

Report of an international workshop on:

“Different survey methods for coral reef fish, including methods based on underwater video”:

Honiara Campus, University of the South Pacific,

Solomon Islands (10th to 13th September 2013)

The University of the South Pacific (USP) Honiara campus, Solomon Islands, the Secretariat of the Pacific Community in New Caledonia (SPC), IFREMER in New Caledonia and the French Institute for Pacific Coral Reefs at Moorea, French Polynesia (IRCP) have joined in a partnership to develop and offer the *"Different survey methods of coral reef fish, including the methods based on underwater video"* workshop. This workshop was funded by the French Embassy (Pacific Fund). There were two key objectives to the workshop: to allow USP students (8 students involved in this workshop) to learn the different techniques of fish monitoring; and to increase capacity at the level of USP, government and NGO staff (20 persons) already involved in fish monitoring, particularly with regards to recent underwater video techniques and data analysis tools. To achieve these objectives, the workshop was split into two parts (see annex 1):

1. Seminars were held at USP campus on Tuesday. These seminars were meant to provide a knowledge base in ecology of coral reef fish and in surveys methodology. Thus, the different monitoring networks of IRCP, IFREMER, IUCN, SPC and World Fish in the South Pacific were explained to the participants.
2. A field training program was run at Naro village on Wednesday and Thursday, and the data collected in the field analyzed on Friday at USP campus. The training program provided a knowledge base in recent counting methods of fish.

Overall, 28 participants were involved in this workshop, belonging mainly to USP and to different Solomon NGOs (see annex 2).

Abstract of workshop:

Since 2006, the USP and the IRCP have joined in a partnership to develop and offer several workshops on USP campus. These workshops were funded by the French Embassy (Pacific Fund). Two key objectives to the workshop: 1/ to allow USP students to learn the different techniques of coral reef monitoring (coral, fish and invertebrates); 2/ to increase capacity at the level of USP, government and NGO staff already involved in coral reef monitoring.

2006: Examination of the effectiveness of different taxonomic survey intensities represented by different methodologies in understanding affects of Marine Protected Area designation on fish population abundance in a Fijian context ;

2008: Coral Reef Ecology and Survey Methods Workshop (size estimation of fish inside and outside MPA, and recent techniques for habitat description and monitoring) ;

2012: Monitoring & Survey Methods in Coral Reefs (fish and benthic invertebrates) ;

2013: Different survey methods for coral reef fish, including methods based on underwater video.

During the workshop at Solomon in 2013, the objectives of two field trip days were to compare different survey methods of coral reef fish, including the methods based on underwater video. Thus, we went two days at Naro village to test four different fish survey' techniques:

1/ GCRMN techniques: Local participants in Solomon Islands use generally a technique implemented by the GCRMN. They use the belt transect fixed width (5m) and count mostly commercial fish. All the participants applied this method in order to compare to the other methods (IRCP, IFREMER and SPC techniques). First, they install the tape (25m long), then record fish length and fish number on each side of the transect (2.5m to the right and 2.5m to the left). The figure below shows an example of fish recording with GCRMN method along three transects on the Naro reef.

