http://www.fish.wa.gov.au/docs/frr/frr217/frr217.pdf

3. That sufficient reliable information on the spatial extent of the fishery has been collected to identify the nature of the impacts of the fishery on different habitat types. Information on the spatial extent of both the key habitats and the associated fishing effort will have to be provided. A new project involving large-scale habitat mapping and computer enhancement is being undertaken by Department of Fisheries and two Universities to address this condition.

The above conditions must be completed by the time of the fishery's second annual audit in December 2013.

The WRLF's MSC recertification report can be found at: http://www.msc.org/track-a-fishery/certified/south-atlantic-indian-ocean/western-australia-rock-lobster/2nd-reassessment-downloads

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Red and green spiny lobster populations in Brazil: a sampling program.

From: Raúl Cruz

Spiny red lobster (*Panulirus argus*) and green lobster (*Panulirus laevicauda*) support a large commercial fishery in Brazil. Currently the artisanal fishermen have used different legal models of baited rectangular traps called manzuá or covo (one side entrance) and cangalha (two or three side entrances), all woods coated with wire or nylon mesh. Many illegal models of gill net (called caçoeiras) are still used to catch lobster (Moura, 1963). Since 2000, different designs of artificial shelters called "marambaias" (constructed with materials of opportunity) which are illegal, were introduced in the Northeast lobster fishery grounds.

Figure 1 Artificial shelter called marambaias in a lobster fishing ground in Brazil. The drawing is a free composition by the author to illustrate a shelter drum grouped in layers that will be colonized by lobsters.

In lobster traps, associated fauna is diverse and consists mainly of fish, mollusks and invertebrates (Ivo et al., 1996), constituted mainly by several species of slipper lobster (*Scyllarides brasiliensis*, *Scyllarides delfosi* and *Parribacus antarcticus* (called sapatas lobster) that are caught incidentally in low abundance.

The lobster distribution on the continental shelf of Brazil is located in south western Atlantic between Amapá (04° 26' N 51° 32' W) and Espírito Santo (21° 17' S 40° 56' W) state (Fig. 2). The fishery grounds occur in northern (Amapá and Pará state), northeast (Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco, Alagoas, Sergipe and Bahia state)

and southeast (Espírito Santo state). The northern region of Rio de Janeiro (20 ° 17 'S and 40 ° 14'W) ends the spatial distribution of spiny lobsters.

Figure 2 Map of Brazil showing the distribution of coastal states that fishing lobster: Amapá (AP), Pará (PA), Maranhão (MA), Piauí (PI), Ceará (CE), Rio Grande do Norte (RN), Paraíba (PB), Pernambuco (PE), Alagoas (AL), Sergipe (SE), Bahia (BA) and Espírito Santo (ES). The broken line shows the principal area that fisherman using artificial shelters called "marambaias".

Lobster habitat is widespread with a substrate of reef formations and calcareous algae (Countinho and Morais, 1970) at depths from 1 to 50 m. However in the north region Silva et al. (2003) report a developing lobster fishery in a deep area between 50 to 100 m, and this stock is composed of large-sized lobster (Silva et al., 2008) up to 175 mm (CL). Cruz and Bertelsen (2009) reported that larger females brood more eggs than smaller females, and female lobsters larger than 120 mm (CL) produce >1 million eggs. Fishing larger lobster in deep water reduces the most reproductively important individuals, depresses the population and the reproductive potential of species.

In shallow waters, more than 50% of the lobsters (red and green) that are captured in traps and gill nets are sublegal, and egg-bearing females are sold on the black market (Cruz et al., 2011). This practice is causing a high level of growth overfishing, which occurs when lobsters are harvested before they can reach a reasonable size.

A decrease in the number of sublegal lobsters (<5%) caught by fishermen, could increase the length at first capture, the yield per recruit and catches, as demonstrated in the Cuban lobster fishery by Cruz et al. (1991). This fishing scenario is probably one of the determining factors in the change and the decline in landings of lobster species in Brazil.

