***Supplementary Material 1***

**Food-web and ecosystem structure of the open-ocean and deep-sea environments of the Azores, NE Atlantic**

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1. **Functional groups defined for the ecosystem model of the open-ocean and deep-sea environments of the Azores**
	1. **Phytoplankton**

Santos et al. (2013a) evaluated phytoplankton biomass variability and community structure for the Condor seamount in the Azores EEZ. The phytoplankton community was very diverse and showed strong seasonal variation, with mainly Diatoms (*Pseudo-nitzschia* spp. and *Chaetoceros* spp.), Dinoflagellates (e.g. *Ceratium* spp.) and Coccolithophores (e.g. *Ophiaster* spp.) present. Highest abundances occurred in March (winter/spring), while lower abundances were noted in November (autumn). A complete list of the identified phytoplankton taxa for the condor seamount is presented in Santos et al. (2013a). A phytoplankton biomass estimate of 2.90 t·km-² wet weight (WW) was taken from the Ecopath model of the Condor seamount (Bon de Sousa, 2012), assuming the Condor seamount to be representative for the Azores EEZ. Bon de Sousa (2012) made a depth integration of Chlorophyll a concentrations as presented in Lambardi et al. (2011), and used conversion factors of 1 g Chla for 32 g of carbon (Fasham et al., 1985) and 10 g WW for each gram of carbon (Pauly and Christensen, 1995) to calculate the final estimated phytoplankton biomass.

Daily net primary production standard product data was provided by Ocean Productivity and was processed to annual mean values (gC·m-2·yr-1) by Patrícia Amorim. These annual mean values were then converted into wet weight trough the same conversion factor used for the biomass estimation (Pauly and Christensen, 1995). An average of 1671.2 t·km-2·yr-1 WW was obtained for 2003-2007, and using the biomass estimate of 2.9 t·km-2 WW used previously, the P/B ratio equals to 576.29 year-1. The phytoplankton communities are present within the whole model area, so the habitat fraction area is set at 100%.

* 1. **Macro-algae**

Macro algae inhabits the shallow rocky subtidal zone (0–50 m) around the islands. Neto (2001) studied the benthic algal communities of two subtidal sites on opposite coasts of the São Miguel Island in the Azores archipelago. *Corallina* spp. and other red algae such as *Pterocladiella capillacea* were the most abundant species at the 5m subtidal zone, while brown algae such as *Zonaria* and *Stypocaulon* dominated at 15m. A full list of macro-algal species is provided by the author (Neto 2001). The same author investigated algal density and reported an average density of 500-600 g·m-2 dry weight for the shore of São Vicente, in São Miguel Island (Neto, 1997). Using a ratio of 0.21 g dry weight for each gram of wet weight (Mackinson, 1996), this resulted in a biomass estimate for the inhabitable area of 2619 t·km-2. Due to lack of data, the P/B of 4.34 for benthic plants, presented in the Strait of Georgia model (Canada) was used (Mackinson, 1996). Half of the 0-50m depth range is assumed to be inhabitable for algal species, amounting to a total of 331 km² of potential algae beds, and thus a habitat fraction area of 0.03% is used.

* 1. **Small-size zooplankton**

Small-size zooplankton communities over and around the Condor seamount, collected in the first 100m of the water column, were recently characterized (Lambardi et al., 2011). The author reported that the communities showed significant variation in diversity and abundance among and between seasons. Maximum abundance (2.41 individuals·l-1) and biomass (57.47 mg·m-3) together with lowest taxonomical diversity (95% of copepods) was registered in March, while lower levels of abundance and biomass were registered in August and November. Copepoda Calanoida and Copepoda Poecilostomatoida were most abundant year-round, and form together with Chaetognata, Appendicularia and Cladocera the most abundant zooplankton groups. Bivalve larvae, Radiolaria, Copepoda Cyclopoida, Ostracoda, Appenducularia and Doliolida were among the lesser abundant taxa identified in the Condor Bank area. The Condor seamount zooplankton community is considered as representative for the zooplankton community in the entire model area. These zooplankton groups are considered to inhabit the whole model area, thus the habitat fraction area is set at 100%.

The small-size zooplankton group was mainly made up of Copepods, Radiolaria, Ostracoda, Appenducularia and Doliolida. A P/B of 11.21 and a Q/B of 43.29 was taken from Morato et al. (2009). EE was set to 0.9. Diet for the small-size zooplankton group was taken from Guenette and Morato (2001) and consists of 90% phytoplankton and 10% detritus.

* 1. **Large-size Zooplankton**

This group consists of large-size and gelatinous zooplankton. Gelatinous zooplankton consists mainly of Thaliacea, Hydrozoa and Scyphozoa, while the large-size zooplankton consists amongst others of Mysids, Euphausiids, Chaetognaths and Decapods’ larvae (Morato and Pitcher, 2002). P/B and Q/B for the large-size and gelatinous functional zooplankton groups, as presented in Morato et al. (2009), were averaged to respectively 4.78 and 15.50 year-1, respectively. EE was set to 0.9. This zooplankton group were considered to inhabit the whole model area and thus the habitat fraction area is set at 100%.

Diet for the zooplankton group was also averaged from the large-size and gelatinous zooplankton groups in Morato et al. (2009). Consequently, the resulting zooplankton group is assumed to feed 50% on detritus, 10% on phytoplankton, 20% on small-size zooplankton, 15% large-size and gelatinous zooplankton (cannibalism), and 5% on shrimps. This diet was modified to 30% feeding on phytoplankton, 50% on small-size zooplankton, 15% on detritus, and 5% of cannibalism, based on empirical knowledge.

* 1. **Shrimps**

The group of shrimps include pelagic and benthic shrimps such as *Acanthephyra purpurea*, *Systellapsis debilis*, *Oplophorus spinosus*, *Ligur ensiferus*, *Plesionika narval*, *Plesionika edwardsii*, *Plesionika williamsi*, *Plesionika martia*, *Plesionika gigliolii*, *Plessonika ensis*, *Heterocarpus laevigatus*, *Heterocarpus ensifer*, *Heterocarpus grimaldii*, *Parapasiphae sucatifrons* and *Funchalia villosa* (Martins and Hargreaves, 1991; D’Udekem D’Acoz et al., 2001 and De Girolamo et al., 2011). Some Palaemonid shrimps are commercially harvested (Pham et al., 2013). P/B and Q/B values were taken from Morato et al. (2009) and were equal to 1.45 year-1 and 9.67 year-1. EE was set to 0.95. The shrimp species are expected to inhabit the total EEZ area, and therefore the habitat fraction area was set at 100%. Diet for the shrimp group was taken from Guenette and Morato (2001) and averaged for the benthic and pelagic shrimps. The resulting diet is 38% small-size zooplankton, 25% large-size zooplankton, 25% phytoplankton and 13% detritus.

