

MESM 2014-2015 Group Project Proposal

A Decision Support Framework for Designing Territorial Use Rights for Fishing

Proposers:

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Client Contact: Sarah Poon, (415) 293-6125, spoon@edf.org, www.edf.org

Faculty Sponsor(s):

Steve Gaines, Bren School Dean

Christopher Costello, Bren School Professor of Resource Economics

PROPOSED PROJECT

Project Objectives:

Overfishing threatens the livelihoods and food security of billions of people around the world, but catch shares and other forms of rights-based fisheries management offer a promising solution. By giving fishermen a secure, long-term stake in their fishery, these programs incentivize stewardship and empower fishermen to improve their livelihoods (Castilla and Gelcich, 2008; Sosa-Cordero et al., 2008; McCay et al., 2014). Territorial Use Rights for Fishing (or TURFs), in which fishermen have exclusive access to defined fishing areas, is a steadily growing approach to sustainable management of nearshore, small-scale fisheries worldwide. As fishery managers and fishing communities around the world develop new TURFs, they will need access to resources and tools to help them weigh trade-offs between design options, including key species to manage and the location of boundaries. While a wealth of scientific information and marine spatial planning tools exists, many nearshore artisanal fisheries are located in isolated areas and/or developing nations where access to scientific data is limited and use of highly technological spatial planning tools is not feasible. As Environmental Defense Fund (EDF) and its partners work to promote thriving coastal fisheries, there is a critical need for a TURF design tool that incorporates the best available science and stakeholder input in a way that is appropriate for the small-scale fisheries context.

During this project, MESM students will:

1. Develop a comprehensive decision-making framework for TURF design based on relevant biological and social factors. The main output of this framework will be a clear trade-off analysis of different design options, including species managed in the TURF and potential boundaries (and, where applicable, the boundaries of no-take reserves), based on the spatial range and important habitats of target species, social and political characteristics, and other factors. The framework will integrate existing biological and social data (as determined by review of existing literature and data) that is readily available or easy to access. The format of the framework will be determined by the students, with the goal of being broadly applicable and easy to adapt.
2. Create a tool to deliver the framework that is relevant and accessible to multi-stakeholder TURF design groups in small-scale fisheries. Ongoing TURF implementation projects in the Philippines will guide the selection of the appropriate medium and interface for the tool, as well as a protocol for its use with stakeholders. The completed tool will be available to inform design decisions in 12 additional TURF sites in the Philippines in 2015. Lessons learned and best practices may be extrapolated for application to other TURF design projects.

Project Significance:

This project will provide valuable information and tools for an international effort to end overfishing and will focus specifically on nearshore, small-scale fisheries. Billions of people around the world depend on seafood as a primary source of protein, but overfishing threatens the wild fish stocks on which they rely (FAO, 2012). Governments and numerous organizations around the world, including Environmental Defense Fund (EDF), have recently set a goal to ensure 50% of global fisheries are sustainably managed in ten years (50in10.org). TURFs provide structure and incentives for nearshore fishermen and fishery managers to co-manage their resources sustainably, and programs have demonstrated significant success towards curbing overfishing in coastal communities around the world (Castilla and Gelcich, 2008; Sosa-Cordero et al., 2008; McCay et al., 2014). Increasingly, TURFs are being used in conjunction with no-take marine reserves (“TURF-Reserves”). This pairing allows fishermen who have exclusive access to the TURF to benefit from spillover of fish stocks from reserves and, in return, creates greater incentive to respect the reserve.

The effectiveness of TURF-Reserves in meeting defined goals relies on design. Stakeholders designing TURFs are faced with technical decisions, such as which species to manage in the TURF and where boundaries should be located. These decisions depend on a variety of factors, including the species targeted, fishing behavior, local ecological characteristics, and complex social factors such as the way fishermen are organized (Poon and Bonzon, 2013). There is a need for an integrated decision-making framework and tool that local site managers may use to weigh trade-offs and make design decisions based on available biological/ecological data and socioeconomic factors. The way stakeholders can use this tool and engage in the design process depends on social factors including bottom-up versus top-down decision-making and governance, culture, education, access to technology, etc. This integrated TURF-Reserve design tool will support implementation of this fishery management approach-by providing a simple, accessible framework for fishermen, fishery managers, scientists, and other stakeholders to define TURF-Reserve boundaries.

