



A Rapid Environmental Impact Assessment of Tsunami on Protected Areas for the Department of Wildlife Conservation (DWC) of Sri Lanka

- URGENT BRIEF -

- Feb 3rd, 2005 and updated Feb 25th, 2005 -

At the request of the Department of Wildlife Conservation and in following the terms of reference established by the seven member steering committee, the Sri Lankan Wildlife Conservation Society with assistance from The Nature Conservancy undertook a rapid assessment of the environmental impacts of the tsunami on key protected areas in the South and South East of the country.

Our terms of reference, briefly, were:

- Rapid mapping and assessment of area and extent of Tsunami impact on Protected Areas and important biological sites from Hikkaduwa to Okanda.
- Develop preliminary recommendations for medium/long term monitoring and restoration.
- Assess future needs.

Marine Surveys



At four sites (Hikkaduwa, Unuwatunne, Mirissa & Polhena) we carried out surveys of the reef through diving and snorkeling at points along the reef at a depth between 2m and 27m. Two divers, 3m apart, observed signs of major coral breakage, large debris, clarity, and % live coral along 100 m transects on the reef. At each site between three and four transects were conducted. At each site a local diver was involved in the collection of this information.

Our summary findings are:



1. Visibility at all sites was extremely poor, 2 – 3m on most dives including the deep dive at over 25m. The water had a great deal of what looked like organic sediments. Reports from local divers indicate that this time of the year the visibility was usually 20 to 30m.
2. Live coral coverage was in most places around 10 – 20 %, a result of coral bleaching. The notable exception is at Polhena with greater amounts of live coral.

3. The coral showed only minimal signs of recent breakage, most notably at Hikkaduwa, where several large fragments of live coral were found. In all, the live coral seemed to have fared well through the tsunami.
4. Recently transplanted coral (part of a pilot restoration program) at Hikkaduwa remained virtually untouched in just 2 m of water.
5. A great deal of large debris (pipes, building materials, boat fragments) litter the reef and wave action poses a grave and continual threat to the reef. These must be removed immediately.
6. Four fishing nets, one 40m, long can be found on the reef at Hikkaduwa, still killing fish.
7. Beaches, except at Hikkaduwa, remain a major source of ocean pollution and are strewn with debris.
8. There is virtually no education or visible enforcement of marine protection regulations at any of the sites we visited.



Terrestrial Surveys



We first examined the impact of the tsunami on several different ecosystems including, beach, dune, wetland, marsh, and arid scrub forest. We coordinated our efforts with those of Dr. P. Fernando (Chairman, CCR) who was conducting a detailed study of the impact on vegetation at certain select locations.

Having exhausted the feasible options to go by 4WD, by foot, and by boat we carried out the surveys along inaccessible coast lines by using a helicopter to trace the outline of the wave all the while recording our exact position using satellite imagery. We flew 80 km of coastline (280 km of flying in total) following the coast line from Bundala to Okanda. We mapped the extent of the wave impact by tracking and recording on high quality GPS units the zone of impact recognized by debris and vegetation changes. We carried out this survey at an altitude of between 120 m and 150 m.

Our summary findings are:



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1. The impact of the tsunami on the intact coastline of the Bundala and Yala National Parks is severe (at least at first look) but localized. There is major structural damage to the vegetation and the grass is almost uniformly brown in areas inundated by the water. However, there is already extensive signs of re-growth and regeneration
2. The total grassland, forest, and wetland area directly impacted is about 5000 ha in Yala National Park. This does not include the beach and dunes.
3. A couple of ponds remain saline while most have reverted to freshwater with amphibians and many animal tracks nearby.
4. There is a major emergent infestation of prickly pear cactus, which because of the tsunami has been broken and spread through out the impact zone, particularly at human habitation sites in Yala (e.g. where the Browns Beach Hotel stood).

5. Much of the vegetation covering Kumana wetlands in the north end of Yala has been at least temporarily inundated. It appears brown in color and has been blown down by the wave. A close field inspection is needed to verify the impact.
6. Regeneration of vegetation, rather than succession, appears to be prevalent in



affected areas.