* 1. **Cephalopods**

This group consists of the exploited cephalopod species *Loligo forbesii* and *Octopus vulgaris*, together with *Ommastrephes bartramii*, *Pteroctopus tetracirrhus* and *Scaeurgus unicirrhus*, and a number of small-size and large-size non-commercial cephalopods among which Chiroteuthidae, Enoploteuthidae, Ommastrephidae, Octopoteuthidae and Histioteuthidae spp. (Clarke, 1993 and Pham et al., 2013). The values of P/B and Q/B were calculated from Morato et al. (2009) by averaging the groups of resident, drifting small-size, and drifting large-size cephalopods, used in the model. The estimated values for P/B and Q/B amounted to 3.28 year-1 and 12.29 year-1. EE was set to 0.9. Different cephalopod species can inhabit both the shallow and deeper parts of the model area and the habitat fraction area will be set at 100%. The diet for the cephalopods was averaged from the same three cephalopod groups (resident, drifting small-size and drifting large-size), this time used in Morato et al. (2009). The resulting diet is 8% small-size zooplankton, 25% large-size zooplankton, 10% shrimps, 3% crabs, 2 % shallow water small-size fish, 3% pelagic small-size fish, 22% mesopelagic fish, 7% bathypelagic fish, 10% bathydemersal fish and 10 % detritus.

* 1. **Crabs**

This group includes the commercial lobster species *Palinurus elephas* and *Scyllarides latus*, and the not commercially important *Scyllarus arctus*. The group is further made up by the moderate commercially important crab species *Maja squinado*, *Grapsus grapsus*, *Cancer bellianus*, *Paromola cuvieri*, *Chaceon affinis*, *Scyllarides latus* and *Dardanus callidus* and a few non-commercial shallow and deep-sea crab species (e.g. *Cryptosoma cristata*) (Paula et al., 1992; Pham et al., 2013). A P/B of 1.6 year-1 and Q/B of 10 year-1 for the crabs group were obtained from Morato and Pitcher (2002). EE was set to 0.95. The crabs and lobsters groups include both shallow and deep-sea species and thus the habitat fraction area is set at 100%. The diet for the crabs and lobsters was taken from Guenette and Morato (2001) and consisted of 3% shrimps, 3% crabs, 5% benthic filter feeders, 7% other benthos, 3% benthic worms and 79% detritus.

* 1. **Benthic filter feeders**

Benthic filter feeders are regular bycatch of the bottom longline fishery of the Azores (Pham et al., 2013). The group is made up of species belonging to four phyla (Porifera, Bryozoa, Cnidaria and Foraminifera) and includes cold-water-corals such as Anthozoans and Hydrozoans (e.g. *Lytocarpia myriophyllum*) (Braga Henriques et al., 2013). The P/B and Q/B were taken from Morato and Pitcher (2002), from estimates based on sponges and corals, and equal to 0.8 year-1 and 9 year-1. EE was set to 0.95. Benthic filter feeders are assumed to be able to inhabit the complete model area, thus the habitat fraction area is set at 100%. The diet for benthic filter feeders was also taken from Morato and Pitcher (2002), and consisted of 25% phytoplankton and 75% detritus. This diet composition was modified to 10% phytoplankton, 5% small-size zooplankton and 85% detritus, because this group is mainly made up of deepwater corals occurring below the photic zone.

* 1. **Benthic worms**

The benthic worms functional group consists of Polychaetes and Annelida species. P/B and Q/B for this group were taken from the EwE model of the deep-water fisheries (400-2000m) in ICES Division VIa (Howell et al., 2009), and equal respectively 2.28 and 11.40 year-1. EE was set to 0.95. The habitat fraction area fraction is set at 100%, as it is assumed that the Polychaetes and Annelida species occur in the whole model area. Diet for this group was taken from Guenette and Morato (2001) and consists of 20% small-size zooplankton and 80% detritus.

* 1. **Other benthos**

This group includes crustaceans (e.g. the commercially important *Megabalanus azoricus*), echinoderms (e.g. *Hippasteria* spp.), bivalves (e.g. *Neopycnodonte zibrowii*) and gastropods (e.g. the commercial *Patella* spp., *Haliotis tuberculata* and *Murex trunculus*) (Morato et al., 2001; Pham et al., 2013). In absence of local data, the P/B and Q/B of respectively 3.00 year-1 and 10.00 year-1 were taken from the P/B and Q/B for benthic invertebrates used in the EwE model of the deep-water fisheries (400-2000m) in ICES Division VIa (Howell et al., 2009). EE was set to 0.95. The other benthos group includes both shallow as deep-water species, and the habitat fraction area is thus set to 100% of the model area. The diet of other benthos was obtained from Guenette and Morato (2001) and consisted of 1% other benthos, 1% benthic worms, 0.2% macroalgae, 1.8 % phytoplankton, 15% small-size zooplankton and 81% detritus.

* 1. **Small-size shallow water fish**

This group consists of the shallow water species with an asymptotic length smaller than 25 cm. The shallow water small-size fish group includes amongst others: *Chelon labrosus*, *Scorpaena scrofa*, *Boops boops*, *Scorpaena maderensis*, *Parablennius ruber*, *Coris julis* and *Echiichthys vipera*. The shallow water small-size fish are mainly targeted by bottom longline/handline fishery with *Chelon labrosus*, *Scorpaena scrofa*, *Boops boops* and *Scorpaena maderensis*, the main commercial species in this group. A Q/B of 8.31 year-1 was calculated for this group, and a P/Q value of 0.30 year-1 was taken from Darwall et al. (2010) and Costa et al. (2007). EE was set to 0.95. The shallow water small-size fish group is assumed to only occupy the 0-100m depth layer of the model area, amounting to a habitat fraction area of 0.14%. The diet for this group was taken from Guenette and Morato (2001), and is made up of 2% phytoplankton, 20% algae, 15% small-size zooplankton, 5% large-size and gelatinous zooplankton, 3% shrimps, 8% crabs, 19% benthic worms, 33% other benthos, 7% shallow water small-size fish (cannibalism) and 1% detritus.

* 1. **Medium-size shallow water fish**

This group consists of shallow water fish species with an asymptotic length larger than 25 cm and smaller than 44 cm. *Diplodus sargus sargus*, *Balistes capriscus*, *Xyrichtys novacula*, *Mullus surmuletus*, *Pagellus acarne* and *Bodianus scrofa* are the most abundant species in this group. *Diplodus sargus sargus* and *Balistes capriscus* are the two most commercially important fish in this group, and are caught by both the recreational and bottom longline/handline fisheries. A Q/B of 6.30 year-1 was calculated for this group, and a P/Q value of 0.20 was taken from Darwall et al. (2010), Costa et al. (2007), and Morato et al. (2003a). EE was set to 0.95. The shallow water medium-size fish group is assumed to only occupy the 0-100m depth layer of the model area, amounting to a habitat fraction area of 0.14%.The initial diet for this group was adopted from Guenette and Morato (2001) and and consists of 8% phytoplankton, 1% large-size and gelatinous zooplankton, 3% shrimps, 12% crabs, 1% benthic filter feeders, 7% benthic worms, 25% other benthos, 10% shallow water small-size fish, 7% shallow water medium-size fish, 2% mesopelagic fish, 15% demersal small-size fish and 9% detritus.

