eaux au large des zones de pêche de l'Atlantique Nord-Est. La composition des tailles des captures obtenues par les canneurs en 2012 a fait apparaître une forte proportion du groupe d'âge 1, suivie d'une forte proportion du groupe d'âge 2 en 2013. La structure démographique de la flottille de ligneurs a fait apparaître une forte proportion du groupe d'âge 1 dans la capture de 2012, suivie d'une proportion remarquablement élevée du groupe d'âge 2 dans la prise de 2013. La structure démographique, dotée d'une proportion élevée des groupes d'âge 1 et 2, pourrait être un indicateur de la cohorte abondante de germons en 2011, qui était disponible pour la pêcherie de surface espagnole en 2012 et 2013. La distribution spatiale mensuelle des taux de capture nominale par flottille est présentée pour les saisons de pêche 2012 et 2013.

RESUMEN

Se presenta un resumen de la actividad pesquera de las flotas españolas de cebo vivo y cacea dirigidas a la pesca de atún blanco (Thunnus alalunga) en los meses de verano y otoño de 2012 y 2013 en aguas del Atlántico nordeste y golfo de Vizcaya. La captura de los barcos de cebo vivo osciló entre un aumento del 42 % en 2012 en comparación al año 2011 y un descenso del 45% en 2013, respecto al año 2012. La captura de flota de cacea, aumentó un 64 % en 2012 y

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mantuvo el mismo nivel de captura en 2013, en relación al año 2011. La flota de cebo vivo operó de julio a octubre en el Golfo de Vizcaya, mientras que a flota de cacea opero principalmente en las aguas del Atlántico nordeste, de junio a noviembre. La composición de tallas de la captura de cebo vivo, mostró que la captura en número de edad 1 en 2012 fue la más abundante, y la edad 2, representó la captura mayor en 2013. La misma estructura edades se observo en la flota de cacea en 2012 y 2013. La composición de edades de la captura, podría ser un indicador de una cohorte abundante de atún blanco en 2011. La distribución geográfica mensual de las tasas de captura nominal de ambas flotas se presenta para 2012 y 2013.

KEYWORDS

Thunnus alalunga, Troll fishery, Baitboat fishery, Catch, Size composition, Age composition, Northeast Atlantic, Bay of Biscay, Albacore

1. Introduction

Albacore (*Thunnus alalunga*) has been targeted by the Spanish surface fleet, with baitboat and troll vessels for decades in the North eastern Atlantic and Bay of Biscay offshore waters (Arrizabalaga *et al.*, 2010, Ortiz de Zárate and Barreiro, 2010). The albacore fishery represents an important resource from the socio-economical activity reported in the north-western and northern fishing ports. In spring and early summer, as the water temperature rises, immature albacore migrates from the central Atlantic waters towards the north-eastern Atlantic and Bay of Biscay temperate surface waters, (Aloncle et Delaporte, 1973; Bard, 1981; Ortiz de Zárate and Cort, 1998; Arrizabalaga, 2003) where forage prey are abundant (Pusineri *et al.*, 2005). The annual migratory behaviour of juvenile albacore drives the marked seasonality and area of this fishery that take place during summer and autumn months in the northern coast of Iberian Peninsula (Bard and Santiago, 1999).

Concerning the activity of both fleets: alive bait boat (BB) and trolling (TR), no major changes were observed during 2012 and 2013 fishing season in relation to fishing characteristics. The number of boats involved varies among years; the annual averaged number is 450 vessels (80% troll and 20% bait boat). The troll vessels are of lesser tonnage (mean of 50 GRT) than those of bait boat (mean 120 GRT). The catch composition by age is mainly made up of immature albacore 1 to 4 age groups, corresponding to 50 to 90 cm fork length fish.

The aim of this paper is to present an overall description of the characteristics of the Spanish albacore surface fishery in 2012 and 2013. The main statistics collected from the monitoring of the fishery, represented by catch-at-size composition of landings and the demographic structure of catches obtained by length slicing method are presented for both fleets. Moreover, a brief description of the evolution of fishing grounds based on the geographical distribution of the nominal catch in weight (kg) per unit of effort (in fishing days) is presented for both fleets.

2. Material and Methods

The monitoring of the Spanish bait boat and troll fleets activity in 2012 and 2013 was done by means of collecting information through interviews to skippers at main fishing ports located along North western coast and the Cantabrian coast. The information, based on individual trip samples by fleet, that was collected included: number of days at sea, number of fishing days, catch in number of fish and weight (kg) and an approximate location of catch by 1°x1° degrees latitude and longitude, recording at least one position per trip.

Smaller number of trips was also sampled to obtain the length frequency of the catch by applying random sampling stratified according to commercial categories of catches landed in the main fishing markets which were monitored. The following information was recorded: date of landing, gear, number of days at sea, number of fishing days, number of lines, approximation of the fishing area in 1° x 1° degree, catch in number, catch in weight (kg) and fish length (cm). Fish were measured to the fork length (FL) and to the nearest centimetre according to commercial categories in the fishing markets.

