



Operation
Wallacea

Conservation research through academic partnerships

Risk Assessment and Management
In Cuba 2011

Risk assessment and management index

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Key: L = Low; M = Medium; H = High

2011 – S1 Transfers between sites

Risk	Likelihood of occurrence during expedition	Severity of occurrence	Control Measures
Traffic accident in Havana or on the way to Colony Hotel	L	H	The driving in Havana and on Cuban roads is generally well ordered with a strong police presence to deter infractions of the rules. Taxis generally don't have seat belts fitted though. Participants to minimise unnecessary road travel and to be advised to go out in the areas where they are staying rather than take taxis if possible. Where there is pre-arranged transport for volunteers, the drivers of this transport to be told to be sure to drive slowly and safely.
Mugging or violence	L	H	Unlikely since the majority of people are friendly and there is a strong police presence to ensure that visitors are well protected. Everyone arriving will be met at the airport and accompanied to their hotels by staff from the travel agents with whom they booked the rooms. Volunteers will have a 24/7 mobile number for the Opwall Coordinator to call for advice and help or if there are any problems before or after the expeditions.
Volunteer getting lost in Havana	M	M	All volunteers to be given contact numbers for English speaking staff.

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2011 – S2 Colony Hotel

Risk	Likelihood of occurrence	Severity of occurrence	Control Measures
Need for emergency medical treatment or evacuation	L	H	There is a 24hr medical centre in the hotel, and telephone communication is available both via landlines and cellular phones. If an injury is serious enough to require evacuation to the hospital, the ambulance and paramedics will be called from the hospital in Nueva Gerona to meet the boat at the dock, and the patient will be taken to the hospital (40 mins approx).
Sandfly or mosquito bites becoming infected	M	L	Whilst in the hotel area there are very few insects, there are lots of sandflies and mosquitos on the beaches which run along the front of the hotel, and the bites can become infected if not treated properly. Volunteers to be briefed on ensuring they cover up and wear repellent, particularly in the evenings and when there is little wind, to protect against sandflies and mosquitos. All volunteers to be advised to bring antihistamine to treat bites with.
Stings or bites from land-based organisms	M	L	There are scorpions on the beaches and students must take care to check their shoes and clothes before dressing. The stings if they happen are painful but not dangerous and can be treated with antihistamines. There are no venomous snakes in Cuba.
Getting bitten or stung by dangerous marine organisms	L	M	No volunteer or staff member to be allowed into the water until they have been trained in the dangerous marine organisms that can be encountered. Shoes to be worn at all times when wading or snorkelling. Volunteers to be warned of dangers of picking up shells, etc from the beach/in shallow water.
Being hit by falling coconuts.	L	M	Ensure that all staff and volunteers are advised to look and make sure that they do not walk directly under a coconut tree. Ensure that all volunteers and staff are warned to take particular care during periods of high winds.
Mugging or violence	L	H	Highly unlikely since the hotels is very remote and there are no nearby settlements. There are security staff on duty throughout the day and night at the entrance points to the hotel.
Drowning	L	H	No volunteers to be allowed to swim in the sea at night, and swimming only allowed when a staff member is in attendance
Alcohol related injury	L	M	Sale of alcohol monitored by hotel staff and opwall staff. No alcohol to be served to anyone under the age of 18, or who appears intoxicated. Anybody who is intoxicated to be prevented from diving the following day.
Risk of Fire	L	M	Hotel is compliant with national fire safety standards, with fire extinguishers and multiple fire exits available.

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2011 – S3 Dive boat and research vessel

Risk	Likelihood of occurrence during expedition	Severity of occurrence	Control Measures
Boats being unseaworthy, leading to increased risk of sinking	L	H	<p>All the vessels being used are registered with the Cuban national boat register and maritime safety control. All regulations are based on OLAS, the safety of life at sea international convention from the International Maritime Organisation (IMO). Safety regulations for Cuban ships carrying passengers (list 5) are very strict.</p> <p>The vessel are inspected by the port authority every year and every four years the boats are taken out of the water and the condition of the engine and hull examined.</p> <p>all crew have training in survival techniques, navigation, first aid and medical first aid, advanced fire fighting and marine pollution prevention.</p> <p>Vessels carry a full complement of communications and navigation equipment, flares and other signal devices.</p> <p>There is a comprehensive emergency plan for the vessel and all emergency procedures are drilled regularly.</p>
Engine failure and being stranded or overturned if the engine failure occurs in high seas	L	H	<p>The engine is very well maintained and the ships are moored in the lee of the bay or in the marina throughout the whole expedition. The ships are in radio contact with the Marina who can raise additional help and coordinate any necessary rescue operations.</p>
Becoming lost in poor visibility weather or at night and hitting a reef	L	H	<p>High resolution GPS linked with geo-referenced satellite images and charts on a laptop are used for navigation. Way marks for all routes have been entered onto the GPS.</p>
Explosion or fire on board	L	H	<p>All boats carry fire extinguishers (including 2 powder, 1 foam, 2 carbon dioxide) and have a pump system with large bore hose for fire control. Buckets and fire axes are also available. Comprehensive action plan is on board with specific roles for crew in emergencies.</p> <p>All gas cylinders for cooking are isolated when not in use.</p> <p>Ensuring that all dive tanks, oxygen tank and compressor on board are serviced before the start of each season.</p> <p>Life rafts on board are capable of holding passengers in the event of needing to abandon ship.</p> <p>First Aid kit on board for the treatment of injuries.</p>