* 1. **Large-size shallow water fish**

This group includes, amongst others, moray eel species such as *Muraena helena* and *Gymnothorax unicolor*, and other shallow water fish species with an asymptotic length larger than 44cm, including *Sparisoma cretense*, *Serranus atricauda*, *Pseudocaranx dentex*, *Epinephelus marginatus*, *Labrus bergylta* and *Sarpa salpa*. *Sparisoma cretense* and *Serranus atricauda*. *Pseudocaranx dentex* and *Muraena helena* are the four most commercial species in this group, and they are targeted by the recreational and bottom longline/handline fisheries. A Q/B of 4.42 year-1 was calculated for this group, and a P/Q value of 0.10 was taken from Darwall et al. (2010), Afonso et al. (2008a,b). EE was set to 0.95. The shallow water large-size fish group is assumed to only occupy the 0-100m depth layer of the model area, amounting to a habitat fraction area of 0.14%. The diet for this group was calculated based on Guenette and Morato (2001), Morato et al. (2000), and Figueiredo et al. (2005), and consists of 11% macroalgae, 3% large-size and gelatinous zooplankton, 7% shrimps, 8% cephalopods, 13% crab, 3% benthic worms, 15% other benthos, 16% shallow water small-size fish, 6% shallow water medium-size fish, 0.2% shallow water large-size fish (cannibalism), 10% demersal small-size fish, 7% demersal medium-size fish and 1% detritus. However, based on empirical knowledge, 1% was assigned to *Phycis phycis*. To account for this, the total added diet percentage was deducted from the original diet constituents.

* 1. **Small-size pelagic fish**

This group consists of the epipelagic species with an asymptotic length smaller than 53 cm. The species of this group are: *Trachurus picturatus*, *Sardina pilchardus*, *Scomber colias*, *Scomberesox saurus saurus*, *Atherina presbyter*, *Engraulis encrasicolus* and *Cubiceps gracilis*. *Trachurus picturatus*, and *Sardina pilchardus* are the only commercial species in this group, and are caught by the recreational, pole and line livebait, small-size pelagics and bottom longline/handline fisheries. A Q/B of 9.47 year-1 was calculated for this group, and a P/Q value of 0.30 was taken from Darwall et al. (2010). EE was set to 0.95. The small-size pelagic fish group is assumed to occupy the entire model area, so the habitat fraction area is set at 100%. The small-size pelagic fish group’s diet was obtained from Guenette and Morato (2001) and consists of 24% phytoplankton, 33% small-size zooplankton, 21% large-size and gelatinous zooplankton, 6% shrimps, 1% cephalopods, 6% crabs, 8% other benthos and 2% small-size pelagic fish (cannibalism).

* 1. **Medium-size pelagic fish**

The medium-size pelagic fish group consists of the epipelagic species larger than 53 and smaller than 100 cm. The species belonging to this group are: *Sphyraena viridensis*, *Pomatomus saltatrix*, *Pterycombus brama*, *Sarda sarda*, *Seriola dumerili*, *Seriola rivoliana* and *Trachinotus ovatus*. *Sphyraena viridensis*, *Pomatomus saltatrix* and *Sarda sarda* are the most important commercial species of this group. They are mainly targeted by the recreational and bottom longline/handline fleets. A Q/B of 4.33 year-1 was calculated for this group, and a P/Q value of 0.20 was taken from Darwall et al. (2010). EE was set to 0.95. The medium-size pelagic fish group is assumed to occupy the entire model area, so the habitat fraction area is set at 100%. The diet for this group was taken from Guenette and Morato (2001), Barreiros et al. (2003) and is composed of 3% phytoplankton, 1% small-size zooplankton, 2% large-size zooplankton, 3% shrimps, 2% cephalopods, 1% benthic worms, 5% other benthos, 2% small-size shallow water fish, 1% medium-size shallow water fish and 80% small-size pelagic fish.

* 1. **Large-size pelagic fish**

The large-size pelagic fish group consists of epipelagic larger than 100 cm and this group contains the species *Coryphaena hippurus*, *Makaira nigricans*, *Mola mola*, *Tetrapturus albidus* and *Xiphias gladius*. *Xiphias gladius* is a very important commercial species in the Azores EEZ, being one of the main target species of the pelagic longline fishing fleet. *Coryphaena hippurus* is the only other commercially important large-size pelagic fish species and is caught by the recreational and bottom longline/handline fleets. P/B and Q/B for this group were calculated and are, respectively, 0.73 year-1 and 2.50 year-1. EE was set to 0.95. The large-size pelagic fish group is assumed to occupy the entire model area, so the habitat fraction area is set at 100%. Guenette and Morato (2001) estimated that the diet of the large-size pelagic fish species included in this group consists of 22% cephalopods, 2% small-size shallow water fish, 1% shallow water medium-size fish, 40% small-size pelagic fish, 7% medium-size pelagic fish, 2% mesopelagics, 7% small-size demersal fish, 3% medium-size demersal fish, 2% *Beryx splendens*, 1% *Beryx decadactylus* and 9% *Lepidopus caudatus*.

* 1. **Mesopelagic fish**

This group contained mesopelagic (200-1000m depth) fish species regardless of their size, although mostly small (<25 cm): *Eustomias obscurus*, *Idiacanthus fasciola*, *Lestidiops jayakari*, *Maurolicus amethystinopunctatus*, *Serrivomer beani*, *Vinciguerria nimbaria*, *Cyclothone microdon*, *Diaphus rafinesquii*, *Cyclothone braueri*, *Benthosema glaciale*, *Vinciguerria poweriae*, *Notoscopelus bolini* and *Argyropelecus hemigymnus* are the most abundant mesopelagic fish species that make up this group. Mesopelagic species are not targeted by any fishery in the Azores EEZ and are not often caught as bycatch (Pham et al., 2013). A Q/B of 8.62 year-1 was calculated for this group, and a P/Q value of 0.30 was taken from Darwall et al. (2010). EE was set to 0.95. The mesopelagic fish group is assumed to occupy the entire model area, so the habitat fraction area is set at 1. The diet for the mesopelagic species was based on Guenette and Morato (2001) and is made up of 2% phytoplankton, 33% small-size zooplankton, 42% large-size and gelatinous zooplankton, 10% shrimps, 1% cephalopods, 3% crabs, 3% small pelagics, 3% mesopelagics (cannibalism), and 4% detritus.