The catch, nominal effort expressed in fishing days and length frequency data were processed by gear on monthly basis following raising procedures to estimate the Task I and Task II (biological information) statistics of ICCAT (ICCAT, 2006-2010). Thus, the monthly distribution of catch at length was estimated for the landed catches of troll and bait boat fleets in 2012 and 2013.

The collected information of catches in weight and fishing effort by trip was aggregated by 1° x 1° latitude and longitude for each month and gear fleet. Then monthly nominal catch rates (CPUE) of both fleets were estimated according to the geographical locations in 1°x1° degrees and represented to describe the spatial evolution of fleets in 2012 and 2013 fishing seasons. Likewise, the monthly percentage of catch in weight by gear was calculated to describe the temporal evolution of catches according to the fishing activity in 2012 and 2013. Median seasonal pattern of catch for the estimated period 2007-2011 was included for comparison to most recent temporal pattern.

Total age composition of catches by fleet was derived by using the mean length at age obtained for North Atlantic albacore stock based on the von Bertalanffy model estimated by Bard (1981), then the values obtained for the quarter 3 (July, August and September) (see **Table 2** in Arrizabalaga and Santiago, 2003) were used to split the catch at length distribution by applying a knife-edge deterministic slicing to calculate the number of fish by age group caught in 2012 and 2013.

3. Results and Discussion

According to the information collected and processed, the total albacore nominal catch (Task I data) obtained by the surface fleets in 2012 of 12,015 t represented an increase in comparison to 2011 fishing season, although it showed a decrease in the following year 2013, with 9,289 t being caught. The estimated nominal catch rates for the bait boat fleet by month in 2012 and 2013 fishing seasons are represented in **Figure 1a** and **Figure 1b**, respectively. As shown, most of the catches were obtained in the Bay of Biscay area. Likewise the estimated nominal catch rates for troll fleet by month 2012 and 2013 fishing seasons are included in **Figure 2a** and **Figure 2b**. The troll fleet operated mainly in the offshore waters of the North eastern Atlantic from June to September. Only partially in September and during October the activity of this fleet took place in the Bay of Biscay area. The geographical distribution of bait boat catches in the last two years has been reduced and concentrated mainly in the Bay of Biscay area closer to the coast line. On the other hand, in 2012 and 2013 years, the monthly spatial distribution of troll vessels interviewed shown a presence of the albacore resource, in offshore Atlantic waters at early fishing season beginning in June until the end of summer season in September, when some troll trips showed a distribution in the Bay of Biscay that continued in October. Similar troll fleet behaviour was observed in 2011 fishing season (Ortiz de Zárate *et al.*, 2013).

The overall nominal catch in 2012 amounted to 12,015 t, an increase of near 52% compared to the 2011 catch (Ortiz de Zárate *et al.*, 2013). As for the 2013 fishing season, it was registered a total catch of 9,289 t, that represented a decrease of 23% in comparison to 2012 catch, but higher than the 7,910 t caught in 2011, the lowest catch on record for last 10 years period.

The temporal evolution by month of the nominal catches, Task I, taken in 2012 fishing season by the bait boat fleet is shown in **Figure 3a**. Similarly, monthly evolution of the troll fleet Task I catches is shown in **Figure 3b**. In 2012, the bait boat fleet completed 90% of the total catch between July and September, with a peak in August, while in 2013, July registered a peak of catch, above the median for the period 2007 -2011, nevertheless the 90 % of total catch was obtained from July to September. In the case of the troll fleet, the fishing season in 2012 was more balanced, spreading the catch from July to October, meanwhile year 2013, showed a clear peak in July, followed by August and September in decreasing trend, being closer to the median trend estimated for the period 2007-2011.

In 2012, the length distribution of catch was obtained from a sample size of 53,894 fish measured, representing a sampling coverage in number of fish of 1.4 % for bait boat and 3.5 % for troll fleets respectively. The total seasonal catch at size distribution (Task II data) is shown in **Figure 4a** for the bait boat and troll fleets operating in 2012. Likewise, in **Figure 4b** is shown the catch at size distribution obtained for bait boat and the troll fleets during 2013. Three main modes can be clearly identified in the length distribution of catches taken by troll vessels by visual inspection in 2012 and 2013. Meanwhile, in the case of the bait boat catch at size distribution it is also possible to identify some modes, but not as clearly. The total catch at size distribution by fleet and year shown some distinct profile that corresponds to the different selectivity patterns associated to the two gears targeting albacore in different spatial and temporal strata.