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			Gas systems used for cooking to be kept serviced and kitchen facilities only to be used by crew and in appropriate conditions
Control measures not implemented	M	M	Camp Manager to be responsible for auditing the control measures and camp procedures on a fortnightly basis. These audit reports including details of non compliances and corrective measures to be available for inspection on site

2011 – G1 Turtle survey work

Risk	Likelihood of occurrence during expedition	Severity of occurrence	Control Measures
Tripping or falling on the beach at night	H	L	All volunteers and staff briefed at start of expedition in safety procedures for trekking. Staff member with survey group to carry or have access to a first aid kit at all times so that any injuries can be dealt with until professional medical help arrives or the patient can be evacuated to hospital facilities.
Alligator attack	VL	H	Only the beach next to the ranger station to be patrolled at night. Alligators cross the other beaches at night on their way to and from the lagoon to feed on the reefs
Sandfly and mosquito bites	H	L	All volunteers to be completely covered including head net and gloves for night surveys. Deet based repellents to be used.
Control measures not implemented	L	M	Local Opwall coordinator to be responsible for auditing the control measures on a regular basis (see relevant audit form). These audit reports including details of non compliances and corrective measures to be available for inspection on site

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2011 – G2 Manatee survey work

Risk	Likelihood of occurrence during expedition	Severity of occurrence	Control Measures
Falling off the boat	H	L	All volunteers to be briefed on safe operating procedures
Heat related illness (e.g. dehydration)	M	M	All volunteers and staff to be briefed on how to avoid dehydration and other heat related debilitating illnesses. All volunteers to wear hats and high factor sunscreen when operating in exposed boats.
Alligator attack	M	L	Snorkelling surveys only to be carried out in open water. No volunteers to be allowed on snorkelling surveys in mangrove channels
Control measures not implemented	L	M	Local Opwall coordinator to be responsible for auditing the control measures on a regular basis (see relevant audit form). These audit reports including details of non compliances and corrective measures to be available for inspection on site

2011 – G3 Diving and dive preparation, and marine based survey activities

Risk	Likelihood of occurrence during expedition	Severity of occurrence	Control Measures
Decompression sickness	L	H	<p>Ensure all diving procedures are followed completely.</p> <p>Limit for all dives >10m to 2 per day, minimum 3 hour surface interval, maximum depth 18m for survey dives, and maximum depth of 30m for pleasure dives – advanced divers or equivalent only. Maximum dive time of 50 minutes with a 5 minute stop at 5m before surfacing. For dives less than 10m same as above but 60 minute maximum dive time.</p> <p>Ensure that the dive procedures are audited every month throughout the season.</p> <p>Ensure that all boats carry oxygen supplies and that there are sufficient oxygen supplies to continue treating the patient throughout the period of the evacuation.</p> <p>Ensure that there is a qualified staff member who can administer oxygen.</p> <p>If a decompression problem occurs then the patient will be transported back to the marina and</p>

