

# Coral Reef Targeted Research and Capacity Building for Management

## Connectivity Program

The Fourth Training Workshop  
on Connectivity, Recruitment, and Protected Area Management on the  
Mesoamerican Reef

April 25-27, 2007, Anthony's Key Resort  
Roatan, Honduras

## Summary Report



UNITED NATIONS  
UNIVERSITY

UNU-INWEH



The Nature  
Conservancy.   
SAVING THE LAST GREAT PLACES ON EARTH

## **Summary and Outcome of the Workshop**

The 2007 Training Workshop on monitoring of recruitment was slightly different from the three prior training workshops in that it was broader in focus and aimed more at using monitoring data in management. It was attended by a combination of managers and NGO Personnel as well as members of the Connectivity program. The Training Workshop was held from 25-27 April, 2007 in Roatan, Honduras, where we made use of the facilities and able logistic support of Anthony's Key Resort.

Accommodation was arranged for all participants at the Sea Grape Plantation Hotel, meal plans were arranged at Anthony's Key Resort as well as with local restaurants, and Anthony's Key Resort provided diving support services. We thank Grupo Planeta Azul for the logistic arrangements for the workshop.

The Training Workshop was attended by 18 participants and implemented by an instructor team comprising Dr. Mark Butler, Old Dominion University, Dr. Ken Lindeman, Florida Institute of Technology, Dr. Peter Sale, UNU-INWEH & University of Windsor, Dr. Robert Steneck, University of Maine, Dr. Nestor Windevoxhel, TNC – Mesoamerican Reef Program, Guatemala and Ms. Hanneke Van Lavieren, UNU-INWEH. The workshop was conducted primarily in English. The agenda, the list of participants and the questionnaire are attached as Annex 1, 2 and 3 to this report.

The morning of Day 1 started with a welcome by Dr. Peter Sale and introductions by all participants followed by a short presentation - "Connectivity, Recruitment, and Management of MPAs" - by Dr. Sale. A summary of the responses to the questionnaire sent to the participants prior to the workshop (Annex 2) was presented by Ms. Van Lavieren. Most respondents were familiar with connectivity and recruitment issues and their importance for MPA management, however most had never used this information in any of their management decisions due to lack of useful data/information as well as lack of government support. Some other comments made by the respondents with regards to the workshop included the importance of information-sharing aspects of the project; the need for some practical and useful outputs of this workshop as well as the need for an improved link between science and management. The morning ended with a discussion – on what MPAs are for, how they should be designed and managed and if and how recruitment and connectivity data should be used to guide management tasks.

The afternoon of Day 1 was devoted to a presentation - "Recruitment dynamics in corals – short larval lives and difficulty finding places to live" - by Dr. Steneck, followed by a discussion on coral recruitment and management needs. This was followed by a presentation by Dr. Lindeman – "Juvenile habitat shifts and management requirements in reef fishes". Dr. Lindeman gave some coastal management examples from Florida and Mexico to illustrate the influences of coastal development, (bad) EIAs, and (instant) mass tourism. Dr. Lindeman then asked the participants to illustrate some of the management challenges that involve demersal connectivity in their areas.

The morning of Day 2 continued on the topic of connectivity and recruitment dynamics in fish. Dr. Sale presented "Larval dispersal: theory and data from the region". This was followed by Dr. Butler who gave a presentation – "Recruitment dynamics in lobster: long larval lives and many

life stages”. Dr. Butler suggested that the CRTR project could provide managers with specific training in lobster recruitment monitoring, and that post-larval recruitment data could be used to validate models of lobster dispersal and connectivity. This session ended with a discussion on lobster recruitment and management needs. The afternoon of Day 2 was devoted to a dive opportunity in Roatan MPA and ended with a presentation by Dr. A. Arrivillaga of TNC titled “Connectivity and MPA networks: Using the eco-regional planning process”.

Day 3 commenced with a presentation on the abundance trend in Nassau grouper at the Glovers Reef spawning aggregation and the impact of MPA establishment by Dr. Sale. This was a presentation that had been prepared by Dr. E. Salas, based on his research on the Glovers Reef population. Following discussion of this, a broader discussion focused on local benefits of regional collaboration in planning and monitoring. Dr. Butler then led a discussion on larval connectivity and how to use this in management. He discussed the different scales at which management of corals, fish and lobsters will be influenced by their dispersal, migration and settlement strategies.