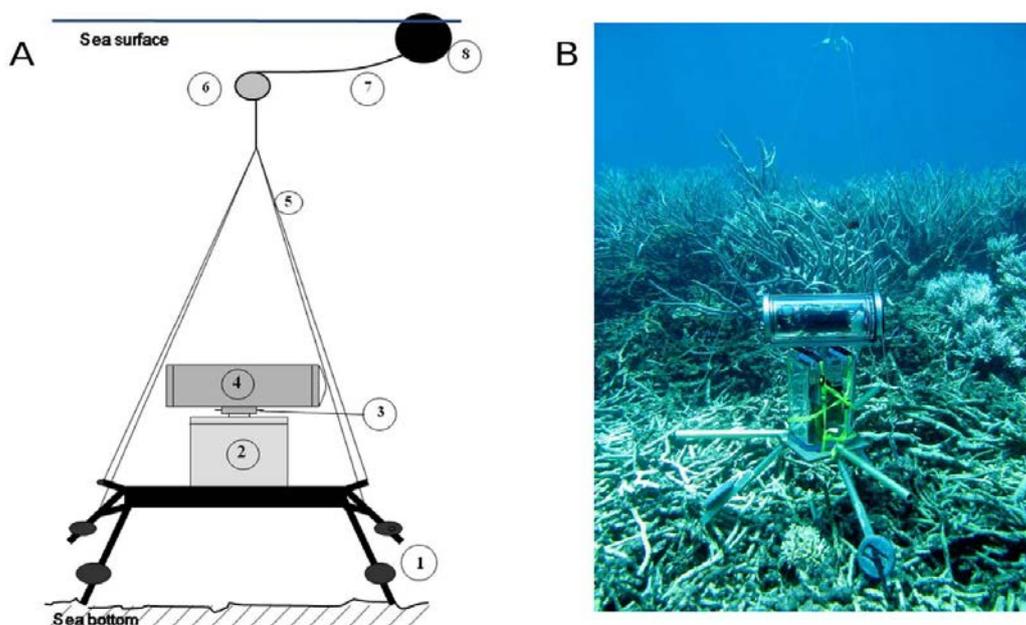
name: Patrick Mesia **habitat:** Reef crest
date: 04/08/10 **time:** 10:00AM **tide:** Low **transect length:** 50m
location: Reef on south of Mary Island **transect width:** 4m
management (Tabu/Open): Tabu area closed for 1 year and 6 months

| Fish | | Transect 1 | Transect 2 | Transect 3 |
|--------------------------------------------------------------------------------------------------|---------------------|------------|------------|------------|
|  Parrotfish | Bumphead | 40 | 25 | |
| | Longnose | 25 | | |
|  Groupers | Coral trout | 15, 25, 10 | | 25 |
| | Barramundi cod | | | |
|  Emperors | Thumb print | 17 | 23 | |
| | Longnose | | | |
| | Big eye | | | |
|  Sweetlip | Orange striped | | 28 | |
| | Spotted sweetlip | 4 x 20 | 25, 25 | |
| | Giant | | 35 | |
|  Wrasse | Maori Wrasse | | | |
| | Tusk | 13 | | 9 |
|  Rabbitfish | Gold Spot | | | |
| | Barred | 3 x 15 | 8 | |
|  Snapper | Paddle tail | | 8 x 10 | 15, 20 |
| | Blubberlip | 28 | 20 | |
| | Mangrove | | 25 | |
| | Red bass | | | |
|  Surgeonfish | Striped surgeonfish | 6 x 10 | 10, 5 | |
| | Ringtail | 3 x 8 | | 20 |
|  Butterfly fish | Vagabond | 7 | | 9 |
| | Eclipse | 7 | | |
|  Triggerfish | Orange lined | 8 | 8, 10 | 10, 15 |
| | Titan | | | |
| Other Species | | | | |
| Draw | name | | | |

2/ IRCP techniques: We proposed a variation of the “traditional” GCRMN method that uses the same fixed width belt transect (25m long and 5m width), but with three passes along the transect. The goal of this IRCP method is to simplify each pass by leaving the abundant resident and cryptic fish for the 2nd and 3rd pass. For the Naro' trip, we chose to put the groupers, damselfish and surgeonfish in the 2nd pass. In the 3rd pass, we focused on soldier fish, scorpion fish, hawk fish, gobies and blennies. We unreel the transect while counting the 1st pass and at the 4th pass, we fold the tape back. We write the number and size of fish on the same template as for GCRMN method.

3/ SPC techniques: We used the distance-sampling underwater visual census (D-UVC) method. The D-UVC method is the preferred method of the SPC for in-water assessments of the status of reef fish populations. In this method, surveyors count individuals of the species of interest along a transect line, and estimate their length and perpendicular distance from the transect line, with no set limit to the distance at which fish are recorded. Rather, fish are recorded as far away from the transect line as visibility allows. Typically, the approach involves two surveyors, recording on either side of a 25m transect line. The approach allows for enumeration of wary species which may avoid divers and therefore not be counted in fixed-width belt transects, such as large commercial fishes and sharks, and allows for resolution of the fact that optimal observation distances differ among species. The participants used this techniques on three transects at Naro reef.