Background:

Creation of a TURF-Reserve design tool has direct relevance to EDF’s ongoing global projects in southeast Asia, the Caribbean, Latin America, and Europe. In particular, this tool will provide design support for coastal communities engaged in Fish Forever: a global initiative pursued jointly by Rare, UCSB’s Sustainable Fisheries Group (SFG), and EDF. Fish Forever aims to transform nearshore small-scale fisheries in the developing world by empowering fishing communities to manage their fisheries sustainably through TURF-Reserves. This group project will strengthen the impact of this initiative by providing TURF-Reserve implementers at Fish Forever sites with an accessible tool to ensure design decisions are based on best practices. During the group project period, Fish Forever will be actively engaged in TURF-Reserve design and implementation in four sites in the Philippines, with additional sites launching projects shortly thereafter. This group project will thereby have immediate relevance to ongoing efforts to improve fisheries management. Furthermore, this tool and lessons learned will be applicable and available to the broader community of TURF-Reserve implementers around the world.

This project will build upon an existing body of knowledge on TURF-Reserve design to fill a critical gap. EDF’s Catch Share Design Manual (Bonzon et al., 2013) and associated volume on TURFs (Poon and Bonzon, 2013) are the most comprehensive guides currently available to practitioners interested in designing and implementing TURFs. The manuals draw from theoretical literature and practical experiences with catch shares (including TURFs) around the world to provide step-by-step design guidance. Existing and ongoing research, particularly by UCSB’s Sustainable Fisheries Group, provides additional quantitative data that can be integrated with the best practices outlined in EDF’s design manual to provide the specific guidance stakeholders need to define boundaries and other design parameters to achieve their goals. Furthermore, while there is a wealth of case studies, research, and design tools for no-take reserves, there remains a need for a tool that integrates TURF and reserve design considerations.

Possible Approaches and Available Data:***Objective 1:***

To determine the key inputs for the design decision framework, the group will execute background research on best practices and existing data to assess the impact and importance of different factors on the species managed in the TURF,

TURF (and reserve) size and location, and other relevant attributes. These data are widely available from EDF, SFG, and other sources as listed below. From this research, the group will translate data and information into a practical decision making framework. The framework will allow decision makers to weigh trade-offs between design options based on the characteristics of the fishery, such as important fishing areas, movement patterns of target species, number of fishermen, and the location of key habitats. To the extent practical, the framework will also provide for customization to account for local implementation considerations, such as decision-making protocols, governance, and enforcement structure. The resulting decision making framework will allow stakeholders to weigh different design options in a manner much like Marine Map was used for California's Marine Life Protection Act Initiative (Merrifield et al., 2013).

Resources and background data available to the group include:

- Design considerations and best practices from EDF's Catch Share Design Manual volume on TURFs
- Relevant data and scientific guidelines from the Sustainable Fisheries Group (SFG), including model outputs of optimal TURF sizes for commonly fished species
- Success factors from the 2013 TURF group project (An Analysis of Territorial Use Rights Fisheries to Determine Appropriate Contexts for Implementation, Bren School 2014)
- Existing reserve design guidance, such as the Coral Triangle Initiative's MPA Practitioner Guide (Green et al., 2013)

Objective 2:

The decision tool will be made deliverable through different types of media, including media that are not reliant on internet access and advanced technological aptitude. The group will assess a set of tools/media available to decision makers ranging from comprehensive marine spatial planning tools like SeaSketch (seasketch.org), to less technologically-advanced tools. Based off of existing data and research, the group will perform a basic trade-off analysis to compare the level of scientific rigor, accessibility to audiences with different cultural and educational backgrounds, and cost of use of various tools.

