



Early morning fishing at El Nido, Philippines.
Photo: T. Gilliland

PROGRESS UPDATE

COMPONENT I

Quantifying the value and market potential of coral reef and mangrove ecosystem services

ACTIVITY

Marine spatial planning and marine reserve network design activities

OBJECTIVE

To expand the FISH-BE model to consider the health of mangrove, seagrass, and coral reef habitats, tourism and coastal land use changes in a spatially explicit form, to inform fisheries management, marine reserve network design, and marine spatial planning

Catch of the day, El Nido.
Photo: T. Gilliland



INFORMING FISHERIES MANAGEMENT AND MARINE SPATIAL PLANNING

Overview

The Fisheries Information for Sustainable Harvests Bio-Economic (FISH-BE) model was a decision-support tool designed to facilitate examination of different fisheries management options to alleviate the effects of high fishing pressure.

This tool, originally developed by researchers from the University of the Philippines Marine Science Institute (UP MSI) and De La Salle University (DLSU), was designed for decision-makers and natural resource managers to help them with planning and management. Scenarios can be created to determine suitable management options, based on changes in reserve size, numbers of fishers, number of fishing days and catch per fisher. The tool can also provide estimates on costs and returns of MPA management, both to fishers and to the local government (Licuanan, 2006).

The spatially explicit version of FISH-BE being developed by CCRES aims to guide marine reserve network design and marine spatial planning by demonstrating potential fisheries productivity given varying levels of habitat quality, fishing pressure and

protection. This new version also considers the effect of larval connectivity (the connection of marine populations through larval dispersal), and land-based threats on fish population growth. It will allow more informed decisions to be made by planners and natural resource managers when considering questions related to marine and coastal ecosystem protection and fishing regulations.

Progress

The goal of CCRES is to develop a tool that could be used by planners and natural resource managers to help them decide on different management options by using different scenarios. By using the spatially explicit FISH-BE model, planners and managers will be able to experiment with different features, such as habitat quality, fishing pressure and protection, to be able to describe changes in fisheries productivity.

Other optional features of the tool include the effects of connectivity and sedimentation on fisheries. The connectivity feature built into the tool could support the growth parameters in FISH-BE. Sedimentation on the other



hand, represents a land-based threat that causes degradation of coral reefs, consequently affecting fish populations.

In the past year, CCRES has been working on the features and data that can be used in the model. In June 2015, we had a workshop with our collaborators from the University of Queensland to discuss the objectives and features of FISH-BE. We also worked with project partners from Palawan Council for Sustainable Development (PCSD), Palawan State University (PSU) and University of California, Davis (UCD), to gather data that will be used. We obtained datasets from PCSD, and collaborated with PSU and UCD to gather recent fisheries information.

A series of household surveys was conducted from April to May 2015 in El Nido, Palawan (ref Progress Update #2 Bio-LEWIE modelling project). From these surveys, we could estimate catch composition, catch rates, and catch per unit area for the study area. The surveys have also enabled CCRES to obtain information on favoured fishing grounds, which can help determine certain factors that affect fishing behaviour.

The latest version of FISH-BE can now demonstrate changes in fisheries productivity in a fished scenario. It can

Sorting the nets, El Nido.

Photo: M. King

also simulate changes in fish standing stock biomass and spillover for two habitat types — coral reef ecosystems (to represent reef fisheries), and open water systems (to represent pelagic fisheries).

The tool was first presented at the Philippines Association of Marine Science Symposium held in General Santos City, Philippines in October 2015. From this forum we obtained valuable information and feedback from fish biologists and fisheries experts, to help us address some of the challenges with fisheries modeling.

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El Nido reef.

Photo: C. Castro



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Capturing Coral Reef and Related Ecosystem Services (CCRES) is a regional technical support project that seeks to unlock new, sustainable income streams for coastal communities in the East Asia-Pacific region.

CCRES will develop knowledge products — which inform the design of global, regional and national projects, plans and policies — and technical models and planning tools which assist with preparation of community-based coastal resource management plans.