The age composition of catch for the bait boat and troll fleets obtained by length slicing of the catch at size, ranged from age 1 to age 4 group in 2012 and 2013 catches. However, the age composition varied in the proportion at age obtained annually by the two fleets accordingly to the diverse catchability as shown in **Figure 4c** and **Figure 4d**. The estimated proportions of age 1 was large in both bait boat and troll vessels (48%) in 2012.

However in 2013, only the bait boat shown a high proportion of age 1 albacore (33%) as compared to the troll proportion (13 %). In the case of age 2 group, the proportion was estimated at the same level for both fleets in 2012, nevertheless in 2013, some difference was present between the 45 % percentage in bait boat against the higher value of 68% in troll fleet. The presence of age 3 in the bait boat catch, was similar in 2012 and 2013 (19-20%) and slightly higher in respect to the troll catch of age 3, whose percentage of 12 and 16 % in the catch composition respectively, was slightly lower. The age 4 group, very scarce in the composition of catch, represented the 2% of total albacore caught by the bait boat and troll fleet in the two consecutive years. The abundance of age 1 represented by a percentage of 48% (**Figure 4c**) in the commercial catch taken by the surface fleets in 2012, that continued in 2013 with a high percentage of 60% for age 2 group albacore (**Figure 4d**) in the catch, could be considered as an indicator of a strong albacore cohort in 2011 being recruited to the surface fishery in the North Atlantic stock.

The inter annual changes observed in the surface fishery concerning the temporal and spatial distribution of albacore targeted by the surface fishery in the last two years described, merit to be studied in relation to factors such the availability of prey to forage, the habitat utilization by immature albacore (Pusineri *et al.*, 2005; Goñi *et al.*, 2009) along with knowledge of climatic and oceanographic conditions in the northeast Atlantic waters and Bay of Biscay off shore waters. All these related variables impacting the migratory behaviour of albacore (Dufour *et al.*, 2010) require further research and comprehensive studies.

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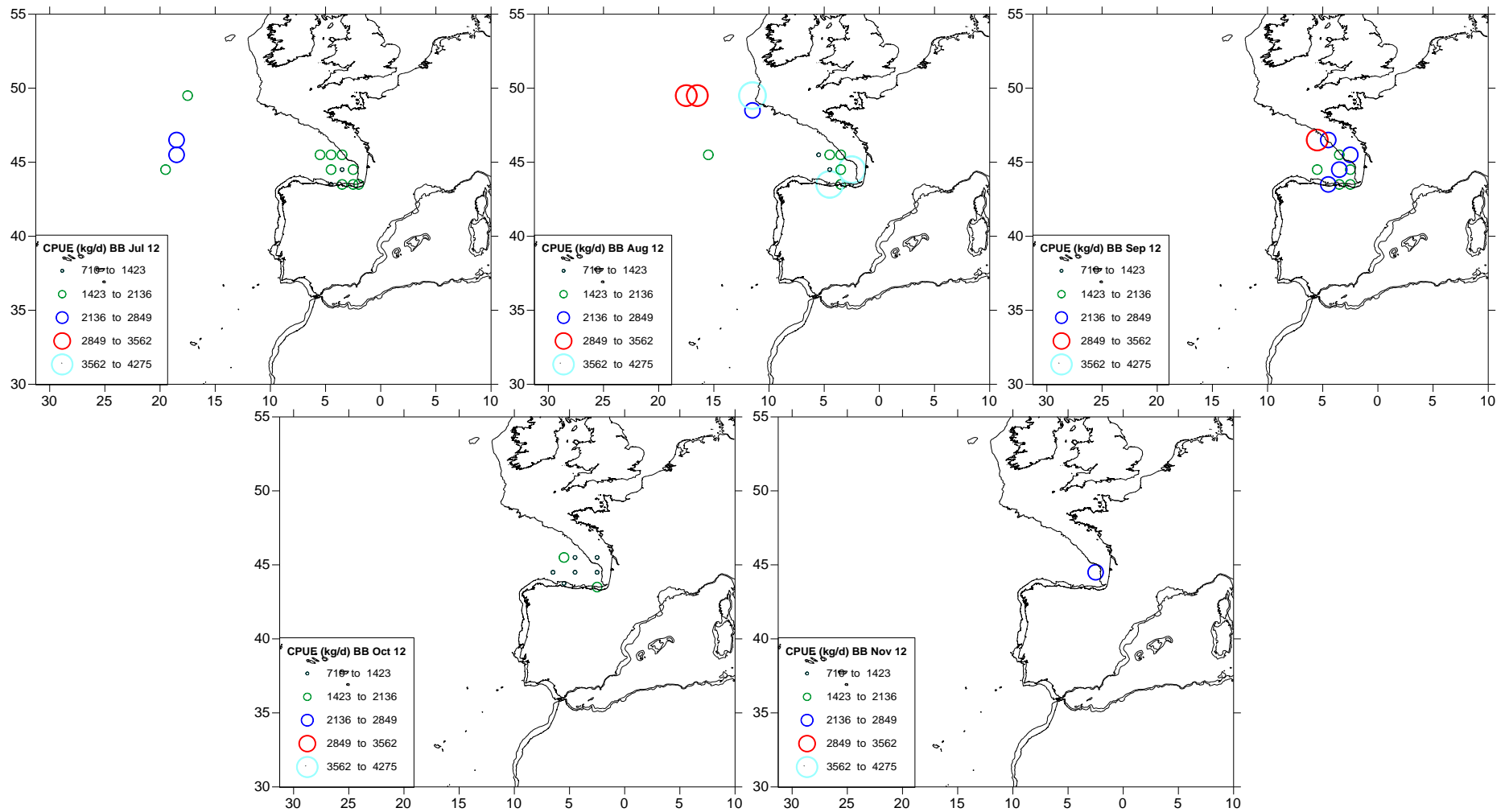