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			transferred to the recompression facilities in Nueva Gerona (maximum 2 hours)
Being hit by boat on surfacing	L	H	Surface slowly with arm raised and slowly turning to check for hazards.
Being stung by marine organisms.	L	M	In June and July there can be a bloom of marine organisms including jellyfish, ctenophores and juvenile polychaetes. Some of these can sting so students diving during this period should be told to bring a full length wetsuit and antihistamine cream. Anyone with a known allergy to marine life stings should inform the office prior to departure and the staff on site.
Being left in water at the end of a dive	L	H	All dive boat leaders operate a Roster system for each dive. Ensure that the Dive safety procedure is audited every month throughout the season. Ensure that all pairs of divers have a SMB with them for inflation at the end of the dive. Ensure that the boat roster is completed every dive.
Becoming separated from buddy	L	H	Ensure that all staff and volunteers are trained in the lost diver procedure.
Being carried away by currents or to greater depths by down currents	L	H	Ensure that risk assessments are completed for each dive site and used by all staff in dive planning. Ensure that the Dive Leader checks the conditions on the day before the group enter the water.
Barotraumas	L	H	All staff and volunteers informed of risk of barotraumas when diving and the safe equalisation procedure that includes aborting the dive if equalisation is not possible. All staff and volunteers to be informed that they should not dive with an upper respiratory tract infection. All staff and volunteers to be informed of the dangers of using decongestants when diving. Ensure all volunteers and staff are informed of the serious danger of holding your breath whilst scuba diving.
Injuries from dangerous marine animals	L	M	Ensure that all staff and volunteers are trained in the identification of all marine species likely to be encountered that can cause injury. Ensure that all divers are instructed never to touch the coral or any organism and do not cause an aggressive response from any marine creature by approaching too closely.
Factors present that increase risk of accident: Alcohol; Inexperienced divers; Medically unfit divers; Non operation of buddy system	L	M	Ensure that all staff and volunteers are advised to limit drinking alcohol when diving the next day and non compliance with this rule will mean the diver is out of the water for the following day. Ensure that all divers, irrespective of qualifications and reported experience are given a check dive by a Dive Instructor or Dive Master before joining the survey teams. All staff and volunteers to complete a medical questionnaire All dive procedures to be followed precisely. There must be at least 1 Dive Instructor AND 1 Dive Leader per 8 trainee students or 1 Dive Instructor if there are less than 4 trainee divers. For qualified divers there must be at least 1 Dive Leader per 6 students.

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			All accidents and near misses to be reported immediately to the Medical Officer who will compile the statistics and hold a staff meeting to discuss ways of avoiding further instances of accidents.
Tanks falling over on research vessel	L	L	Ensure all staff and volunteers are instructed to ensure tanks are secured or to lay them down at all times when they are not holding the tank.
Pressure gauge relief valve bursting	L	H	Ensure all staff and volunteers make sure that they turn on cylinder valves slowly and face the gauge away from them.
Dropping weight belts on feet.	L	L	Ensure all staff and volunteers are instructed to be careful when carrying weight belts and to lay them down whilst kitting up. Ensure all staff and volunteers make sure that weight belt clips are secure.
Slipping on the dive deck	M	M	Ensure that all staff and volunteers are aware of the risk of slipping while the boat pitches. They should hold on to handrails wherever possible and exercise caution while moving around the vessel - especially if they are if they are fully kitted up ready to enter the water
Falling over whilst getting into & out of dive boat with equipment.	L	M	Make sure that all staff and volunteers hand equipment to someone on the boat with care and make sure it is secure in the boat. Staff and volunteers should take care when exiting or climbing back onto the boats.
Control measures not implemented	L	M	Local Opwall coordinator to be responsible for auditing the control measures on a regular basis (see relevant audit form). These audit reports including details of non compliances and corrective measures to be available for inspection on site

2011 – G4 Medical support

Risk	Likelihood of occurrence during expedition	Severity of occurrence	Control Measures
Lack of available medical support increasing the risk posed by expedition activities	L	M	24hr medical centre with professional medical staff at the Colony throughout the expedition. An Opwall appointed medical officer to be based on the Felipe Poey Research vessel throughout the expedition so that any medical incidents in remote areas can be quickly treated. Dive boats to have first aid kits and all boats to have communication with the Colony Hotel.

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Lack of feedback system to reduce accidents and illnesses	M	M	The Country Manager to record the number of accidents, near misses and illnesses over the course of the expedition into 7 categories of seriousness and to hold bi-monthly meetings to discuss how risks can be reduced further. At the end of the season it is the responsibility of the Country Manager to prepare a report quantifying the accidents and illnesses in each of these 7 categories for publication on the web site.
Control measures not implemented	L	H	Local Opwall coordinator to be responsible for auditing the control measures on a regular basis (see relevant audit form). These audit reports including details of non compliances and corrective measures to be available for inspection on site

2011 – G5 Hurricanes

Risk	Likelihood of occurrence during expedition	Severity of occurrence	Control Measures
Hurricanes	M	H	The Cubans have an excellent national system of hurricane alerts and the government organises evacuation of all people in the path of the hurricane to safe areas. As a result despite being hit by numerous hurricanes over the last few years there have been virtually no casualties – in contrast with the hurricane record of other Caribbean islands. The Cuban Civil Defence will also communicate severe weather warnings to all vessels.