The final discussion session was led by Dr. Lindeman and focused on how to improve sustainable management programs for regional coral reefs. Following the agenda, he asked the participants to identify the 5 first steps to take for this, and followed with some comments on what the Connectivity Program could do to aid local managers, and what could managers could do themselves to improve the sustainability of our reefs. The following specific steps were suggested by the participants:

1. Ensure actions that implement enforcement of existing regulations
2. Communicate science more effectively (a great strategy – what are the actions? They begin with:
  - build trust via “breaking of bread” – that is, deal one on one with fishing leaders on their turf – the docks and the local restaurants over meals in informal settings. With such trust-building, both sides will penetrate their messages better.
  - better outreach materials from governments and NGOs
  - bring more fisheries agency people to our workshops
3. Include more local scientists
4. Provide alternative livelihoods to fishers

### **What can we do for managers?**

1. Information dissemination:
  - Send them significant pdf’s, or post on server or ftp site for them to access
  - send them 2-page summaries of particular topics
  - Perhaps TNC can post these in suitable place?
  - A Targeted Research listserv, perhaps under TNC site, could service these needs
  - Review articles will facilitate
2. Ensure other TR working groups inform us of their meetings in the region
3. In future workshops, bring in some major non-traditional actors, and use media to get the word spread more widely.
  - use locals to organize the local actors
4. We can speak on our own time

### **What can managers do?**

1. Managers should bring scientists and fishers together to “break bread”
2. stop scaring fishermen; educate them earlier (they won’t scare as easy later)

During the discussions of the workshop, the following subjects were raised: importance of working closely with other managers in the region; financial issues for managing MPAs; lack of connectivity and recruitment data available for management; the need for clear messages; importance of networking and building partnerships and the importance of law enforcement.

A number of good suggestions resulted from the discussions, and these will be followed up over future months.

### **Future workshops**

No final decision has been made on the location, timing or the topic of the next workshop, but it is planned for 2008.

## ANNEX 1

### Agenda

Tuesday 24 <sup>th</sup> April	Participants arrive Roatan and are transported to their hotel (Seagrape Plantation Hotel)
1700 hr	Informal welcome reception (at Lands End, by the pool)
1900hr	Dinner at Lands End
Wednesday 25 <sup>th</sup> April	
0830hr	Welcome to workshop, Introductions, Goals for this Workshop
0845hr	Connectivity, Recruitment, and Management of MPAs. (Peter Sale)
0915hr	Summary of concerns from participants. (Hanneke van Lavieren)
0930hr	Discussion – What are MPAs for? How should we design and manage them? Should recruitment and connectivity data be used to guide management tasks? What tasks, and how?
1030hr	Coffee Break
1045hr	Recruitment dynamics in corals – short larval lives and difficulty finding places to live. (Bob Steneck)
1130hr	Discussion – Coral recruitment and management needs.
1215hr	Recap: Issues arising from the discussion.
1230hr	Lunch at Anthony’s Key Resort
1500hr	Recruitment dynamics in fish 1) Juvenile habitat shifts, and management requirements of these (Ken Lindeman)
1545hr	Coffee break
1600hr	Discussion – ways of managing local connectivity.
1700hr	Recap: Issues arising from today’s discussions.
1800hr	Close of day
1930hr	Dinner at Lighthouse
Thursday 26 <sup>th</sup> April	
0830hr	Connectivity and recruitment dynamics in fish 2) Larval dispersal: theory and data from the region (Peter Sale)
0915hr	Discussion – Fish dispersal and management needs.
1030hr	Coffee break

1045hr	Recruitment dynamics in lobster – long larval lives and many life stages. (Mark Butler)
1130hr	Discussion – Lobster recruitment and management needs.
1215hr	Recap: Issues arising from the discussion.
1230hr	Lunch at Anthony’s Key Resort
1330hr	Dive opportunity.
1600hr	Connectivity and MPA networks: Using the ecoregional planning process. (Alex Arrivillaga)
1645hr	Coffee break
1700hr	Discussion – Local benefits of regional collaboration in planning and monitoring.
1800hr	Close of session
1930hr	Dinner at Pinochio
Friday 27 <sup>th</sup> April	
0830hr	Abundance trend in Nassau grouper at the Glovers Reef spawning aggregation – impact of MPA establishment. (Peter Sale)
0915hr	Discussion: what has happened at Glovers Reef, and why?
1030hr	Coffee Break
1100hr	Discussion: Building a sustainable management program for our coral reefs – the 5 first steps to take.
1200hr	Recap: What could the Connectivity Program do to aid local managers, and what could managers do themselves to improve the sustainability of our reefs?
1230hr	End of formal workshop
	Lunch at Anthony’s Key Resort
1400-1600hr	Alternate dive opportunity. Additional small group discussions on topics arising during the workshop.
1930hr	Dinner at Henry Morgan
	Participants return home Friday afternoon or Saturday morning