Figure 1a. Spanish bait boat nominal CPUE distribution in 2012 fishing season derived from interviews to skippers.

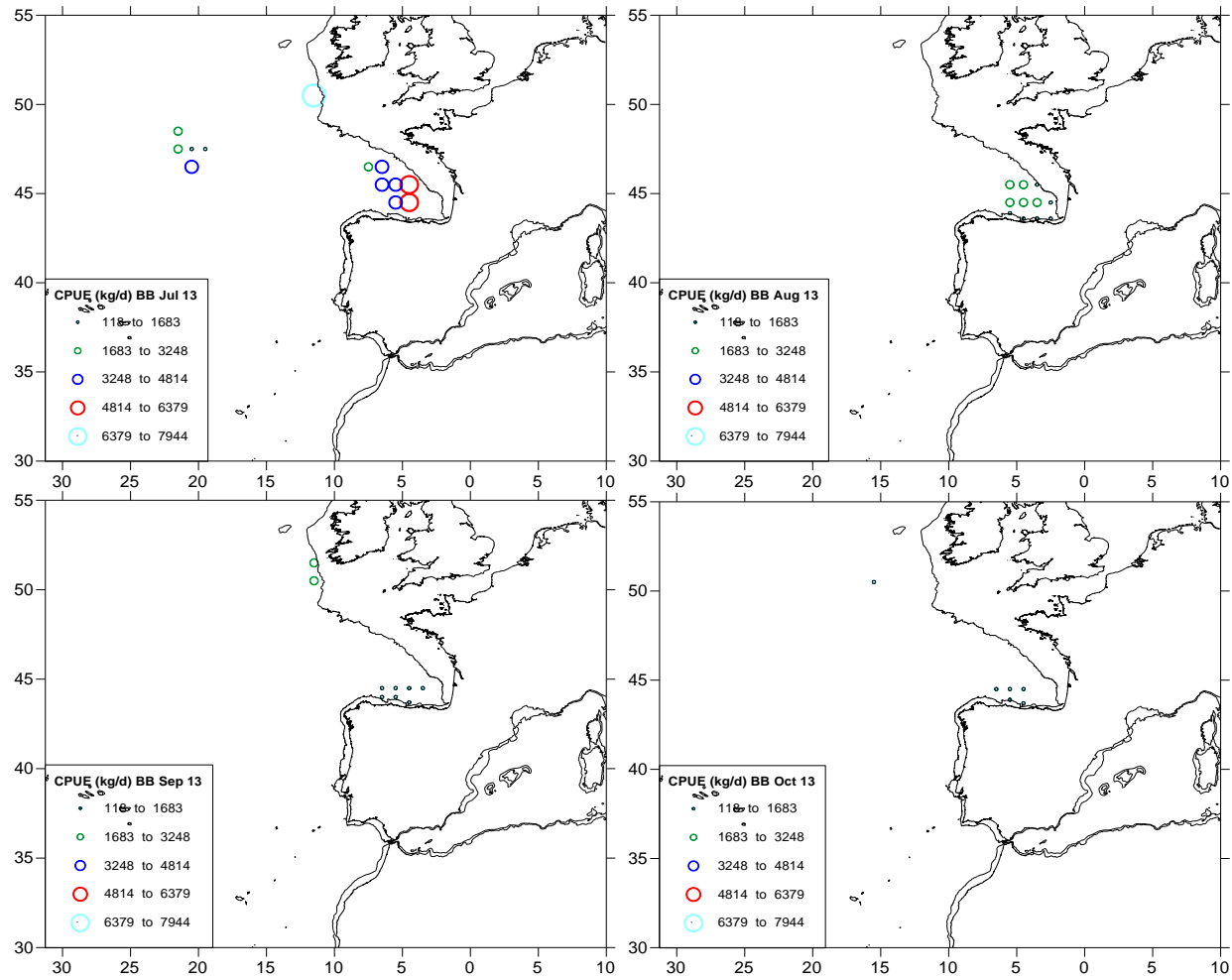


Figure 1b. Spanish bait boat nominal CPUE distribution in 2013 fishing season derived from interviews to skippers.

