

## STRUCTURE AND DISTRIBUTION OF FISH AND CEPHALOPOD COMMUNITIES ON THE BURDWOOD BANK (SOUTHWEST ATLANTIC)

Paul Brickle<sup>1</sup>, Vladimir Laptikhovsky<sup>1</sup> & Alexander Arkhipkin<sup>1</sup>

<sup>1</sup> Falkland Islands Government Fisheries Department, PO Box 598, FIPASS, Stanley, Falkland Islands. (Tel: +500 27260, Fax: +500 27265)

Presenting author: Paul Brickle ([pbrickle@fisheries.gov.fk](mailto:pbrickle@fisheries.gov.fk))

The Burdwood Bank is an underwater plateau, with large shallows of less than 100 m deep, lying in the Southwest Atlantic between the western extremities of the Scotia Ridge and southern South America. The Burdwood Bank is in the path of the Antarctic Circumpolar Current and as a feature it gives rise to the Falklands Current. Surveys revealed that the Burdwood Bank has a rich fauna characterised by distinct assemblages structured by depth and hydrography.

The Burwood Bank is a large under water plateau situated in the South Atlantic between 53°30'S and 55°S and between the longitude of 55°W and 62°W. It lies between the western extremities of the Scotia Ridge and Southern South America. The Bank is in the path of the Antarctic Circumpolar Current and it gives rise to both branches of the Falklands Current. The area is characterised by an anticyclonic gyre which, in conjunction with its local hydrography results in unique fish and cephalopod communities. Stocks of rockcod (*Patagonotothen ramsayi*) and southern blue whiting (*Micromeisistius a. australis*) were targeted sporadically in the 60s and 70s by eastern European countries but the area was never fished intensively due to rough fishing grounds. Since the mid 1980's fishing activity has been restricted to sporadic longlining for the Patagonian toothfish (*Dissostichus eleginoides*) by two licensed fishing vessels. The Burdwood Bank is the only reproductive area of the species known in the Southwest Atlantic, and because of this the fishery here is prohibited during the spawning season. The western shelf area of the bank, which is situated in Argentinean waters, is a protected area for juvenile toothfish.

The aims of this study are to examine, in detail, the community structure of fish and cephalopod assemblages inhabiting the Burdwood Bank and the southern part of the Falklands shelf.

Data for this study were collected during research cruises on board the Falklands Islands Government's research vessel *RV Dorada* between September 2002 and July 2006. A total of 85 trawls were conducted using an ENGEL semi-pelagic net with 'Super-V' doors. The net had a 40.2 m headline and a 38.7 m footrope equipped with rockhoppers. Simrad ITI net monitor sensors were attached to the upper panel of the trawl. The net's vertical opening was between 6.9 and 17 m (mean = 11.50 m) and it had a codend mesh size of 95 mm. The net was typically towed at 4 kts.

Oceanographic data were collected using a logging CTDO (SBE-25, Sea-Bird Electronics Inc., Bellevue, USA) which was deployed from the surface to 1-20 m above the bottom to obtain profiles of temperature (°C), salinity (PSU), and dissolved oxygen (ml l<sup>-1</sup>).

On board fish and squids were identified to the lowest taxonomic level. Each species or taxa were weighed to the nearest gram to ensure accurate catch logs for

each station. Sub-samples finfish and rajids were measured ( $L_T$ ,  $L_{PA}$  and  $W_D$ ) to the nearest centimetre below and the sex and stage of maturity were recorded for all specimens sampled. Individual weights were recorded to the nearest gram using a POLS balance or, for larger specimens, to the nearest 20 grams using Scanvaegt balances. Cephalopods were analysed for length, sex, maturity and weight, with statoliths extracted from sub samples. Community structure was analysed using agglomerative hierarchical cluster analyses and multidimensional scaling (MDS). Prior to these analyses the CPUE data were log transformed ( $\log(n+1)$ ) as they were overdispersed as indicated by a high variance to mean ratio.

The study revealed 117 fish and 33 squid taxa on the Burdwood Bank and on the southern Falklands Shelf. Exploratory analyses using a cluster analyses with an average linkage and a Jaccard's measure of similarity (presence/absence) revealed four major fish and cephalopod assemblages occupying depths between 95 and 1119 m (Figure 1). These assemblages are structured by depth and by hydrographic features and reflect the existence of communities of different origin that inhabit Burdwood Bank. This is a region of high biodiversity that has so far successfully avoided human impact.