The group will select and develop a communication and implementation medium for the decision-making framework for small-scale fisheries in the Philippines. The Philippines is an ideal region for this case study due to the country's inclusion in the Fish Forever project and its relative homogeneity in social and governance structure. During the group project period, four sites in the Philippines will be in the process of designing TURF-Reserves as part of Fish Forever. The group will have access to stakeholders and project leads for qualitative inputs and current practices from which they may build a practical tool to incorporate the new decision-making framework. The goal of the group will be to develop a tool that may be tested in the field with planned future Philippine TURF-Reserve projects. The result will provide a case study from which best practices may be drawn and built out for global applicability.

Deliverables:

This project's primary deliverables will include the decision-making framework and a stakeholder design tool for TURF-Reserve projects in the Philippines. EDF's needs will be best met by a framework that is as broadly applicable and customizable as possible, while the tool will serve as an example of how the framework can be customized for a specific context. The framework and tool may take on a range of media and may have the opportunity for testing in the field.

Internships:

EDF will host 1 paid summer internship at their office in San Francisco for a dedicated student to advance project research and engage with experts and stakeholders in relevant TURF implementation projects, particularly our Fish Forever work in the Philippines.

SUPPORTING MATERIALS

Budget and Justification:

The \$1,300 provided by Bren is expected to be sufficient budget to complete the project.

Client Letter of Support:

See attached letter from Sarah Poon, EDF

Key Stakeholder Letter of Support:

See attached letter from Michaela Clemence, SFG

References:

Bonzon, K., McIlwain, K., Strauss, C. K. and Van Leuvan, T. (2013). Catch Share Design Manual, *Volume 1: A Guide for Managers and Fishermen* (2nd ed.). Environmental Defense Fund.

Castilla, J.C. and Gelcich, S. (2008). Management of the loco (*Concholepas concholepas*) as a driver for self-governance of small-scale benthic fisheries in Chile. In R. Townsend and R. Shotton (Eds.), *Case studies in fisheries self-governance*. FAO Fisheries Technical Paper 504. Food and Agriculture Organization of the United Nations.

Food and Agriculture Organization of the United Nations (FAO). (2012). *State of the World Fisheries and Aquaculture 2012*.

Green, A., White, A. and Kilarski, S. (Eds.) (2013). Designing marine protected area networks to achieve fisheries, biodiversity, and climate change objectives in tropical ecosystems: a practitioner guide. The Nature Conservancy, and the USAID Coral Triangle Support Partnership, Cebu City, Philippines.

Gutierrez, N. L., Hilborn, R. and Defeo, O. (2011). Leadership, social capital and incentives promote successful fisheries. *Nature*, 470, 386-389.

McKay, B. J., Micheli, F., Ponce-Díaz, G., Murray, G., Shester, G., Ramirez-Sánchez, S., Weisman, W. (2014). Cooperatives, concessions, and co-management on the Pacific coast of Mexico. *Marine Policy*, 44: 49-59.

Merrifield, M. S., McClintock, W., Burt, C., Fox, E., Serpa, P., Steinback, C., Gleason, M. (2013). MarineMap: A web-based platform for collaborative marine protected area planning. *Ocean & Coastal Management*, 74: 67-76.

Poon, S. E. and Bonzon, K. (2013). *Catch Share Design Manual, Volume 3: Territorial Use Rights for Fishing*. Environmental Defense Fund.

Sosa-Cordero, E., Liceaga-Correa, M. L. A. and Seijo, J. C. (2008). The Punta Allen lobster fishery: current status and recent trends. In R. Townsend, R. Shotton and H. Uchida (Eds.), *Case studies in fisheries self-governance*. FAO Fisheries Technical Paper 504. Food and Agriculture Organization of the United Nations.

Environmental Defense Fund
123 Mission Street, 28th Floor
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January 24, 2014

Bren School of Environmental Science and Management
2400 Bren Hall
University of California, Santa Barbara, CA 93106-5131

Dear Bren Group Project Proposal Selection Committee:

I am excited to propose this Bren 2014-2015 Group Project, *A Decision Support Framework for Designing Territorial Use Rights for Fishing*, on behalf of Environmental Defense Fund (EDF). This project will support EDF in our mission to restore the health of the world's fisheries through responsible management by providing a practical tool to support Territorial Use Rights for Fishing (TURF) implementation.