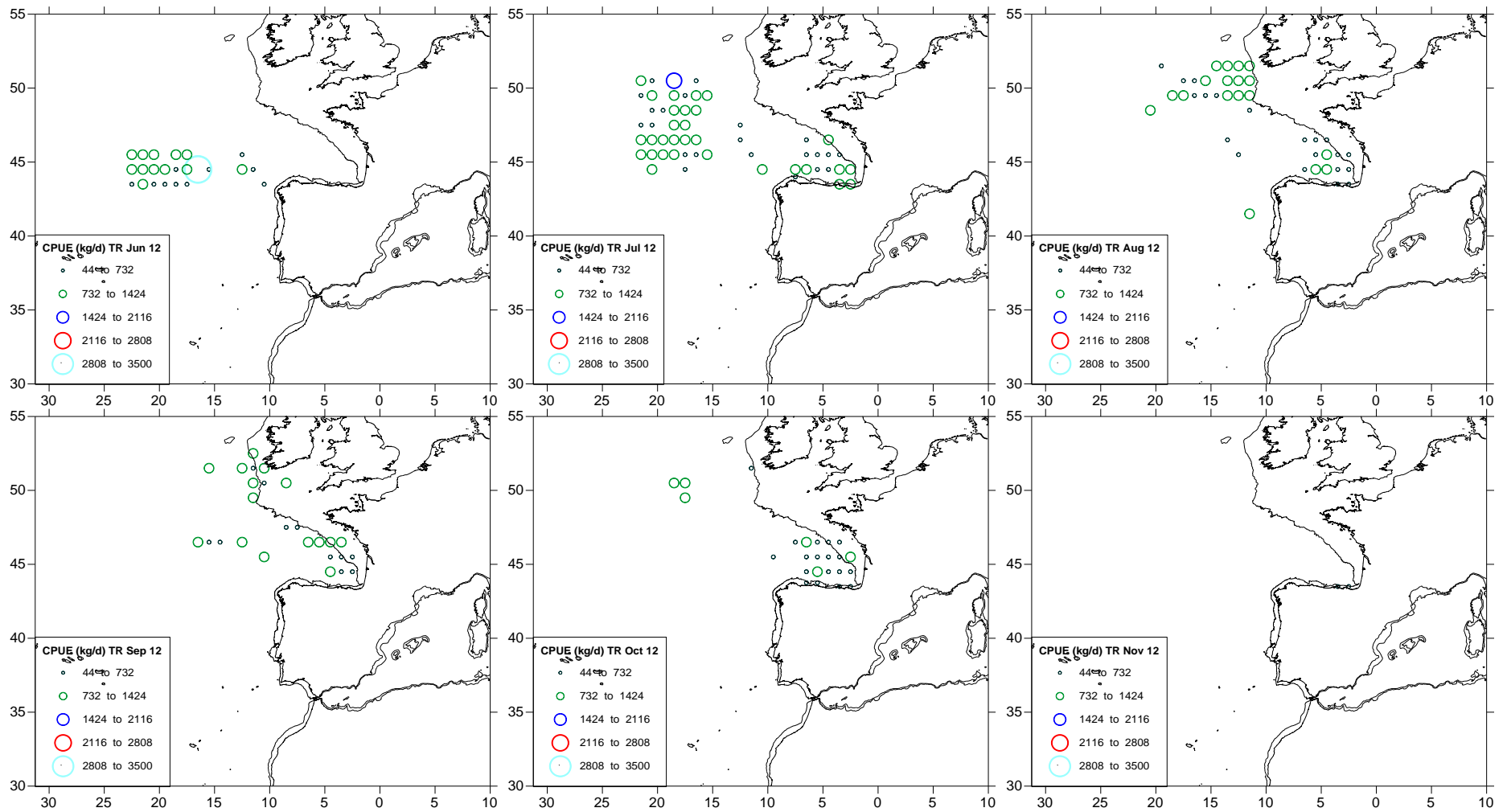


Figure 2a. Spanish troll nominal CPUE distribution in 2012 fishing season derived from interviews to skippers.

