



## Reef fish spawning aggregation studies at the University of Guam Marine Laboratory

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Studies of reef fish spawning aggregations by members of the University of Guam Marine Laboratory, in collaboration with other institutions, continue throughout the western Pacific region. University of Guam Marine Laboratory (UOGML) graduate student, Peter Dixon, is investigating spawning aggregations of *Epinephelus polyphkadion* and *Plectropomus areolatus* in Palau and Federated States of Micronesia (Pohnpei). His work, funded by a US Sea Grant award to Dr Mark Tupper (Palau International Coral Reef Center and UOGML), utilizes acoustic tracking methods to investigate grouper catchment distances, migratory routes, spawning dynamics, and periodicity of aggregations. In 2004, 27 *E. polyphkadion* and three *P. areolatus* were tagged with coded Vemco V16 transmitters at Ulong Channel in Palau. The tagged fish were monitored using an array of nine Vemco VR2 receivers, and were also tracked actively with Vemco hydrophones. In April 2005, an additional 50 *P. areolatus* (25 male, 25 female) were tagged at Ulong Channel. These fish will be monitored over the course of the spawning season and into 2006. In Pohnpei, in a collaborative effort with Dr Kevin Rhodes, 40 *P. areolatus* (20 male, 20 female) were tagged in January and February 2005 at an aggregation site within the Kehpera Marine Sanctuary. These fish will be monitored over the next year. Dixon's thesis work, which is being supervised by Dr Donaldson, should be available by June 2006.

A preliminary assessment of reef fish spawning aggregations and sites at remote locations in Milne Bay Province, Papua New Guinea, was undertaken in March 2005 with funding from the National Geographic Society, UOGML, and the Coral Reef Research Foundation (CRRF, Palau). Dr Terry Donaldson (UOGML) was joined by Dr Patrick Colin (CRRF), Martin Russell (Great Barrier Reef Marine Park Authority, Australia), Dr Michael Domeier (Phleger Institute for Environmental Research – PIER, California USA), and Bonnie Domeier (PIER) for a survey conducted aboard the MV *Chertan*, a live-aboard dive vessel under the

command of Captain Rob van der Loos. The team surveyed a number of remote reefs, both offshore and in the vicinity of the East Cape. Divers employed towed geographical positioning system (GPS) tracking buoys as they mapped habitats and counted fish at aggregation sites. A GPS-linked fathometer was also employed to map benthic structure at these sites. Team members utilized digital cameras and video cameras to record fish behaviour, as well. Work on the offshore reefs, however, was cut short by the threat of Cyclone Ingrid. The team plans to return again in 2006.

Donaldson continues to collaborate with Colin on related studies in Palau that utilize GPS technology in the quantitative assessment of reef fish spawning aggregations. This collaboration is now in its third year and focuses upon spawning aggregation dynamics, physical and oceanographic characteristics of sites, reproductive behaviour (including lekking — the behaviour associated with a temporary aggregation of sexually-active males for the purpose of reproduction), and egg and larval transport. This work has been funded by CRRF and The Nature Conservancy. Some of the methods employed in this study were the subject of a recent paper, co-authored by Colin, Donaldson and Dr Laura Martin (CRRF), and delivered by Colin at the 7<sup>th</sup> Indo-Pacific Fish Conference held in Taipei, Taiwan, in May 2005.<sup>2</sup>

Later this year, Donaldson will also conduct preliminary assessments of spawning aggregation sites in Vietnam and northern Palawan, Philippines, with funding from the US National Oceanographic and Atmospheric Administration.



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2. Colin P.L., Donaldson T.J. and Martin L.E. 2005. A new method for quantitatively assessing reef fish spawning aggregations and other populations of reef fishes. Abstract S9–10, p. 56. 7th Indo-Pacific Fish Conference, May 16–20 2005, Taipei, Taiwan.