

**BASE STUDY FOR MONITORING THE RESERVE EFFECT IN
THE CABRERA NATIONAL PARK, BALEARIC ISLANDS.
AN INDICATOR SPECIES EXAMPLE : *EPINEPHELUS GUAZA* (L.)**

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During the summer 1993, two years after the establishment of the Cabrera National Park, a survey of principal fishery species was conducted using visual methods. Here we present the results obtained for the density and sizes distribution of *E. guaza*. The biological and ethological features of this species, together with the irregularity of its recruitment, north of latitude 41°5N (CHAUVET & FRANCOUR, 1990; GARCIA & ZABALA, 1994) and its high commercial value, have caused the stocks of *E. guaza* to decline notably in several parts of the Mediterranean.

In Balearic waters where the species shows a high recruitment, the fishing pressure has been reflected in the scarcity of adult individuals. At present, the artisanal fishery is the only way of exploitation permitted around Cabrera. The selection of sampling zones has been based on the different regulations which will be enforced on the artisanal fisheries once the management for the park will be operational.

The following sampling stations have been studied : 3 stations on rocky blocks at 5-10 and 20-25 m depth (photophilic algae benthic community : P.A), 2 stations on vertical underwater cliffs at 5 and 15 m (P.A), 2 stations on rocky blocks at 40 m (sciaphilic algae benthic community) and 1 station on *Posidonia oceanica* meadow.

Censuses were carried out over transects 100-210 m long and 10 m width. Daily censuses were made for at least 6 consecutive days between 10.00 and 14.00 hours. In each transect, the number of individuals observed was noted and their size estimated. All divers had been previously trained in estimating fish size underwater using a method similar to that of BELL *et al.* (1985).

The greatest density of groupers was found at stations 5-10 and 20-25 m depth at zone 3 (Table 1). The richness of this zone, verified by the abundance of other species, can be linked to three principal factors: a) site exposed to all winds, b) high degree of complexity of bottom structure, and c) constant currents which may increase the production at different trophic levels. No groupers were observed at the stations on rocky blocks at 40 m depth or in *Posidonia oceanica* meadow.

Another notable feature is the segregation of small and large sizes in shallow and deep waters respectively (Fig. 2). The nature of these differences is probably due to two main factors: a) the recruitment occurs in the first few metres depth, b) before 1991, the Cabrera area was intensively fished, especially by spearfishing. This kind of fishing is known to be depth selective. Bottoms at 5-10 m are more accessible than those at 20-25 m. Natural bathymetric distribution of *E. guaza* (CHAUVET, 1991) and results from other reserves (GARCIA & ZABALA, 1994) indicate that shallow waters of Cabrera have not been yet recolonized by big groupers.

Transects/Statistics	Mean	C.L. 95%	C.V
Zone 1. Blocks: 5-10m	6,24	(5,23-7,41)	17%
Zone 1. Blocks: 20-25m	3,57	(2,63-4,75)	27,8%
Zone 2. Blocks: 5-10m	4,21	(3,05-5,68)	35,45%
Zone 2. Blocks: 20-25m	0,97	(0,38-1,83)	53,33%
Zone 3. Blocks: 5-10m	7,17	(4,75-9,91)	33,93
Zone 3. Blocks: 20-25m	6,17	(4,15-9,07)	32,15%
Zone 2. Cliffs: 5m (0-10)	1,76	(1,09-2,43)	36,36%
Zone 2. Cliffs: 15m (10-20)	0,78	(0,14-1,42)	78,2%
Zone 3. Cliffs: 15m (10-20)	1,9	(0,41-3,38)	62,63%

Table 1. Mean density of *E. guaza*, 95% confidence limits and coefficient of variation for a surveyed area of 1000 m².

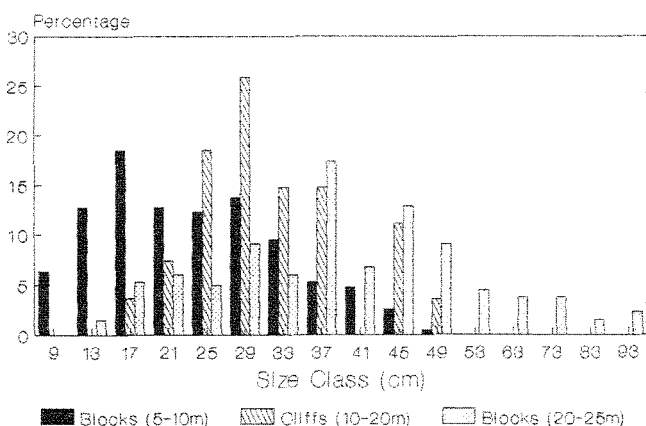


Figure 1. Sizes distribution of *Epinephelus guaza*.

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