* 1. **Bathypelagic fish**

This group included bathypelagic (>1000m) fish species and contains, amongst others, the species: *Chiasmodon niger*, *Bathylagus euryops*, *Bathylagichthys greyae* and *Serrivomer beanii*. These species are not targeted by any fleet within the Azores EEZ, and are not often caught as bycatch (Pham et al., 2013). P/B and Q/B were calculated for this group, and equal 0.44 year-1 and 4.90 year-1. EE was set to 0.95. The bathypelagic fish group is assumed to occupy the entire model area, so the habitat fraction area is set at 100%. Diet information was taken from Guenette and Morato (2001) and consists of 25% large-size and gelatinous zooplankton, 10% shrimps, 15% cephalopods, 20% benthic filter feeders and 30% mesopelagic fish.

* 1. **Small-size demersal fish**

This group contains the demersal species with an asymptotic length larger than 31 cm. The small-size demersal fish group is made up out of the species *Arnoglossus rueppelii*, *Aspitrigla cuculus*, *Centracanthus cirrus*, *Capros aper*, *Serranus cabrilla*, *Macroramphosus scolopax* and *Anthias anthias*. The different species in this small-size demersal fish group are of little commercial interest. A Q/B of 7.43 year-1 was calculated for this group, and a P/Q value of 0.30 was taken from Darwall et al. (2010). EE was set to 0.95. The small-size demersal fish group is assumed to only occupy the 100-500m depth layer of the model area, amounting to a habitat fraction area of 0.48%. Guenette and Morato (2001) provided the diet information for this group: 15% large-size and gelatinous zooplankton, 15% shrimps, 1% cephalopods, 28% crabs, 2% benthic worms, 4% other benthos, 19% small-size shallow water fish, 2% medium-size shallow water fish, 5% small-size pelagic fish and 10% small-size demersal fish.

* 1. **Medium-size demersal fish**

The demersal fish species larger than 31 and smaller than 71 cm are assigned to this group. The group is composed by *Antigonia capros*, *Aulopus filamentosus*, *Brama brama*, *Polymixia nobilis*, *Schedophilus ovalis*, *Sphoeroides pachygaster*, *Taractes rubescens*, *Labrus mixtus*, *Lepidorhombus whiffiagonis*, *Coelorinchus caelorhincus* and *Zeus faber*. *Zeus faber*, *Coelorinchus caelorhincus* and *Schedophilus ovalis* are three species caught the by the bottom longline/handline fishery. A Q/B of 4.66 year-1 was calculated for this group, and a P/Q value of 0.20 was taken from Darwall et al. (2010). EE was set to 0.95. The medium-size demersal fish group is assumed to only occupy the 100-500m depth layer of the model area, amounting to a habitat fraction area of 0.48%. Diet composition was taken from Guenette and Morato (2001): 13% shrimps, 4% crabs, 16% benthic worms, 17% other benthos, 4% small-size shallow water fish, 12% medium-size pelagic fish and 34% small-size demersal fish.

* 1. **Large-size demersal fish**

The demersal fish species with an asymptotic length larger than 71 cm are: *Acantholabrus palloni*, *Molva macrophthalma*, *Polyprion americanus*, *Promethichthys prometheus*, *Ruvettus pretiosus* and *Zenopsis conchifera*. *Polyprion americanus* and *Molva macrophthalma* are two commercially important species in the Azores EEZ targeted by the bottom longline/handline fishery and recreational fishing. P/B and Q/B were calculated for the large-size demersal fish group and equal 0.46 year-1 and 3.82 year-1. The large-size demersal fish group is assumed to only occupy the 100-500m depth layer of the model area, amounting to a habitat fraction area of 0.48%. Diet information was obtained from Guenette and Morato (2001): 13% cephalopods, 13% other benthos, 3% small-size shallow water species, 14% medium-size shallow water species, 11% small-size pelagic species, 2% medium-size pelagic species, 5% mesopelagic species, 19% small-size demersal species, 15% medium-size demersal species, 2% large-size demersal species.

* 1. **Small-size bathydemersal fish**

This group consists of the bathydemersal species smaller than 43 cm: *Alepocephalus rostratus*, *Borostomias antarcticus*, *Chlorophthalmus agassizi*, *Hoplostethus mediterraneus mediterraneus*, *Lepidion eques*, *Lepidion guentheri*, *Nezumia aequalis* and *Physiculus dalwigki*. The small-size bathydemersal fish are of no commercial interest. A Q/B of 4.95 year-1 was calculated for this group, and a P/Q value of 0.10 was taken from Darwall et al. (2010). EE was set to 0.95. The small-size bathydemersal fish group is assumed to only occupy the depth strata lower than 500m within the model area, amounting to a habitat fraction area of 0.994. Diet information was taken from Guenette and Morato (2001) and consists of 9% shrimps, 29% crabs, 33% benthic worms, 18% other benthos, 10% small-size demersal fish and 1% small-size bathydemersal fish (cannibalism).

* 1. **Medium-size bathydemersal fish**

The bathydemersal fish larger than 43 cm and smaller than 62 cm make up this group. The group consists of the species *Epigonus telescopus*, *Hoplostethus atlanticus*, *Bathygadus melanobranchus*, *Lyconus brachycolus*, *Magnisudis atlantica* and *Trachyscorpia cristulata echinata*. Of these medium-size bathydemersal fish species, only *Epigonus telescopus* is commercially caught, in low amounts by the bottom longline/handline fishery. A Q/B of 3.31 year-1 was calculated for this group, and a P/Q value of 0.10 was taken from Darwall et al. (2010). EE was set to 0.95. The medium-size bathydemersal fish group is assumed to only occupy the depth strata lower than 500m within the model area, amounting to a habitat fraction area of 0.994. A diet of 11% small-size zooplankton, 18% large-size and gelatinous zooplankton, 29% shrimps, 3% cephalopods, 6% other benthos, 19% mesopelagic fish and 13% small-size demersal fish for this group was obtained from Guenette and Morato (2001).

* 1. **Large-size bathydemersal fish**

Bathydemersal fish species larger than 62 cm are grouped here. The species that make up this group are: *Aphanopus carbo*, *Aphanopus intermedius*, *Coryphaenoides guentheri*, *Coryphaenoides rupestris* and *Synaphobranchus affinis* and *Synaphobranchus kaupii*. *Aphanopus carbo* is a commercially important fish species in the Azores, being mainly targeted by the recently started drifting deepwater longline fishery. A Q/B of 3.53 year-1 was calculated for this group, and a P/Q value of 0.10 was taken from Darwall et al. (2010). EE was set to 0.95. The large-size bathydemersal fish group is assumed to only occupy the depth strata lower than 500m within the model area, amounting to a habitat fraction area of 99.39%. Diet for *Aphanopus carbo* in the Azores was adopted from Santos et al. (2013b) and the rest of the species from Guenette and Morato (2001): 4% large-size and gelatinous zooplankton, 31% shrimps, 10% cephalopods, 5% crabs, 2% other benthos, 15% medium-size pelagic fish, 3% mesopelagic fish, 25% small-size demersal fish, 13% small-size bathydemersal fish and 13% medium-size bathydemersal fish.

