High Definition Video Systems for monitoring biodiversity in Marine Protected Areas

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Aim: Investigate the feasibility and suitability of video-based observation techniques for monitoring fish and habitat in and around MPAs

Several techniques implemented: Towed video, Video transects, Rotating stations

Presentation of results from rotating stations

Study site: Southwest Lagoon of New Caledonia:
- Sites within & outside no-take marine reserves
- Various habitats: reef areas, seagrass beds, etc.

Number of valid stations: 196 in 2007, 330 in 2008

Image analysis:
Number of individuals per species per size class for a list of 34 families including fished species and large species
Mean abundance per station

- 0 - 2
- 3 - 8
- 9 - 14
- 15 - 21
- 22 - 36
- 37 - 54
- 55 - 78
- 79 - 384

2007 data (196 stations)
Species richness per station

- 0 - 4
- 5 - 10
- 11 - 16
- 17 - 24
- 25 - 36

2007 data (196 stations)
Scarus ghobban

Lethrinus nebulosus

Scarus rivulatus

Plectropomus leopardus
Species number per station

Mean abundance per station

2007 data (78 stations)
What do we observe on videos?

- **Good identification of species** (1% family level, 5% genus level, 168 species observed (in 196 stations))
- **Large abundance of target species observed** (Acanthuridae - Naso, Lethrinidae, Serranidae, Lutjanidae, Scaridae, Siganidae, etc.)
- **Emblematic/large species frequently observed** (turtles, rays, sharks, snakes, humphead wrasse)
- **Images can easily be analysed for habitat** (e.g. using Multi-Scale Approach)
## What does it take?

<table>
<thead>
<tr>
<th>Technique</th>
<th>Time (observation, image analysis, data input)</th>
<th>Staff required</th>
<th>Nb of observations per day</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UVC</strong></td>
<td>- <em>in situ</em>: 45’ to 1h30 per fish transect &amp; 10’ per habitat transect; 15’ for data input</td>
<td>- 2 divers (1 fish expert)</td>
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<td>- 2 to 3 transects / day X diver</td>
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<tr>
<td><strong>Rotating Stations</strong></td>
<td>- <em>in situ</em>: 20’ per station; image analysis: 10 to 45’ per station for fish &amp; 5’ for habitat</td>
<td>- 1 or 2 persons and a pilot</td>
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<td>- 20 stations / day (1 system)</td>
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<td>- 30 to 5 stations / day (2 systems)</td>
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### A priori interest for MPA monitoring

<table>
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<tr>
<th>Method</th>
<th>Observations</th>
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| **Underwater Visual Transects** | - Most complete observation of fish assemblage  
                             - Widely used  
                             - Requires qualified divers  
                             - Diver effect on fish  
                             - Observer effect on counts  
                             - Additional field effort for habitat |
| **Rotating videos**            | - Rather complete observation of fish assemblage  
                             - No diver effect on fish  
                             - Limited observer effect (multiple image analysis)  
                             - Quick, enables good spatial coverage  
                             - Images are archived |
| **Baited Underwater Video**    | - Few species and few fish observed here  
                             - Relatively long observation time  
                             - Images are archived |
Thank you