## ANNEX 2

### List of Participants

<b>Name</b>	<b>Contact info</b>	<b>Institution</b>
<b>Belize</b>		
Forman, Ms. Kirah	<a href="mailto:kirahforman@yahoo.com">kirahforman@yahoo.com</a>	Belize Dept of Fisheries, Hol Chan Marine Reserve
Majil, Mr. Isaias	Isaias.Majil@gmail.com, isaiasmajil@yahoo.com	Belize Dept of Fisheries
Finch, Ms. Jocelyn Rae	<a href="mailto:Scmr.science@gmail.com">Scmr.science@gmail.com</a>	TASTE
Gomez, Ms. Gianna	<a href="mailto:gianna_gomez@yahoo.com">gianna_gomez@yahoo.com</a>	University of Belize, Institute of Marine Studies
Neal, Mr. Dwight	<a href="mailto:dwightneal@gmail.com">dwightneal@gmail.com</a>	Friends of Nature, Belize
<b>Guatemala</b>		
Rivas, Ms. Ana Beatriz	<a href="mailto:ab_rivas_ch@yahoo.com">ab_rivas_ch@yahoo.com</a> , <a href="mailto:abima@att.net">abima@att.net</a>	Association de Biologia Marina de Guatemala
Gutierrez, Dr. Lucia M.	<a href="mailto:imgutierrez@att.net">imgutierrez@att.net</a>	Universidad del Valle, Guatemala, Association de Biologia Marina de Guatemala
Alejandro Arrivillaga	<a href="mailto:aarrivillaga@TNC.ORG">aarrivillaga@TNC.ORG</a>	The Nature Conservancy
Salaverria Reyes, Mr. Antonio	<a href="mailto:antoniosalaverria@gmail.com">antoniosalaverria@gmail.com</a>	Dirección General de Pesca y Acuicultura, Guatemala
<b>Honduras</b>		
Zepeda, Ms Calina	<a href="mailto:calinazepeda@yahoo.com">calinazepeda@yahoo.com</a>	BICA
Marcio Aronne	<a href="mailto:marcioaronne@gmail.com">marcioaronne@gmail.com</a>	Fundacion Cayo Cochino, Honduras
Mejia, Astrid	<a href="mailto:amejia@iht.hn">amejia@iht.hn</a>	Bay Islands Environmental Project (PMAIB)
Keck, Jennifer	<a href="mailto:rimsed@globalnet.hn">rimsed@globalnet.hn</a>	Roatan Institute for Marine Science
Nicholas Bach, Greg Puncher	<a href="mailto:roatanmarinepark@yahoo.com">roatanmarinepark@yahoo.com</a>	Roatán Marine Park
Medina, Mr Sotero	<a href="mailto:Bicarootan@yahoo.com">Bicarootan@yahoo.com</a>	BICA, Roatan
<b>México</b>		
Rafael Serralde from Xcalak	<a href="mailto:rroldan@conanp.gob.mx">rroldan@conanp.gob.mx</a>	Comisión Nacional de Áreas Naturales Protegidas, México
Maldonado, Mr. Miguel Angel	<a href="mailto:marina@ceakumal.org">marina@ceakumal.org</a> , <a href="mailto:mikmalc@hotmail.com">mikmalc@hotmail.com</a>	Centro Ecologico Akumal
<b>INSTRUCTORS</b>		
Sale, Peter	<a href="mailto:sale@uwindsor.ca">sale@uwindsor.ca</a>	UNU-INWEH
Steneck, Bob	<a href="mailto:steneck@maine.edu">steneck@maine.edu</a>	Univ. of Maine
Butler, Mark	<a href="mailto:mbutler@odu.edu">mbutler@odu.edu</a>	Old Dominion Univ.
Lindeman, Ken	<a href="mailto:lindeman@fit.edu">lindeman@fit.edu</a>	Florida Institute of Technology
Windevoxhel, Nestor	<a href="mailto:nwindevoxhel@TNC.ORG">nwindevoxhel@TNC.ORG</a>	The Nature Conservancy
Van Lavieren, Hanneke	<a href="mailto:vanlav@inweh.unu.edu">vanlav@inweh.unu.edu</a>	UNU-INWEH

## ANNEX 3

### Questionnaire

#### Spanish

Estimado Participante,

Para ayudarnos a planear el contenido del taller estamos pidiendo la colaboración de los participantes en ayudarnos a identificar los temas a cubrir. Tenga en cuenta que el foco principal del taller es la conectividad, reclutamiento y manejo, y que no queremos desviarnos de estos temas.