* 1. ***Helicolenus dactylopterus***

The blackbelly rosefish (*Helicolenus dactylopterus*) is a demersal fish species inhabiting the 250-600m depth layer in the Azores archipelago (Menezes et al., 2006), and the habitat fraction area was calculated at 0.56%. The species is an important target for the recreational and bottom longline/handline fisheries. A Q/B of 4.57 year-1 was calculated for this group, and a P/Q value of 0.10 was taken from Darwall et al. (2010). EE was set to 0.95. The diet of the blackbelly rosefish was taken from Neves et al. (2012) and consists of 2% large-size and gelatinous zooplankton, 46% shrimps, 2% cephalopods, 5% crabs, 6% other benthos, 1% small-size shallow water species, 1% medium-size shallow water fish, 11% small-size pelagic fish, 2.6 % mesopelagic fish, 9% medium-size demersal fish, 2% small-size bathydemersal fish, 1% medium-size bathydemersal fish and 4% *Helicolenus dactylopterus* (cannibalism).

* 1. ***Conger conger***

The European conger (*Conger conger*) is a demersal fish species inhabiting the 150-550m depth layer in the Azores archipelago (Menezes et al., 2006) and the habitat fraction area was calculated at 0.52%. The species is an important commercial species for the Azores region and is targeted by the recreational and bottom longline/handline fisheries. A P/B and a Q/B of 0.13 year-1 and 2.99 year-1 were calculated for this species. EE was set to 0.95. Diet information for the European conger was taken from Morato et al. (1999): 1% shrimps, 7% cephalopods, 6% other benthos, 6% medium-size shallow water species, 48% small-size pelagic species, 1% small-size demersal species, 2% medium-size demersal species, 7% large-size demersal species, 1% medium-size bathydemersal species and 14% *Helicolenus dactylopterus*.

* 1. ***Pontinus kuhlii***

The offshore rockfish (*Pontinus kuhlii*) is a demersal fish species occurring in the Azores at a depth range of 150-400m (Menezes et al., 2006), and the habitat fraction area was calculated at 0.25%. The species is a commercial target of the recreational and bottom longline/handline fisheries. P/B and Q/B were calculated for this species, and equal 0.25 year-1 and 3.62 year-1. EE was set to 0.95. Diet for the offshore rockfish was taken from Guenette and Morato (2001) and consists of 11% shrimps, 11% crabs, 12% other benthos, 28% small-size pelagic fish and 38% small-size demersal fish.

* 1. ***Raja clavata***

The thornback ray (*Raja clavata*) is a demersal ray species that can be found in the 50-250m depth layer in the Azores region (Menezes et al., 2006), and the habitat fraction area was calculated at 0.19%. The species is caught as bycatch in the recreational and bottom longline/handline fisheries. A P/B and a Q/B of 0.29 year-1 and 4.10 year-1 were estimated for this species. EE was set to 0.95. Diet of the thornback ray was adopted from Morato et al. (2003b) to be composed of 11% large-size and gelatinous zooplankton, 13% shrimps, 15% crabs, 12% other benthos, 2% small-size shallow water fish, 11% medium-size shallow water fish, 31% small-size pelagic fish, 1% small-size demersal fish and 4% *Pagellus bogaraveo*.

* 1. ***Phycis phycis***

The forkbeard (*Phycis phycis*) is a demersal fish species, occurring at 50-300m in the Azores (Menezes et al., 2006), and the habitat fraction area was calculated at 0.24%. The species is an important commercial species in the Azores EEZ, targeted by the bottom longline/handline fishery. P/B and a Q/B were estimated for this species and equal 0.22 year-1 and 4.50 year-1. EE was set to 0.95. Diet information for the European conger was taken from Morato et al. (1999) and consists of 3% shrimps, 17% crabs, 33% small-size shallow water fish, 39% small-size pelagic fish, 5% mesopelagic fish and 3% *Helicolenus dactylopterus*.

* 1. ***Pagrus pagrus***

The red porgy (*Pagrus pagrus*) is a demersal fish species commonly occurring in the Azores between 50 and 150m depth (Menezes et al., 2006), and the habitat fraction area was calculated at 0.12%. The species is a commercial target of the bottom longline/handline fishery. P/B and a Q/B were estimated for this species and equal 0.32 year-1 and 4.73 year-1. EE was set to 0.95. Diet for the red porgy was taken from Guenette and Morato (2001) and consists of 3% macroalgae, 39% crabs, 12% benthic filter feeders, 1% benthic worms, 25% other benthos, 10% small-size shallow water species and 10% small-size pelagic species.

* 1. ***Beryx splendens***

Splendid alfonsino (*Beryx splendens*) is a demersal fish species inhabiting the 300-600m depth layers in the Azores (Menezes et al., 2006). The habitat fraction area was calculated at 0.51%. The species is a commercially important target of the recreational and bottom longline/handline fisheries. A P/B and Q/B of 0.39 year-1 and 3.58 year-1 for the splendid alfonsino were calculated. EE was set to 0.95. Diet information was taken from Gomes et al. (1998). Diet consists of 41% large-size and gelatinous zooplankton, 25% shrimps, 1% cephalopods, 13% other benthos, 2% small-size shallow water fish, 2% medium-size shallow water fish, 9% small-size pelagic fish, 2% mesopelagic fish, 3% bathypelagic fish and 2% small-size demersal fish.

* 1. ***Beryx decadactylus***

The alfonsino (*Beryx decadactylus*) is a demersal fish species inhabiting 350-700m depth layers in the Azores (Menezes et al., 2006). The habitat fraction area was calculated at 0.70%. The species is a commercially important target of the recreational and bottom longline/handline fisheries. A P/B and Q/B of 0.26 year-1 and 2.74 year-1 were calculated. EE was set to 0.95. Diet information was taken from Gomes et al. (1998). It consists of 14% large-size and gelatinous zooplankton, 42% shrimps, 20% crabs, 5% other benthos, 2% small-size shallow water fish, 2% medium-size shallow water fish, 13% mesopelagic fish, 1% small-size demersal fish and 1% small-size bathydemersal fish.

* 1. ***Pagellus bogaraveo***

The blackspot seabream (*Pagellus bogaraveo*) is a demersal fish inhabiting the 100-500m depth layer in the Azores region (Menezes et al., 2006), and the habitat fraction area was calculated at 0.48%. The species is a commercially important target of the recreational and bottom longline/handline fisheries, and the juvenile is caught as live bait for the tuna fisheries (Pham et al., 2013). A P/B of 0.31 year-1 and Q/B of 4.68 year-1 was calculated for the blackspot seabream. Diet composition for the species was taken from Morato et al. (2001) and consisted of 25% large-size zooplankton, 1% shrimps, 4% cephalopods, 3% benthic worms, 1% other benthos, 33% small-size pelagic fish, 33% mesopelagic fish and 4% medium-size demersal fish.