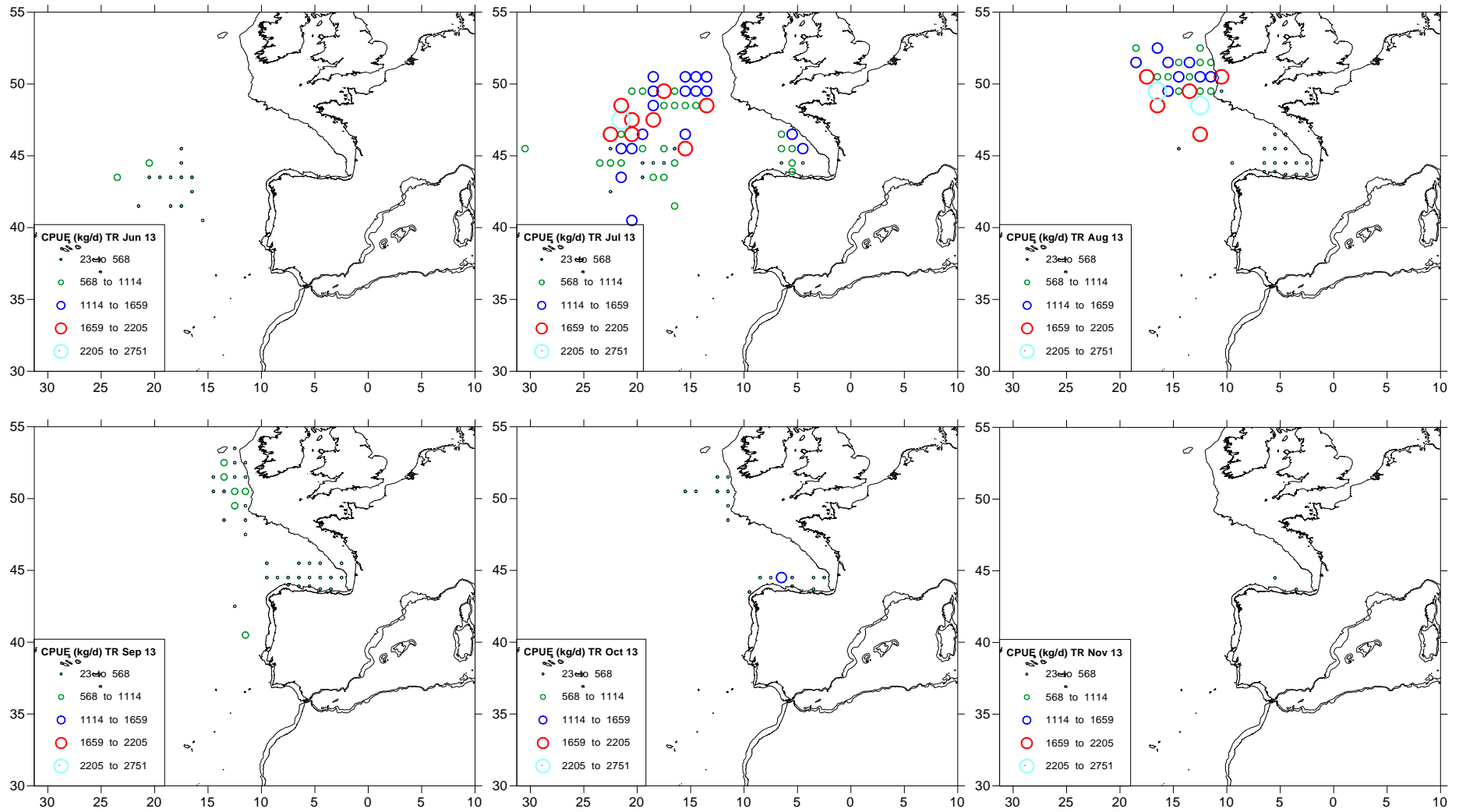


Figure 2b. Spanish troll nominal CPUE distribution in 2013 fishing season derived from interviews to skippers.