4/ IFREMER techniques: The video system consisted in two waterproof housings related by an axis. The lower housing contained an electric engine powered by 2.4V rechargeable batteries which sets in motion the axis related to the upper housing enclosing the HD camera (see figure below). The two housings were tied onto an aluminum support that was dropped from the boat onto the sea bottom. The support was rigged to an intermediate buoy that keeps the rigging tight, this buoy being itself fixed to a rope connected to a larger buoy in surface that was used to retrieve the system at the end of the observation. The camera was a HD Sony™ camera HDR-SR11 with an integrated 30 Gigabyte hard drive enabling the recording of up to 4 hrs of HD images. The camera recorded a signal with a full HD resolution of 1080 pixels. Images were saved on the internal hard drive using the AVCHD™ format which is based on the MPEG-4 AVC/H.264 for image compression. The housing and camera resulted in a focal angle of 60 degree. The system were set on the sea floor at Naro reef (at three sites) and rotated at predefined time intervals from a fixed angle (60° at each rotation and every 30 seconds).



Description of the underwater rotating video system. (A) 1) weighted aluminum support; 2) engine housing; 3) rotating axis; 4) video camera housing; 5) nylon fishing line; 6) intermediate buoy; 7) floating rope; 8) surface buoy. (B) picture of the system.

Overall, the fish data collected in the field at Naro were analyzed on Friday at USP campus by all participants and we compared the difference in fish abundance between the four techniques (GCRMN, IFREMER, SPC and IRCP methods). Moreover, each participant could give his opinion about the advantages and disadvantages of each technique.

Annex 1: Workshop program

Day 1: Tuesday 10th September, 2013 (*USP campus*)

9:00 - 9:30 => Welcome to USP Prof. J. Usuramo (USP) & D. Lecchini (IRCP)

9:30 / 10:00 => Presentation of research and outreach thematic of IPCR (C. Berthe & D. Lecchini)

10:00 / 10:30 => Presentation of research and outreach thematic of IFREMER (D. Pelletier)

Coffee break => 10:30 / 11:00

11:00 / 11:30 => Presentation of monitoring programs of IUCN (V. Waqalevu)

11:30 / 12:00 => Presentation of monitoring programs of SPC (B. Moore)

lunch break => 12:00 / 13:30 (offered by IRCP)

13:30 / 14:00 => Presentation of monitoring programs of IPCR in the Pacific (G. Siu)

14:00 / 14:30 => Presentation of monitoring programs of WWF (T. Leve)

14:30 / 15:00 => Presentation of video technique for fish surveys (W. Roman)

Coffee break => 15:00 / 15:30

15:30 / 17:00 - General discussion and presentation of the training course (IRCP, IFREMER, SPC)

Day 2: Wednesday 11th September, 2013 (*Naro site*)

8:00 - 16:00 - Training course at Naro site (bus transport from USP)

Day 3: Thursday 12th September, 2013 (*Naro site*)

8:00 - 16:00 - Training course at Naro site (bus transport from USP)

Day 4: Friday 13th September, 2013 (*USP campus*)

9:00 – 12:00 - Analysis of results acquired during the training seminar

lunch break => 12:00 / 14:00

14:00 – 16:30 - General discussion about the workshop

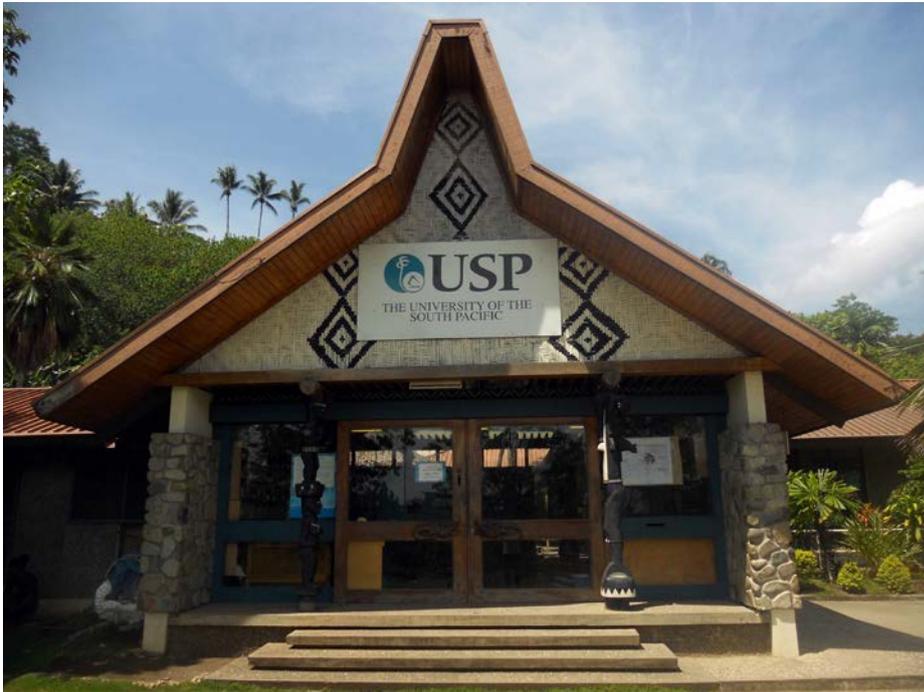
16:30 – 17:00 - Official Closing of Workshop