Proposed Action Items



1. MEDIA

Immediate national and international media release by DWC regarding outcomes of meeting, key findings, and next steps of DWC and NGO response to Tsunami impact. [DWC]

2. HIKKADUWA MARINE SANCTUARY

Develop with NARA and IUCN a bullet point action plan for the recovery of this important marine park. Key partners include Open University, CCD, SLWCS, DWC, NPPA and SL Navy with the CRMP.

February 2nd meeting in Colombo to finalize plans

- a. Coordinate priority list of activities for Hikkaduwa and other Southern coastal coral reefs
- b. Tasks (in order of importance)
 - i. Prevent debris from being dumped either on the coast or in the sea as the impact on fishing and recreational use of the areas as

well as the environment itself will be too great.

- ii. Clean up debris on reef and beach –fishing nets, sunken boats, large metal objects, construction material, housing materials, and other large debris with potential to continually damage reef/beach. Employ local community to assist in clean up efforts
- iii. Licensing and regulations for glass bottom boats and dive shops
- iv. Demarcation of boundary of park on ocean and land
- v. Establish a minimum of 3 mooring buoys for dive boats
- vi. Education and enforcement activities maintained through a permanently station DWC ranger with access to working motorized boat.
- vii. Coral reef restoration using replanting techniques piloted here 4 years ago.

3. TURTLE NESTING BEACHES

2. Support IUCN/DWC in the following
 - a. Setting standards for turtle hatchery operators. Promoting good practices following principles already studied by IUCN/TCP.
 - b. Turtle nest protection in key areas and establishment of Rekawa/Lunama-Kalamatiya Turtle Refuge (elevation of conservation status from sanctuary).
 - c. Re-deploy turtle nest protection rings.

4. BUNDULA

1. Immediate removal of prickly pear along beach
2. Seining/Salinity testing by NARA
3. Biodiversity map of area
4. Bird census by FOGSL/CBC
5. Mangrove restoration by IUCN
6. Involve community in invasive species removal and restoration work.

5. YALA

1. Immediately notify hotels to do environmental/beach cleanup, give them place to dump waste and debris. Effort to be monitored by CEA.
2. Immediate removal of prickly pear under community employment scheme. [DWC/CCR/SLWCS]
3. Monitoring regeneration or succession and watch for spread of invasives in select sites in Block 1 and ideally Block 2 and Kumana [Led by CCR. Logistical support by

SLWCS]

4. Determine nature of Tsunami impact on Kumana swamp where several hundred hectares appear affected from aerial survey. [Led by CCR. Logistical support by SLWCS]
5. Establish Tsunami Recovery Information Center as part of upgrading of visitor center. Video of fly over for presentation at Yala. Permanent record of impact and recovery of natural system for tourists and interested scientists. Design and layout of Tsunami Visitor Center at Yala office. [Led by SLWCS/TNC. Scientific input by CCR]
6. Very High (1m) resolution satellite imagery of affected areas –analysis and procurement [Led by TNC/SLWCS]
7. Biodiversity map of area [Led by CCR. Logistical support by SLWCS]

The Nature Conservancy and the Sri Lankan Wildlife Conservation Society acknowledge the generous support provided for this assessment by the Seedling Foundation and by National Geographic Society. We also greatly appreciate the support of Yala Village Hotel and Decaan Aviation as well as the other institutions involved in this assessment.

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LIST OF ABBREVIATIONS

CBC – Ceylon Bird Club
CCR – Centre for Conservation Research
CCD – Coast Conservation Department
CEA – Central Environmental Authority
CRMP – Coastal Resources Management Project
DWC – Department of Wildlife Conservation
FOGFL – Field Ornithology Group of Sri Lanka
IUCN – International Union for the Conservation of Nature
NARA – National Aquatic and Resources Agency
NGO – Non Governmental Organization
PPA – Pollution Prevention Authority
SLWCS – Sri Lanka Wildlife Conservation Society
TCP – Turtle Conservation Project
TNC – The Nature Conservancy