The Brazil fishery has been regulated for more than a half century, but control measures are inconsistent in the fishery and law enforcement is often ineffective. From 1965 to 1993, the number of gear by type and years was compiled for region and state. The recorded operation by boat and months was divided into catch (kg) and number of gear checked (unit of effort) by the fishers. In the same period biological sampling data (lobster length composition) was undertaken in coastal landed and fishing industry enterprises. Unfortunately, since 1993 this important biological data was not collected.

Recent genetic evidence suggests that the population of *Panulirus argus* in the Caribbean Sea and the continental shelf of Brazil are genetically and ecologically different (Diniz et al., 2005). The sea coast of Brazil has several lobster populations, commercial (*P. argus, P. laevicauda*) and noncommercial (*Panulirus echinatus*, and some species of *Scyllaridae*), that do not depend on foreign transmigration of larvae, have a closed geographic access and do not have country neighbors that fish lobster in its continental shelf.

A sampling methodology and a reliable database of the fishery has been proposed in new book. This methodology takes into account that lobster recruitment (pueruli) is caused by a single source (Cruz et al., 2011), the wide distribution of lobsters covering an area of 356 610 km² to isobaths of 100 m (Cruz et al., 2011), and the absence of a sampling system in the sea to collect information of the life cycle of lobsters and fishery parameters.

The book on the proposed methodology was published in Portuguese and Spanish.

We opened the book with a presentation of the Banco do Nordeste do Brasil S.A., who was the sponsor of the book, the Preface and a brief Introduction. Then, a bibliographic review of 50 years of research on the lobster population which began with the founding of the Institute of Marine Sciences (Labomar) in Fortaleza city, State of Ceará. Its founder was Professor Dr Melquíades Pinto Paiva and current director Professor Dr. Luis Parente Maia.

We examine the following aspects: The database used, an analysis of the landing (municipalities and state), seasonality of the catch of lobster (red, green and Scyllaridaes), methodology for sampling: adults, pre-recruits, juveniles and puerulus; in these chapters we discuss and propose a stratified random sampling, the sample size and fishery indices. Good information is given of the lobster industry and how it will be used in population dynamics. In particular, it gives exploratory information about the oceanic process and the recruitment variability.

Furthermore, considering that this book is aimed at different sectors of society, it includes various aspects of external and internal anatomy of lobsters, great photos of the species caught, the techniques used to measure the lobsters and how they should organize the catch and effort statistics.

The book ends with a discussion and consideration of the aspects reviewed. The book is bilingual, allowing a wide dissemination of its results in the two main lobster fishing regions most economically important, Western Atlantic and Brazil, consisting mainly of speakers of the language regions bordering between Spanish and Portuguese.

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Are rock lobster larvae gourmets or gluttons?
Neither! New research suggests that larvae live in a nutritional poorhouse

From: Anya M. Waite

At the start of our study on western rock lobster (*Panulirus cygnus*) larval nutrition in the eastern Indian Ocean, we originally posed the question "Are rock lobster larvae gourmets or gluttons?", but initial results suggest that except for when rock lobster larvae find tidbits of their favourite food, they are in fact living on the nutritional equivalent of gruel in the poorhouse. The FRDC-funded project "*Biological Oceanography of Western Rock Lobster Larvae*" (2010-2013) has yielded some key new insights into how the larvae, the *phyllosoma*, feed in the wild.

Our first published journal paper, just accepted in the international journal *PLoS One* (Saunders et al., 2012), indicated that late stage phyllosoma have a marked preference for arrow worms, or chaetognaths (Fig. 1), above other prey such as krill and salps. However the prey field suggests that they may contact chaetognaths only rarely (Säwström et al., in preparation). Further, genetic analyses indicate that many phyllosoma are in fact starving, such that prey densities may be critical determinants of phyllosoma health (O'Rorke, submitted). Between high-quality prey encounters, surprisingly, phyllosoma have been seen to consume jellies that may not have great nutritional value, the colonial radiolarians. This is the first time these organisms have been detected as phyllosoma prey.

Cruises in July 2010 and August/September 2011 targeted waters from 111° E to 115° E and from 28° to 33° S. We found phyllosoma at the surface (primarily at night) in almost all waters west of the core flow of the Leeuwin Current