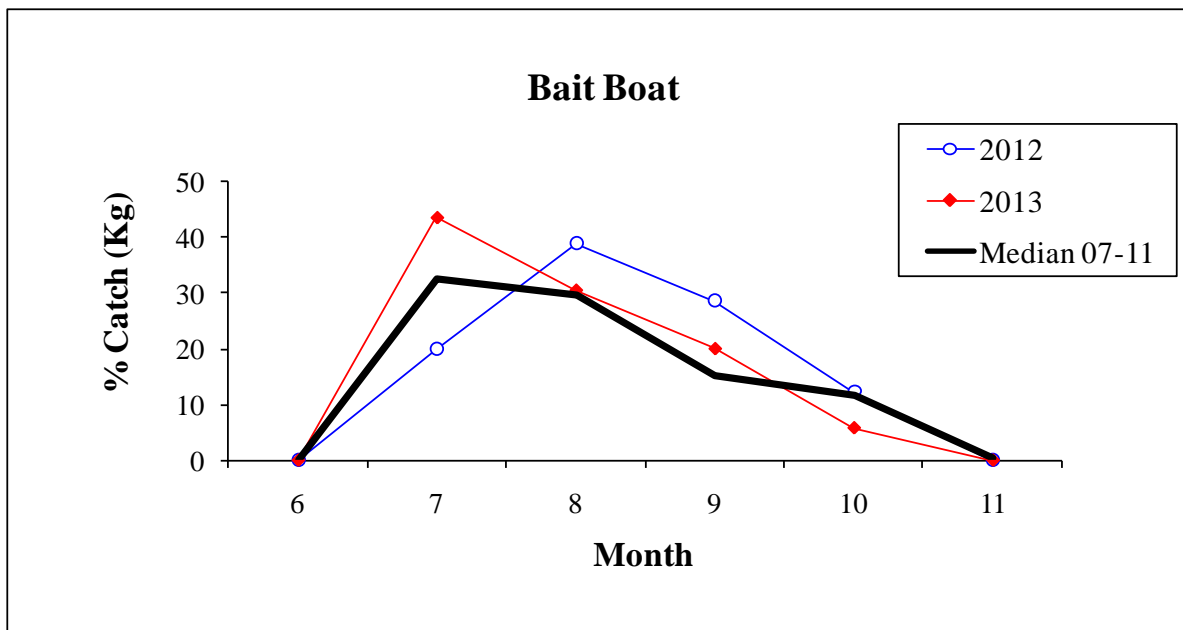


Figure 3a. Seasonality of Spanish albacore catch by bait boat fleet in 2012 and 2013 and median for the period 2007-2011.

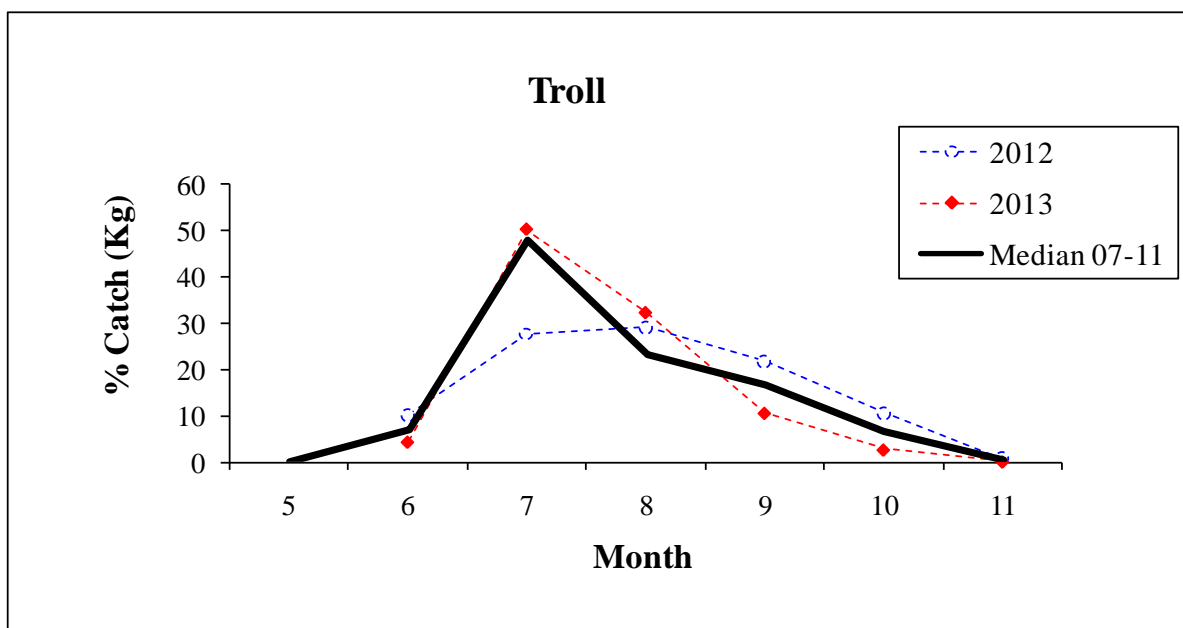


Figure 3b. Seasonality of Spanish albacore catch by troll fleet in 2012 and 2013 and median for the period 2007-2011.

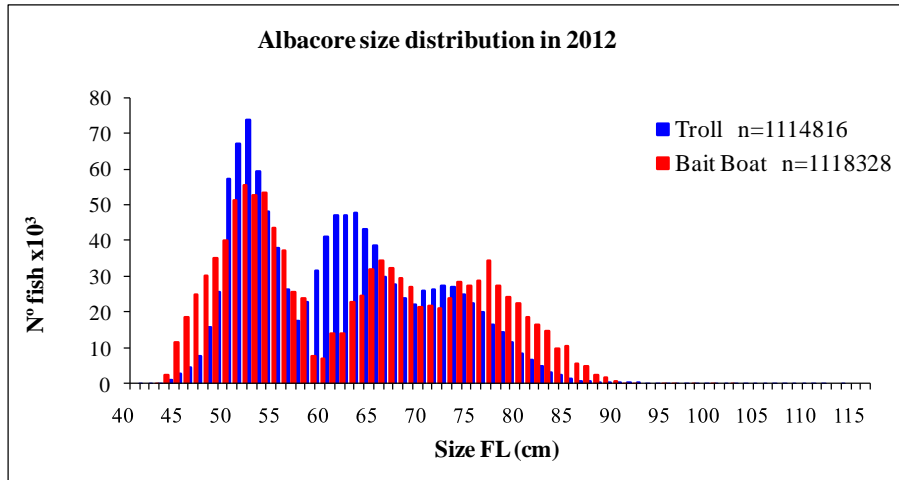


Figure 4a. Catch at size distribution caught by baitboat and troll fleets in 2012.