* 1. ***Mora moro***

The common mora (*Mora moro*) is a bathydemersal fish with commercial interest in the Azores, and is targeted by bottom longline/handline fleets (Pham et al., 2013). The habitat fraction area is equal to 99.39%, as the species inhabits the depth layer deeper than 500m. A P/B of 0.17 year-1 and Q/B of 2.69 year-1 was calculated for this species. EE was set to 0.95. Due to lack of data, the diet composition for the common mora was taken from the large-size bathydemersal fish group.

* 1. ***Lepidopus caudatus***

The silver scabbardfish (*Lepidopus caudatus*) is a demersal fish inhabiting the 100-500m depth strata in the Azores region (Menezes et al., 2006), and the habitat fraction area was calculated to 0.005. The silver scabbardfish species is an important commercial species in the Azores EEZ, and is targeted by the bottom longline/handline fisheries. A P/B of 0.3 year-1 and Q/B of 4.8 year-1 was calculated for this species. Diet composition for the silver scabbardfish was taken from Guenette and Morato (2001): 12% small-size pelagic fish, 22% mesopelagic fish, 56% small-size demersal fish and 10% *Lepidopus caudatus*.

* 1. **Rays and sharks**

The groups of the benthic sharks and rays is made up of the shark species *Galeorhinus galeus*; and the rays *Dasyatis pastinaca*, *Dipturus batis*, *Dipturus oxyrinchus*, *Leucoraja fullonica*, *Mobula tarapacana*, *Myliobatis aquila*, *Pteroplatytrygon violacea*, *Raja brachyura*, *Raja maderensis*, *Taeniura grabata*, *Manta birostris* and *Torpedo nobiliana*. *Galeorhinus galeus* and *Dipturus batis* are important bycatch species of the bottom longline/handline fisheries (Pham et al., 2013). A Q/B of 3.13 year-1 was calculated for this group, and a P/Q value of 0.10 was taken from Darwall et al. (2010). EE was set to 0.95. The group is assumed to only occupy the depth strata shallower than 500m within the model area, amounting to a habitat fraction area of 0.61%. Diet contents for this group was assessed based on Guenette and Morato (2001): 10% large-size and gelatinous zooplankton, 6% shrimps, 1% cephalopods, 7% crabs, 3% benthic worms, 10% other benthos, 3% small-size shallow water fish, 7% medium-size shallow water fish, 4% large-size shallow water fish, 24% small-size pelagic fish, 17% small-size demersal fish, 0.01% *Phycis phycis* and 10% *Pagellus bogaraveo*. From this original diet composition, 4% was taken from both the small-size demersal and small-size pelagic fish and distributed evenly among the single species groups *Helicolenus dactylopterus*, *Conger conger*, *Pontinus kuhlii*, *Pagrus pagrus*, *Beryx splendens*, *Beryx decadactylus*, *Mora moro* and *Raja clavata*.

* 1. **Deepwater sharks**

The deepwater shark species in this group are: *Centrophorus granulosus*, *Centrophorus squamosus*, *Centroscymnus coelolepis*, *Centroscymnus crepidater*, *Centroscymnus cryptacanthus*, *Dalatias licha*, *Deania calcea*, *Deania profundorum*, *Etmopterus pusillus*, *Galeus melastomus*, *Galeus murinus*, *Heptranchias perlo*, *Pseudotriakis microdon*, *Scymnodon obscurus*, *Etmopterus spinax*, *Etmopterus princeps* and *Squaliolus laticaudus*. *Centrophorus squamosus* is an important bycatch species for the bottom longline/handline and the recent drifting deepwater longline fisheries (Pham et al., 2013). *Centrophorus granulosus*, *Deania calcea, Deania profundorum*, *Dalatias licha* and *Etmopterus spinax* are also regular bycatch of the bottom longline/handline fishery. A Q/B of 3.57 year-1 was calculated for this group, and a P/Q value of 0.10 was taken from Darwall et al. (2010). EE was set to 0.95. The group is assumed to occupy the depth strata deeper than 500m within the model area, amounting to a habitat fraction area of 99.39%. Diet composition of the deepwater sharks was compiled from Guenette and Morato (2001) and literature review (Mauchline and Gordon, 1983; Cortés, 1999; Jakobdóttir, 2001; Dunn et al., 2010; Navarro et al., 2014). It consists of 50% of teleost fish (12.5% bathypelagics, 10% demersal and bathydemersal fish groups, 7.5% mesopelagics, 5% of pelagics and other single-species groups), 20% of cephalopods, 20% crustaceans (14% shrimps, 5% crabs, 1% other benthos) and 10% of chondrichthyens (5% benthic sharks and rays, 1.5% pelagic sharks, 0.5% *Raja clavata*, and 3% of cannibalism).

* 1. **Pelagic sharks**

The pelagic shark group is made up of the species *Lamna nasus*, *Alopias superciliosus*, *Hexanchus griseus*, *Isurus oxyrinchus*, *Prionace glauca* and *Sphyrna zygaena*. The blue shark (*Prionace glauca*) is the most important commercial species in this group and is caught by the pelagic longline fishery (Pham et al., 2013). The shortfin mako shark (*Isurus oxyrinchus*) and the smooth hammerhead shark (*Sphyrna zygaena*) are important bycatch species of the bottom longline/handline fishery. A Q/B of 2.68 year-1 was calculated for this group, and a P/Q value of 0.10 was taken from Darwall et al. (2010). EE was set to 0.95. The group is assumed to occupy the entire model area, the habitat fraction is thus set at 100%. Diet contents were compiled from Guenette and Morato (2001) and consist of 2% cephalopods, 7% small-size shallow water fish, 10 % medium-size shallow water fish, 44% small-size pelagic fish, 10 % medium-size pelagic fish, 10% mesopelagic fish, 1% bathypelagic fish and 11% small-size demersal fish.

* 1. **Tunas**

The tuna species that make up this group are: *Katsuwonus pelamis*, *Thunnus alalunga*, *Thunnus albacares*, *Thunnus obesus* and *Thunnus thynnus*. *Katsuwonus pelamis* is the most important commercial species caught in the Azores EEZ, and is caught by the pole and line fishery. *Thunnus obesus* is also a very important commercial species of this fishery (Pham et al., 2013). P/B and a Q/B were calculated for this species and equal 0.36 year-1 and 3.03 year-1. EE was set to 0.95. The group is assumed to occupy the entire model area, the habitat fraction area is thus set at 100%. Diet information was taken from Guenette and Morato (2001) and consists of 7% large-size and gelatinous zooplankton, 2% cephalopods, 1% other benthos, 69% small-size pelagic fish, 13% medium-size pelagic fish, 1% small-size demersal fish and 8% medium-size demersal fish.