EDF has developed leading expertise in catch shares through research and experience working in fisheries in the U.S. and internationally. Our Catch Share Design Center provides resources, training, and guidance to fishery managers and fishermen around the world to promote effective catch share design. As we work to broaden our reach to more fisheries around the world (as in our Fish Forever partnership with Rare and the Sustainable Fisheries Group), it is essential that we continue to build up a comprehensive toolkit for fishery managers, fishermen, and other stakeholders. The decision framework and tool proposed will help eliminate some of scientific and technical barriers that pose challenges to TURF implementation in small-scale fisheries. The framework will complement our existing toolkit (catchshares.edf.org) and other resources we and our partners are developing.

EDF is committed to ensuring the success of this project, both to meet our objectives and to support a positive and enriching experience for the students involved. EDF will provide advisement and guidance to the MESM students on a regular basis, share our expertise and relevant resources, and connect the students to other experts. We will foster communication between the MESM students and appropriate contacts working on TURF design and implementation in the Philippines to support project objectives. We will host a paid summer internship for one of the students in our San Francisco office to work closely with members of our Catch Share Design Center and Fish Forever teams. The intern will have the opportunity to deepen their TURF expertise and connect with our staff and partners in the Philippines to support the development of the TURF design framework and tool.

We expect the outcomes of this project to be incredibly useful for stakeholders in the Philippines and around the world to promote sustainability in the fisheries they depend on. Furthermore, I think the project would be a great opportunity for Bren students to develop a creative and practical solution to a pressing global environmental issue. I hope to have the opportunity to support them in doing so!

Sincerely,

A handwritten signature in black ink that reads 'Sarah E. Poon'. The signature is written in a cursive, flowing style.

Sarah E. Poon, MESM 2011
Senior Specialist – Training & Design, Catch Share Design Center
Environmental Defense Fund

Sustainable Fisheries Group
University of California Santa Barbara
Santa Barbara, CA 93106-5131



January 23, 2014

Bren School of Environmental Science and Management
2400 Bren Hall
University of California, Santa Barbara, CA 93106-5131

Dear Bren Group Project Proposal Selection Committee:

On behalf of the Sustainable Fisheries Group (SFG), I am pleased to provide this letter in support of the Bren 2014-2015 Group Project Proposal, A Decision Support Framework for Designing Territorial Use Rights for Fishing. SFG is excited about the goals of this project and the valuable applications of its results. To support the project, SFG will provide relevant data and scientific guidelines on TURF and reserve design, such as modeling outputs of optimal TURF and marine reserve sizes for commonly fished species in nearshore tropical reef fisheries, as well as provide ongoing guidance and resources that will help the students achieve meaningful results.

The proposed project will provide valuable information and tools to inform an international effort to end overfishing called Fish Forever. A global partnership between SFG, Rare and EDF, Fish Forever aims to transform nearshore small-scale fisheries in the developing world by implementing Territorial Use Rights for Fishing (TURFs) combined with marine reserves. The goal of Fish Forever is to empower coastal communities to sustainably manage their own marine resources, resulting in productive and profitable fisheries, improved lives and livelihoods and ecosystem conservation and resilience.

SFG applies expertise in bioeconomic and spatial modeling and fisheries science and assessment to inform sustainable fisheries management practices, including TURF-Reserve design. As we and our partners work to transform fisheries at a global scale, we draw from our current knowledge in TURF and reserve design but will require additional tools to reach our goals. While there is a wealth of information regarding biological, socio-economic and governance considerations in TURF and reserve design, there is a dearth of practical tools and frameworks that communities can use to synthesize available scientific information to guide decisions on TURF-Reserve design and implementation.

This proposed Bren project will help bridge this disconnect, and we expect project outputs to be valuable for our work in Fish Forever in particular, as well as other work by SFG and partners in improving the ability of communities to make informed decisions about their marine resources.

SFG hopes to see this project move forward, both for the valuable information it will provide and for the opportunity it presents for the students to engage in this important environmental issue.

Sincerely,

A handwritten signature in cursive script that reads "Michaela Clemence".

Michaela Clemence, MESM 2011
Project Manager, Sustainable Fisheries Group