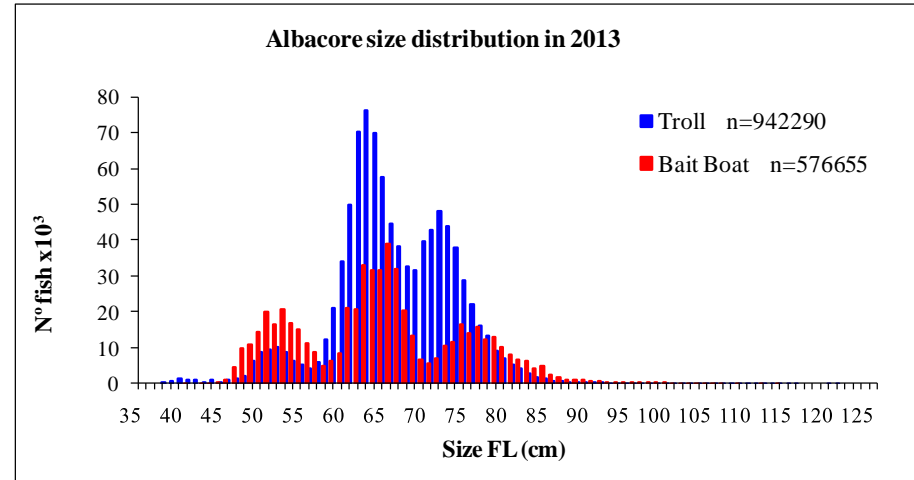


Figure 4b. Catch at size distribution caught by baitboat and troll fleet in 2013.

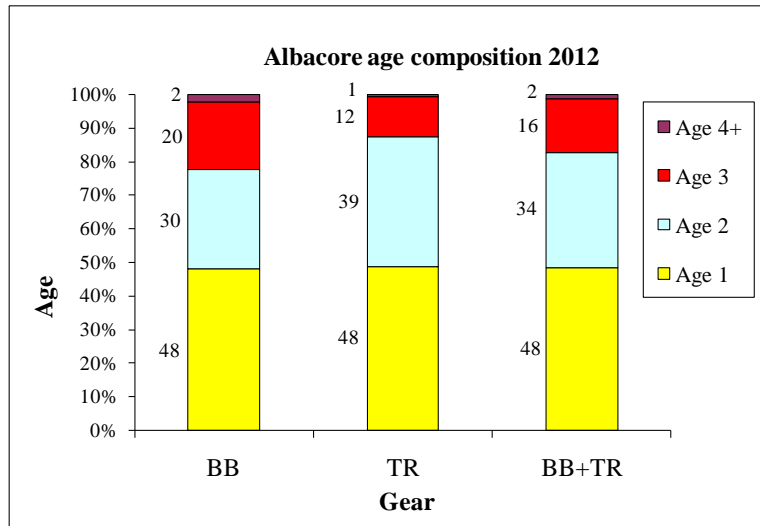


Figure 4c. Age composition of Spanish albacore surface catch in 2012.

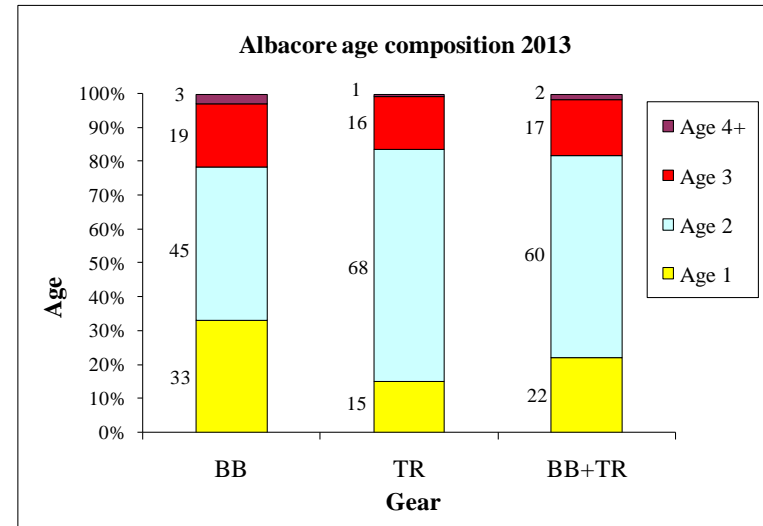


Figure 4d. Age composition of Spanish albacore surface catch in 2013.