

## **Much ado about nothing – the Algarve small-scale octopus fishery flare 4 years hence – non-issues and realities**

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The Algarve small-scale octopus fishery involves the majority of the fishing communities in the area, represented by associations. The species generated an average 3375t annual landings in the area. A 42% mean difference in landings between consecutive years sparks periodic social unrest, but there is no trend for the last 41 years. The high first-sale value (frequently above €5/Kg) has led to widespread increase in (unreported) effort, which is not proportionately matched by increased returns. Fishers' unfulfilled hopes sprouted reasons unsupported by facts, and the resulting pressure generated erratic management policies which fed back on dissatisfaction creating antagonist factions. This study describes the process of political response to pressure along a 3-4 year period upon a surge of unrest following a 55% negative oscillation in production (2008-2009). It describes the management system proposed, and the reasons why a mismatch between objectives and results has ensued. It shows that this variable-supply/high-productivity system must be optimized by exploiting the resources' potential through management of catch timing. The reasons why fishing at an apparently unsustainable effort level does not carry sustainability issues in practice are discussed, and a case against the establishment of TACs for this fishery is made.

### **Introduction**

The common octopus is a resilient opportunistic species, which increased in abundance in Portugal against a negative trend for other commercial species. In the Algarve, there is to be no trend (positive or negative) that can be identified for this species, whilst in general other resources have also declined. Local communities in the Algarve have a longer tradition of octopus fishing than the rest of the country. In respect of these two factors alone, it is no surprise that society in the Algarve is generally more sensitive to octopus-related issues. As an economic activity, fishing is no different from other investments in production, with a tie between investment level and expected outcome, generally associated to a return/risk ratio that is comparable to other production industries. When we consider average octopus abundance fluctuations of 43% however, investment in fishing becomes more akin to speculation, and is not for the light-hearted. Societal emotions become a roller-coaster, exhibiting collective bipolarity between elation and depression. The high reward promise of an easy-selling high-price resource generated high investment levels, beyond the legally established input-controlled management fishery. Stakes ran high and emotions on edge. When suddenly the resource fails to meet even the lowest expectations, the most bold of investors become bitter beggars. For octopus, this story is an introduction to a period of a lot of change from no problem to nothing different. We want to show octopus fishery related statistics, highlight relationships and present biological facts. We also want to confront scientific advice with political decision and show that octopus are not fish. Finally we want to suggest better actions for investors in octopus fishing, and propose more productive avenues for management.

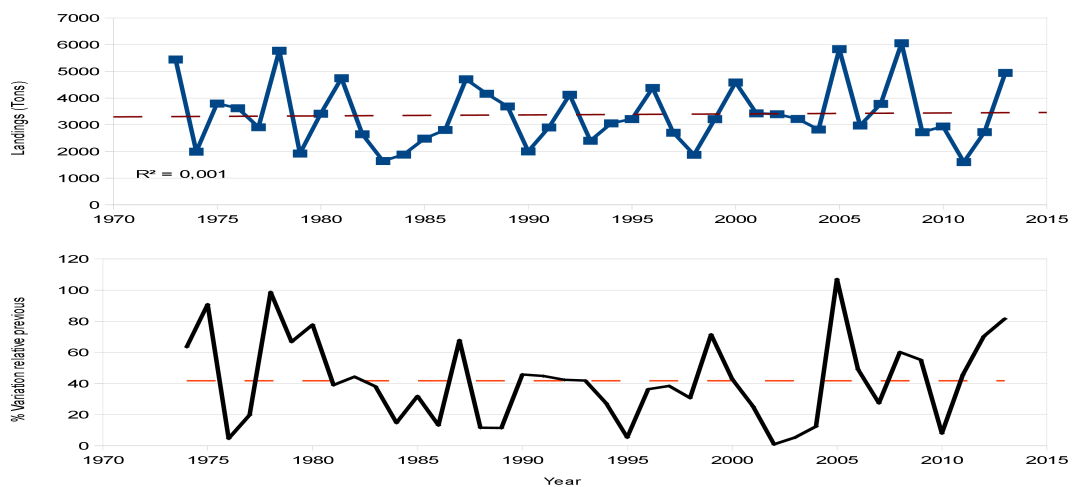
### **Material and Methods**

Fishery statistics were sourced from the national statistics institute (INE, 1974-2014). Biological data are a part of the research activity of IPMA, collected through the acquisition of samples from fishing ports (Peniche and Olhão) and by conducting research surveys throughout the coast with the research

vessel “Noruega” and formerly “Mestre Costeiro” and “Capricornio”. The authors have first-hand knowledge of discussions in committees by being members and having participated in task-forces, meetings and fora. Legal diplomas were published after consultation with the authors. A series of interviews and discussions with stakeholders, both formally and informally, were also used in the preparation of this manuscript. Basic statistical analyses were conducted either from dedicated applications or by writing code in R.

## Results and Discussion

Nationally, octopus has been a high yielding resource with a clear increasing trend (Pilar-Fonseca *et al.*, 2014), whereas in the Algarve no trend is apparent. Figure 1 shows total landings and inter-annual landing fluctuations in the Algarve.



**Figure 1.** Octopus official landings and trend ( $R^2=0.001$ ) in the top panel; absolute percentage variation in relation to previous year and average (broken line) in the bottom panel. Data between 1973 and 2013 from INE.

Fishers claim the resource is decreasing in abundance and demand changes in legislation to provide a boost. Octopus is a one year lifespan species that completely depends on recruitment success for the definition of the year class strength. Numbers of specimens are defined from recruitment on which there is practically no predation other than fishing. 2008 created great expectations due to a 60% increase (to the all-time maximum) on an above average year, after which the resource decreased by 55% remaining below average for 4 years to 2012. This created unrest and accusations which only decreased in 2012, after 70% higher landings than in 2011. In the mean time (2009-2012), 2 task forces were created over a bait issue that allegedly was responsible for the decline in abundance. A new piece of legislation banning the culprit bait was created, then retracted, then the retraction maintained, then the ban recreated with geographic nuances on demand of a “pro” vs. an “against” factions. Scientific advice was the same throughout the period: optimize size of octopus (750-1100g) to maximize biomass return dependent on abundance. Octopus survive catch and discard. They visit traps where they are fed, and then leave at leisure. A very large growth in number of traps equates increased feeding and shelter opportunities, which the environmentally-fixed number of octopus enjoy. Ten times more traps is ten times less return per trap-year. No fewer octopus, no more fishing pressure.

## References

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