* 1. **Turtles**

This group consists of the turtle species *Caretta caretta*, *Dermochelys coriacea* and *Chelonia mydas*. The loggerhead turtle is a regular bycatch species of the pelagic longline fishery (Pham et al., 2013). P/B and Q/B were taken from Morato et al., (2009) and were estimated at 0.15 year-1 and 3.50 year-1. The group is assumed to occupy the entire model area, the habitat fraction area is thus set at 100%. EE was set to 0.95. Diet information for turtles was taken from Guenette and Morato (2001) and consists of 94% large-size and gelatinous zooplankton (mainly gelatinous species), 1% cephalopods and 5% mesopelagic fish.

* 1. **Seabirds**

The seabirds group consists of the species: *Bulweria bulwerii*, Calonectris diomedea, *Larus michahellis*, *Puffinus assimilis*, *Puffinus puffinus*, *Oceanodroma castro*, *Sterna hirundo* and *Sterna dougallii*. Biomass was calculated from the numbers of pairs reported in Monteiro et al. (1996a; 1999) multiplied by the body weight (Monteiro et al., 1996b) and the number of days they are present in the Azores (Monteiro et al., 1996a). P/B and Q/B for this group were taken from Guenette and Morato (2001) and equal 0.25 and 84.39 year-1. The group is assumed to occupy the entire model area, the habitat fraction area is thus set at 100%. Also diet information was taken from Guenette and Morato (2001) and consists of 3% small-size zooplankton, 1% large-size and gelatinous zooplankton, 4% shrimps, 4% crabs, 20% cephalopods, 44% small-size pelagic fish, 18% mesopelagic fish and 6% small-size demersal fish.

* 1. **Dolphins**

The dolphin group contains the cetacean species *Globicephala melas*, *Globicephala macrorhynchus*, *Delphinus delphis*, *Stenella coeruleoalba*, *Stenella frontalis*, *Hyperoodon ampullatus*, *Tursiops truncatus*, *Grampus griseus*, *Ziphius cavirostris*, *Mesoplodon bidens* and *Mesoplodon europaeus*. There are no records of marine mammal bycatch in the Azores fisheries (Silva et al., 2010). P/B and Q/B for this group were taken from Guenette and Morato (2001) and equal 0.10 and 11.41 year-1. The group is assumed to occupy the entire model area, the habitat fraction area is thus set at 100%. Diet information for the dolphins was compiled from Guenette and Morato (2001) and was assumed to consist of: 6% shrimps, 20% cephalopods, 1% crabs, 2% other benthos, 30% small-size pelagic fish, 5% medium-size pelagic fish, 16% mesopelagic fish and 20 % small-size demersal fish.

* 1. **Baleen whales**

The group of the baleen whales consists of the species *Balaenoptera acutorostrata*, *Balaenoptera borealis*, *Balaenoptera musculus*, *Balaenoptera physalus* and *Megaptera novaeangliae*. A P/B and a Q/B for this species were taken from Guenette and Morato (2001) and equal 0.06 year-1 and 5.56 year-1. The group is assumed to occupy the entire model area, the habitat fraction area is thus set at 100%. Diet information was taken from Guenette and Morato (2001) and consists of 25% small-size zooplankton, 65% large-size and gelatinous zooplankton, 5% small-size pelagic fish and 5% mesopelagic fish.

* 1. **Toothed whales**

The top predator toothed whale group consists of the species *Orcinus orca*, *Pseudorca crassidens*, *Globicephala* spp., *Hyperoodon ampullatus*, *Mesoplodon europaeus*, *Mesoplodon bidens*, and *Physeter macrocephalus*. A P/B of 0.02 and a Q/B of 10.27 was taken from Morato et al. (2009). The group is assumed to occupy the entire model area, the habitat fraction area is thus set at 100%. Diet information was taken from Guenette and Morato (2001) and is estimated to contain 2% large-size and gelatinous zooplankton, 75% cephalopods and 23% mesopelagic fish. This initial diet matrix was changed to include 2% pelagic sharks, 3% tunas, 1% turtles, 1% seabirds and 2% dolphins. The diet percentages were reallocated from mesopelagics (3%) and from cephalopods (6%).

* 1. **Detritus**

Biomass for the detritus group, which comprises of both dissolved and particulate organic matters, was guesstimated by Guenette and Morato (2001) at 1 t·km-2. Detritus is assumed to occupy the entire model area, the habitat fraction area is thus set at 1.

1. **References**

Afonso, P., J. Fontes, T. Morato, K. Holland and R.S. Santos (2008a). Reproduction and spawning habitat of white trevally, *Pseudocaranx dentex*, in the Azores, central north Atlantic. *Scientia Marina* 72(2), 373-381. http://dx.doi.org/10.3989/scimar.2008.72n2373

Afonso, P., T. Morato and R.S. Santos (2008b). Spatial patterns in reproductive traits of the temperate parrotfish Sparisoma cretense. *Fisheries Research* 90, 92-99. http://dx.doi.org/10.1016/j.fishres.2007.09.029

Barreiros, J.P., T. Morato, R. S. Santos & A. E. Borba (2003). Inter-annual changes in the diet of the almaco jack *Seriola rivoliana* (Perciformes: Carangidae) from the Azores. *Cybium* 27(1), 37-40.

Bon de Sousa, J. (2012). Modelling the effect of fishing on Condor seamount, Portugal. Master of Science in Oceanography, University of the Azores.

Braga-Henriques, A., Porteiro, F.M., Ribeiro, P.A., Matos, V.D., Sampaio, Í., Ocaña, O. and Santos, R.S. (2013). Diversity, distribution and spatial structure of the cold-water coral fauna of the Azores (NE Atlantic). *Biogeosciences*, 10(6), pp.4009-4036.

Clarke, M. R., Martins, H. R., and Pascoe, P., (1993). The diet of sperm whales (Physeter macrocephalus Linnaeus 1758) off the Azores. *Philosophical Transactions of the Royal Society of London. Series B: Biological Sciences*, 339(1287), 67-82.

Costa, R. (2007), Reproduction, age and growth of four coastal fish species in the NE Atlantic. MSc thesis, University of the Algarve.

D’Udekem D’Acoz, C., Pinho, M. R., Melo, O., Martins, H. R. (2001). New records and notes on little known shrimps (crustacea, decapoda) from Azorean waters. *Arquipélago, Life and Marine Sciences* 18A, 61-64.

Darwall, W. R. T., Allison, E. H., Turner, G. F., and Irvine, K. (2010). Lake of flies, or lake of fish? A trophic model of Lake Malawi. *Ecological Modelling*, 221(4), 713-727. doi:10.1016/j.ecolmodel.2009.11.001.

De Girolamo, M., Gonçalves, J., Porto, S., Nunes, C., Inácio, M., Pinho, M., and Isidro, E. (2001). Relatório do cruzeiro CHACAÇO (NI Arquipélago, verão de 2011) para a prospeção do Caranguejo da fundura (*Chaceon affinis*) em torno da ilha do Faial, Açores. Projeto MARPROF ref. MAC/2/M065, Departamento de Oceanografia e Pescas, Universidade dos Açores, Horta.