17:00 – 19:00 - Farewell Party at USP (*offered by IRCP*)

Annex 2: Lists of participants

| | Family name | Nickname | Organisation | Address of organisation |
|----|-------------|---------------|------------------------------------------------|--------------------------|
| 1 | Usuramo | John | USP | Honiara, Salomon |
| 2 | Pelletier | Dominique | IFREMER | New Caledonia |
| 3 | Roman | William | IFREMER | New Caledonia |
| 4 | Siu | Gilles | IRCP / CRIOBE | Moorea, French Polynesia |
| 5 | Lecchini | David | IRCP / CRIOBE | Moorea, French Polynesia |
| 6 | Berthe | Cecile | IRCP / CRIOBE | Moorea, French Polynesia |
| 7 | Moore | Brad | SPC | New Caledonia |
| 8 | Asitarau | Moses | USP | Honiara, Salomon |
| 9 | Sulu | Reuben John | World Fish | Honiara, Salomon |
| 10 | Gerenui | Collin | The Nature Conservancy | Honiara, Salomon |
| 11 | Bennett | Gregory | World Fish | Gizo, Salomon |
| 12 | Leve | Tingo | WWF | Gizo, Salomon |
| 13 | Hughes | Alec | James Cook Univ | Australie |
| 14 | Prasad | Arvinda Rishi | USP | Honiara, Salomon |
| 15 | Lausuu | Peter | Ministry of Fisheries and Marine Resources | Honiara, Salomon |
| 16 | Kenilorea | Peter | Ministry of Fisheries and Marine Resources | Honiara, Salomon |
| 17 | Ramo | Ruth | USP Salomon Island Campus (clerical assistant) | Honiara, Salomon |
| 18 | Bimo | John | Professional diver | Honiara, Salomon |
| 19 | Waqalevu | Viliame | IUCN Fidji | Suva, Fidji |
| 20 | Kereseke | Jimmy Qoloni | The Nature Conservancy | Honiara, Salomon |
| 21 | Lugitau | Lawrence | USP student | Honiara, Salomon |
| 22 | Lasimae | Robson | USP student | Honiara, Salomon |
| 23 | Lilo | Mark | USP student | Honiara, Salomon |
| 24 | Cortis | Jordy | USP student | Honiara, Salomon |
| 25 | Anisi | Hellena | USP student | Honiara, Salomon |
| 26 | Amai | Billy | USP student | Honiara, Salomon |
| 27 | Baiabe | Elizabeth | USP student | Honiara, Salomon |
| 28 | Leni | Junior | USP student | Honiara, Salomon |

