AIMS Communication - PMB No 3, Townsville MC, QLD, 4810 Australia
Phone +61 7 4753 4265 or 0418 729 265

Embargo: 9:00pm (Australian Eastern Daylight Time) 3rd February 2016

Most vulnerable tropical reef fish identified in new study

In a world where fish biodiversity is on the decline, highly vulnerable species are given a major boost today after scientists identified why some species are absent from reefs in the Indian and Pacific oceans. Incorporating this knowledge into conservation strategies will help to reduce human impact on species loss.

The findings are the result of an international collaboration involving a large team of scientists who together produced one of the world's most extensive datasets of reef fishes. By analysing almost 10,000 records from more than 900 locations, the team was able to identify specific types of fishes that are most vulnerable to direct human impacts and climate change.

"Our analysis of 241 fish species showed that larger-bodied fish, especially those with smaller geographic ranges, are particularly vulnerable," explains lead author, Dr Camille Mellin, from the Australian Institute of Marine Science and the University of Adelaide's Environment Institute. "In fact, these species are 67% less likely to occur where human impact and shifting seasonal temperatures exceed critical thresholds.

"Surprisingly, these types of fish actually occur less commonly on reefs in the Coral Triangle which is a very well-known marine biodiversity hotspot.

"In the Coral Triangle, coral reefs tend to be highly affected by human activity, such as fishing and urban development, in contrast to the less-impacted reefs in New Caledonia or on the Great Barrier Reef that tend to host more of these large, small-ranging fish species."

"Although these fish represent only 7% of all the species the team examined, they often provide unique and important functions on the reef", as explained by study co-author, Dr David Mouillot, from the Marine Systems Ecology Lab in Montpellier, France:

"Several large parrotfish have smaller geographical ranges than average and may play important roles in preventing reefs shifting from coral to algae. In some regions, these species are heavily fished, in particular the steephead parrotfish which is generally found in high densities across its range but has become rare in the Philippines and nowadays is infrequently found in markets in the Coral Triangle region."

"Larger bodied fishes have slower growth rates, and tend to naturally occur at lower abundances meaning they tend to be even more vulnerable to fishing and habitat loss. They are also more sensitive to climate-induced changes in seasonal events and are likely to recover more slowly", says Dr Julian Caley from the Australian Institute of Marine Science.

"For example, spring temperatures trigger spawning aggregations in coral trout, but if temperature shifts mean spawning occurs when conditions are unfavourable for larvae to survive and grow, this can have a negative effect on their population," he says.

These findings highlight the need to focus on these at-risk species, and pay particular attention to management in relation to the traits that make them vulnerable. This paper also highlights the importance of monitoring programs in providing the knowledge needed for managing these valuable living resources and assessing their responses to management interventions.

The paper "Humans and seasonal climate variability threaten large-bodied coral reef fish with small ranges" by C. Mellin, D. Mouillot, M. Kulbicki, T. McClanahan, L. Vigliola, C. Bradshaw, R. Brainard, P. Chabanet, G. Edgar, D. Fordham, A. Friedlander, V. Parravicini, A. Sequeira, R. Stuart-Smith, L. Wantiez and J. Caley appears in the journal *Nature Communications* (contact AIMS Media for access to manuscript and high resolution images).

Further information please contact:
Dr. M. Julian Caley
AIMS Senior Principal Research Scientist
j.caley@aims.gov.au
Telephone: +61 7 4753 4148

AIMS media contact:
Steve Clarke, +61 (0)7 4753 4264; +61 (0) 419 668 497 or S.Clarke@aims.gov.au