Todos sus comentarios, en ingles o español según preferencia, serán resumidos y reportados en el taller, adicionalmente serán usados para definir la agenda a tratar. Por favor provean respuestas específicas a las siguientes preguntas, pero siéntanse libres de ofrecer comentarios adicionales. Responder en el cuerpo de este mensaje y luego enviármelo de vuelta será la manera mas fácil de hacer llegar sus comentarios.

Gracias de antemano. Espero verlos en Roatan.

Hanneke van Lavieren  
for Connectivity program

#### Preguntas:

1. Que tan familiar es usted con el concepto de conectividad, su relación con el reclutamiento y la importancia para el manejo?

MUCHO      MODERADO X      NADA

2. Hace uso actual, o ha hecho uso en el pasado, de relaciones de conectividad en sus actividades como administrador? SI      X      NO

3. Si respondió "sí" a la pregunta numero 2, en que contexto uso las relaciones de conectividad? Que información concerniente a conectividad posee? MUCHOS DE LAS AMP'S EN EL PAIS SE HA DISENADO TRATANDO DE ABARCAR LA CONECTIVIDAD Y SE SABE ESPECIALMENTE EN MUESTREO DE AGREGACIONES DE DESOVE QUE TIENEN QUE ESTAR MUY VINCULADOS .

4. Que tan familiar es usted con el concepto de reclutamiento, y su relación con las actividades de manejo?

MUCHO      MODERADO X      NADA

5. Ha utilizado alguna vez datos de reclutamiento en sus actividades como administrador? SI  
NOX

6. Si respondió “si” a la pregunta 5, en que contexto uso datos de reclutamiento? Que información de reclutamiento posee?
7. Que otros temas considera usted mas importantes que conectividad al hacer decisiones de manejo de áreas marinas protegidas? AMENAZAS, USO DE RECURSOS, DEPENDENCIA SOCIAL, PRIORIDAD NACIONAL
8. Existen impedimentos al uso de relaciones de conectividad en su rol como administrador? Cuales son estos impedimentos?NO
9. Que tan familiar es usted con los programas de monitoreo ambiental a nivel regional?  
MUCHOX                      MODERADO                      NADA
10. Existen ventajas de los programas de monitoreo ambiental a nivel regional comparados con programas locales en áreas protegidas especificas?SI
11. Como lo ayudaría un programa de monitoreo de reclutamiento de especies determinadas a nivel regional en el manejo de sus áreas protegidas locales? ES UN AREA DE MONITOREO QUE NO SE ABARCA MUCHO EN LOS PROGRAMAS EXISTENTES Y ES UN GAP QUE HAY QUE CERAR. LOS ADMINISTRADORES DE AMP NO CONOCEN LAS VENTAJAS Y QUE SON LAS DECISIONES QUE SE PUEDEN HACER CON ESTE TIPO DE INFORMACION.
12. Añada otros comentarios o sugerencias para la agenda.

### **English**

Dear participant,

In order to help us prepare the agenda for our workshop, we are asking all participants to respond with their own suggestions for topics to be covered. Bear in mind that the focus of the workshop is on connectivity, recruitment and management, and we do not want to stray into topics that are unrelated to these.

All your comments, in English or Spanish as you prefer, will be summarized, reported at the workshop, and used to define the agenda. Please offer specific answers to the following questions, but feel free to offer any additional comments. Putting your reply into the body of this e-mail and returning it to me is probably the easiest way to send your comments to us.

In advance, thank you. I look forward to working with you in Roatan.

Hanneke van Lavieren  
for Connectivity program

**Questions:**

1. How familiar are you with the concept of connectivity, its relationship to recruitment, and its importance for management? VERY MODERATELY NOT AT ALL
2. Do you, or have you in the past, made use of connectivity relationships in your activities as a manager? YES NO
3. (If you answered 'yes' to Question 2). In what context did you use connectivity relationships? What information on connectivity did you possess?
  
4. How familiar are you with the concept of recruitment, and its relationship to management? VERY MODERATELY NOT AT ALL
5. Have you ever made use of recruitment data in your activities as a manager? YES NO
6. (If you answered 'yes' to Question 5). In what context did you use recruitment data? What information on recruitment did you possess?
  
7. What other issues would you consider to be more important than connectivity when making decisions for managing a proposed marine protected area?
  
8. Are there impediments to you making use of connectivity relationships in your role as a manager? What are these impediments?
  
9. How familiar are you with region-wide environmental monitoring programs? VERY MODERATELY NOT AT ALL
10. Are there advantages to region-wide monitoring programs, compared to local programs at a specific protected area?
  
11. How could a region-wide program for monitoring recruitment of selected species assist you in your management of your local protected area?
  
12. Add any other comments or suggestions for the program that you wish to make.