Annex 3: Some pictures of workshop



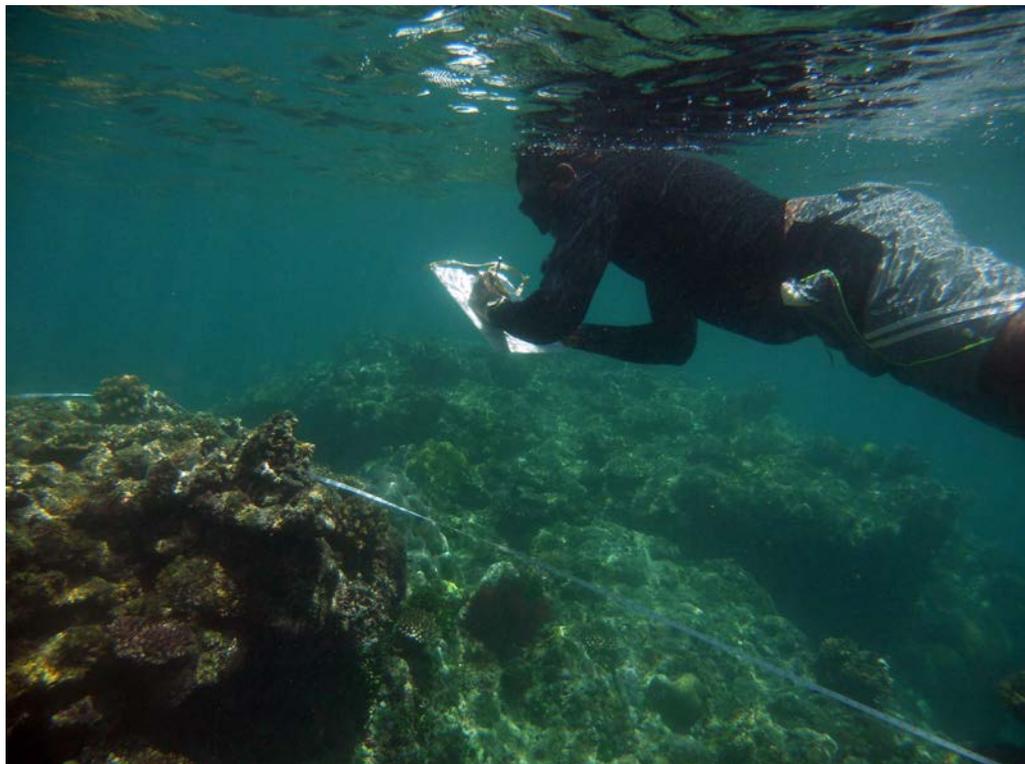
Campus of the South Pacific University at Solomon Islands



Opening ceremony by John Usuramo, Director of Solomon USP campus



Picture of all participants during the seminars conducted at USP campus



Participant recording the fish along transect with IRCP technique



Picture of all participants during the two field days at Naro village



Analysis of fish recording of each participants at USP campus on the last day of workshop

Annex 4: Article about the workshop in the journal 'Solomon star'

Fish seminar opens here

By DENVER NEWTER

A SEMINAR focusing on coral reef fish, the first of its kind to be held here, opened in Honiara yesterday.

It was jointly organised by the University of the South Pacific (USP) Honiara Campus, Secretariat of the Pacific Community (SPC), France Institute for Exploration (IFREMER) in New Caledonia, and the France Institute for Pacific Coral Reefs at Moorea, French Polynesia (IRCP).

Eighteen representatives from various local Non-Government Organisation (NGO) and 10 USP students are attending the four-day workshop.

The workshop aims to teach the participants the different types of techniques of fish monitoring as well as increasing their capacity at the highest level.

The workshop is funded by the French Embassy (Pacific Fund).

Professor and Director of the Institute for Pacific Coral Reefs at Moore, David Lecchini, said the workshop was the first ever to be organised here.

He said they usually organised the workshop at the USP Laucala, Fiji, even and NGO staff learn the different techniques of fish monitoring and increase their capacity at the highest level," Professor Lecchini said.

Facilitators from New Caledonia, French Polynesia and Solomon Islands are facilitating the seminar.

Professor Lecchini said today and tomorrow, participants and facilitators will travel to Naro Conservation site in West Guadalcanal to do an underwater survey as well as fish monitoring.