Fasham, M.J.R., Platt, T., Irwin, B., Jones, K. (1985). Factors affecting the spatial pattern of the deep chlorophyll maximum in the region of the Azores Front. *Progress in Oceanography*, 14, 129−165.

Figueiredo, M., T. Morato, J.P. Barreiros, P. Afonso, R.S. Santos (2005). Feeding ecology of the white seabream, *Diplodus sargus*, and the ballan wrasse, *Labrus bergylta*, in the Azores. *Fisheries Research* 75(1-3): 107-119. http://dx.doi.org/10.1016/j.fishres.2005.04.013

Guenette, S., and Morato, T. (2001). The Azores Archipelago, 1997. Fish. Cent. Res. Rep. 9.4: 241-270.

Howell, K. L., Heymans, J. J., Gordon, J. D. M., Duncan, J., Ayers, M., and Jones, E. G. (2009). DEEPFISH Project: Applying an ecosystem approach to the sustainable management of deep-water fisheries. Part 1: Development of the Ecopath with Ecosim model. Scottish Association for Marine Science, Oban. U.K. Report no. 259a.

Lambardi, P., Santos, M., Santos, A., Carmo, V., Meneses, I., Loureiro, C., Sequeira, S., Gomes, S., Medeiros, A., Silva, A.F., Mendonça, A., Isidro, E., Menezes, G., Martins, A. (2011). Characterization of zooplankton communities. In: Giacomello E. & Menezes G. (Eds.), CONDOR Observatory for long-term study and monitoring of Azorean seamount ecosystems. Final Project Report. Arquivo DOP, Série Estudos Nº 1/2012, Pp. 62−70.

Mackinson, S. (1996). System definition and primary production. pp. 63-64. In: Mass-balance models of North-eastern Pacific ecosystems. Ed. by D. Pauly and V. Christensen. Fisheries Centre Research Report 4(1).

Martins, H. R., and Hargreaves, P. M., (1991). Shrimps of the families Pandalidae and Hippolytidae (Crustacea: Decapoda) caught in benthic traps off the Azores. *Arquipélago, Life and Marine Sciences* 9, 47-61.

Menezes, G., Sigler, M., Silva, H., and Pinho, M. (2006). Structure and zonation of demersal fish assemblages off the Azores Archipelago (mid-Atlantic). *Marine Ecology Progress Series*, 324, 241-260. doi:10.3354/meps324241.

Monteiro, L. R., Ramos, J. A., and Furness, R. W. 1996a. Past and present status and conservation of the seabirds breeding in the Azores Archipelago. *Biological Conservation*, 78:319-328.

Gomes, T. Morato, E. Sola, M.P. Grós, G. Menezes, M.R. Pinho (1998). Trophic relationships and feeding habits of demersal fishes from the Azores: importance to multispecies assessment. *ICES CM* 1998/O:7. 21pp.

Monteiro, L. R., Ramos, J. A., Furness, F. W., and del Nevo, A. J. (1996b). Movements, morphology, breeding, molt, diet and feeding of seabirds in the Azores. *Colonial Waterbirds*, 19:82-97.

Morato, T., and Pitcher, T. (2002). Challenges and problems in modelling seamount ecosystems and their fisheries. *ICES CM*, 2002/M8, 28pp.

Morato, T., Bulman, C., and Pitcher, T.J. (2009). Modelled effects of primary and secondary production enhancement by seamounts on local fish stocks. *Deep-Sea Research Part II*, 56(25), 2713-2719. Elsevier. doi:10.1016/j.dsr2.2008.12.029.

Morato, T., E. Solà, M. P. Grós, G. Menezes (2001). Feeding habits of two congener species of seabreams, *Pagellus bogaraveo* and *Pagellus acarne*, off the Azores (northeastern Atlantic) during spring of 1996 and 1997. *Bulletin of Marine Science* 69(3): 1073-1087.

Morato, T., E. Solà, M. P. Grós, G. Menezes (2003b). Diet of the two most common elasmobranchs in the bottom longline fishery of the Azores, northeastern Atlantic: thornback ray *Raja* cf. *clavata* and tope shark, *Galeorhinus galeus*. *Fishery Bulletin* 101(3): 590-602.

Morato, T., P. Afonso, P. Lourinho, R.D.M. Nash and R.S. Santos (2003a). Reproductive biology and recruitment of the white sea bream in the Azores. *Journal of Fish Biology* 63: 59–72. http://dx.doi.org/10.1046/j.1095-8649.2003.00129.x

Morato, T., R.S. Santos, P. Andrade (2000). Feeding habits, seasonal and ontogenetic diet shift of blacktail comber, *Serranus atricauda* (Pisces: Serranidae), from the Azores, Northeastern Atlantic. *Fisheries Research* 49(1): 51-60. http://dx.doi.org/10.1016/S0165-7836(00)00189-2

Morato, T., E. Solà, M. P. Grós, G. Menezes (1999). Diets of forkbeard (*Phycis phycis*) and conger eel (*Conger conger*) off the Azores during spring of 1996 and 1997. *Arquipélago: Life and Marine Science*s 17A: 51-64.

Neto A. (1997). Studies on algal communities of São Miguel, Azores (Doctoral thesis). Universidade dos Açores, Ponta Delgada.

Neto, A. (2001). Macroalgal species diversity and biomass of subtidal communities of São Miguel (Azores). *Helgoland Marine Research*, 55(2), 101-111.

Neves, A., Sequeira, V., Paiva, R.B., Vieira, A.R. and Gordo, L.S. (2011). Feeding habits of the bluemouth, *Helicolenus* *dactylopterus dactylopterus* (Delaroche, 1809) (Pisces: Sebastidae) in the Portuguese coast. *Helgoland Marine Research*, 66(2), p.189.

Paula, J., Cartaxana, A., and Queiroga, H. (1992). Decapod crustaceans collected by the “Expedition Azores 1989”. *Arquipélago: Life and Marine Science*s 10, 67-74.

Pauly, D., and Christensen, V. (1995). Primary production required to sustain global fisheries. *Nature* 374, 255−257.

Pham, C. K., Canha, a., Diogo, H., Pereira, J. G., Prieto, R., and Morato, T. (2013). Total marine fishery catch for the Azores (1950-2010). *ICES Journal of Marine Science*, 70(3), 564-577. doi:10.1093/icesjms/fst024.

Santos, A.R., Trueman, C., Connolly, P. and Rogan, E. (2013b). Trophic ecology of black scabbardfish, *Aphanopus carbo* in the NE Atlantic—assessment through stomach content and stable isotope analyses. *Deep Sea Research Part I: Oceanographic Research Papers*, 77, pp.1-10.

Santos, M., Moita, M.T., Bashmachnikov, I., Menezes, G.M., Carmo, V., Loureiro, C.M., Mendonça, A., Silva, A.F., and Martins, A. (2013a). Phytoplankton variability and oceanographic conditions at Condor seamount, Azores (NE Atlantic). *Deep Sea Research Part II: Topical Studies in Oceanography*, 98, pp.52-62.