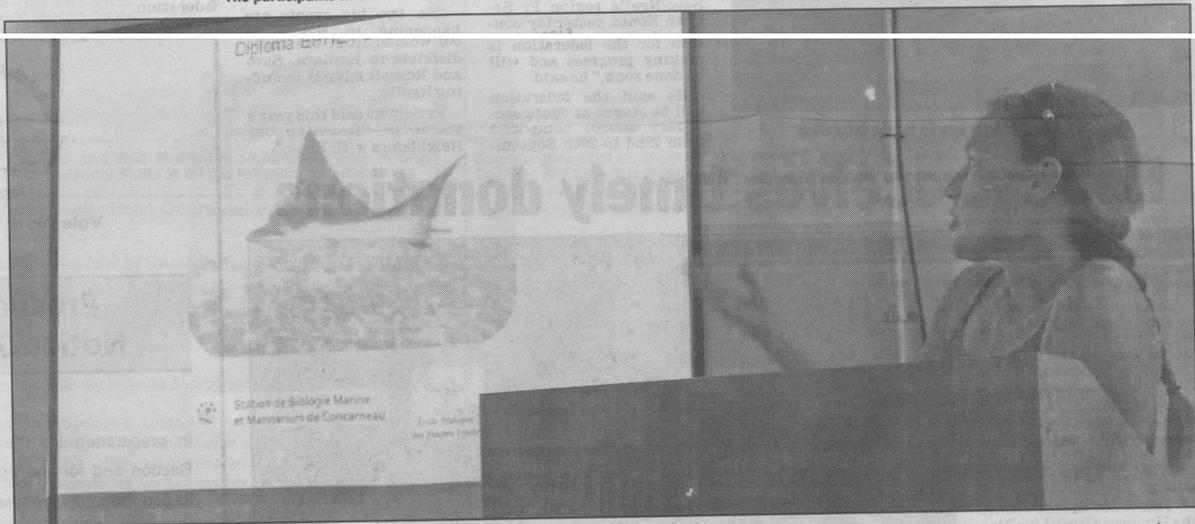
"Part of the workshop includes monitoring at conservation areas to observe the fish population there.

"After our monitoring exercise, we'll return and analyse the results."

The seminar ends Friday.



The participants at the Coral Reef Fish Workshop opens at the USP Mokolo Building yesterday. Photo Supplied.



An overseas facilitator making her presentation yesterday.

Red Cross hails PIF's stand on climate change

AS the 44th Pacific Islands Forum (PIF) draws to a close in the Marshall Islands capital Majuro last week, the International Federation of Red Cross and Red Crescent Societies (IFRC) welcomes the commitment made in the 'Majuro Declaration for climate leadership' to scale up efforts to prepare for – and adapt to – the intensifying effects of climate change.

Leaders of the PIF underlined the need for urgent action at all levels to reduce greenhouse gas emissions, and to respond urgently and effectively to the social, economic and security effects of climate change to ensure the survival and viability of all Pacific small island developing States.

These commitments come at time when the Marshall Islands

is still recovering from the severe drought that affected 15 of the northern atolls earlier in the year, prompting the government to declare a state of emergency.

During the drought the Red Cross deployed disaster response teams to support emergency water production across several locations on the outer atolls. Now the focus is on linking these efforts to longer term risk reduction.

"Our main priority is to help these communities to become more resilient in the face of changing weather patterns," says Victoria Bannon, the IFRC's operations coordinator in Majuro.

"We are working with communities to help aid their recovery from this year's drought and develop greater resilience to future hazards."

The Red Cross operation is now focussed on ensuring that relief efforts also contribute towards long-term recovery, working with local volunteers across three atolls to repair and improve household and community rainwater harvesting systems, including installing water tanks and roof guttering.

"By engaging local volunteers we aim to build a stronger sense of ownership and ensure that the systems put in place now will be maintained in the longer term," Bannon says.

Boston Larron lives on one of the islands of Namu Atoll. He says his whole community was affected by the drought. "We did a lot of work hauling water from the well.

Some people had none and had to take water from one end of the

island to the other using the communal cart."

But the reverse osmosis unit provided by the Red Cross was a big help in providing fresh water to the community during the peak of the drought.

"We learned a lot from this drought and don't want to run into it again," says Larron.

"We definitely need to be more prepared by fixing our roof gutters. It's important to catch every drop of water."

Climate change is a topic of conversation discussed daily in the Marshall Islands.

"People we've spoken to are worried the drought will return. They are concerned about their livelihoods and basic things such as having access to drinking water – these are the ground reali-

ties," says Bannon.

Climate change is compounding the effects of already highly variable weather patterns in the Pacific.

El Niño and La Niña events cause fluctuations in rainfall and cyclone risk to Pacific Island countries, including the Marshall Islands.

In the future, climate change is expected to contribute to more extreme weather events, and according to the World Bank, in the next 50 years the Marshall Islands has a 50 per cent chance of experiencing a disaster loss exceeding 53 million USD.

The drought in the Marshall Islands first took hold in April 2013.

In June, the IFRC launched its emergency appeal for 803,000 Swiss francs (USD 861,000).