

Young Blake Expedition to the Kermadecs – August 8th – 19th 2012



Experiencing Marine Reserves (EMR) – Snorkel Plan - *Rangitahua*

By Samara Nicholas - Mountains to Sea Conservation Trust – Experiencing Marine Reserves programme

Reviewed by Dr Roger Grace. Feedback incorporated from Clinton Duffy, Tom Trnski, Malcolm Francis, Sir Peter Blake Trust, Department of Conservation & NZ Navy

Aim

To experience snorkeling in one of the most pristine ocean environments of the world.

Outcomes

- ✓ Team building exercise & leadership
- ✓ Identification of marine life found at the different snorkel sites around Raoul Island
- ✓ Identification of endemic species
- ✓ Detailed snorkel log of the different sites
- ✓ Stories of positive encounters with top predators
- ✓ Detailed location (GPS) and population inventory of spotted black grouper
- ✓ Behavioral observations of marine life

Role of Experiencing Marine Reserves

Responsible for decision making around the snorkel activity. All participants to follow our briefings and in-water instructions.

Target Group

30 year 11-13 students – minimum previous snorkel experience at the Poor Knights Islands
Adult supervisors – experienced snorkelers, fully briefed in safety & guiding protocol

Ratio Requirements

The in-water supervisor/student ratio is a minimum of 1:3, with a maximum group of 6 students in each snorkel group.

For each snorkel there will be a minimum of 2 adults dedicated to supervision of snorkeling students (1:3). Other participating adults will form a buddy group and follow instructions of snorkel director (Samara Nicholas) and/or supervisors. Extra in water support in emergency situation provided by our dedicated underwater photographer (and shark observer). One person from each group will be on board the anchored RHIB to supervise all snorkeling, ready for evacuation or **Emergency Procedure** under instruction of snorkel director and/or supervisors.

Equipment required: (based on board HMNZS Canterbury)

- ✓ Fins – assortment from XS – XL *These are all black*
- ✓ Mask & Snorkels x 50 *These are mostly black*
- ✓ Hooded vests to fit all – *Faded yellow*
- ✓ Weight-belts – All must be quick release and participants requiring them experienced in their use
- ✓ Long wetsuits to fit all
- ✓ Flotation ('boogie') boards x 6 – *yellow on top*
- ✓ Whistle x 20 – for all snorkelers in water and RHIB observer
- ✓ Small sharp knife (snorkel director) & cameras



- ✓ At least, 1 supervisor to carry a safety sausage and tourniquet
- ✓ Writing board

Equipment to be based on Navy RHIB

- ✓ First Aid kit – specialised & portable (emergency blankets, suitable wound dressings etc)
- ✓ Communication devices
- ✓ Dive flag – *for placement on RHIB*
- ✓ Flotation ('boogie') boards x 1 – *yellow on top*
- ✓ *Spare masks*
- ✓ Whistle x 1 – for RHIB observer
- ✓ Throw line

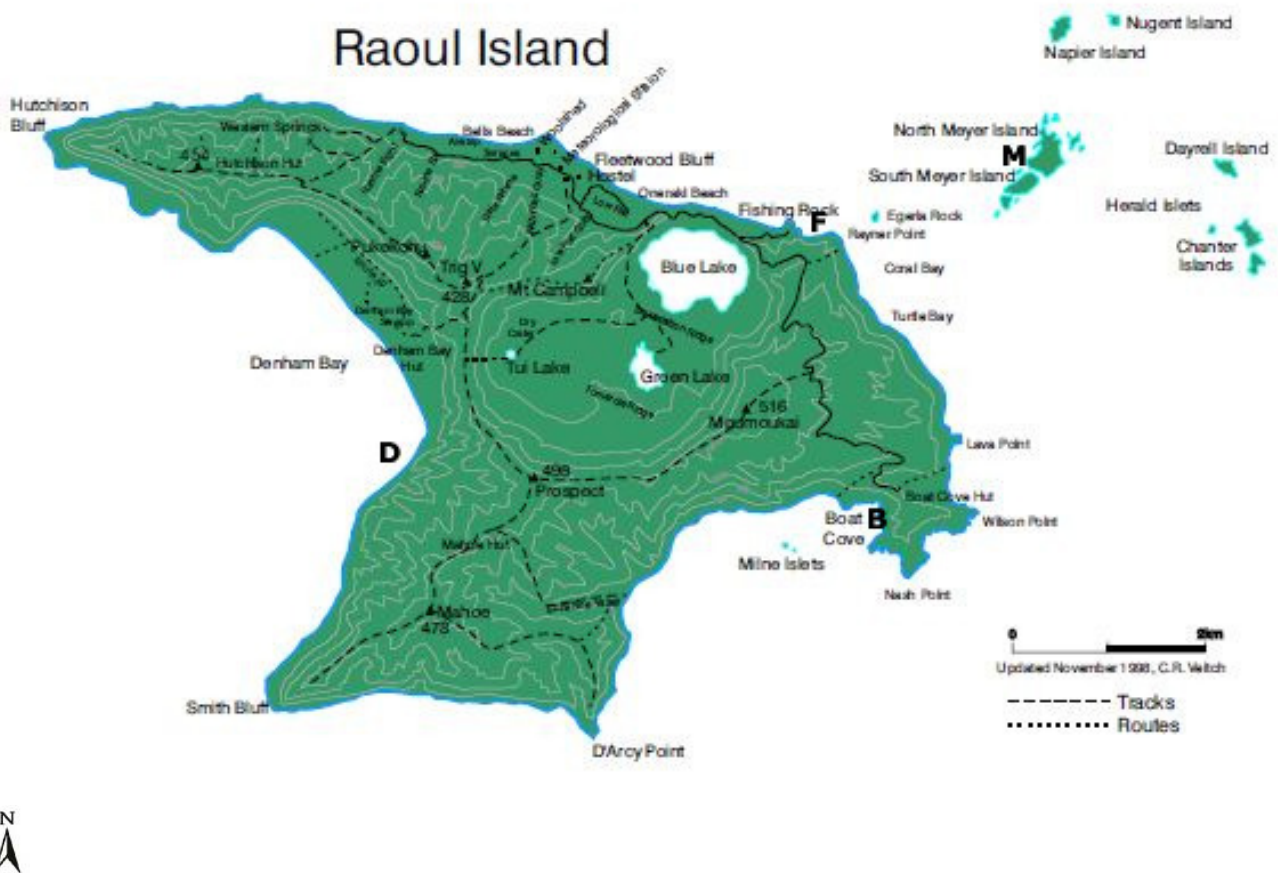
Programme

11th August - Raoul Island activities start

Each snorkel is a half day activity or 4 hours

- Briefing on board Canterbury – 30min
- Equipment fitting and checking on board – 30min
- RHIB brief by Navy (this should include how to enter the water) and transfer to snorkel site – 30min or 45min to location B or D (depending on location of the Canterbury)
- Snorkel – 1 hour
- RHIB Transfer – 30 – 45 min
- Debrief and reflection on board Canterbury - 30 min

Site summaries for snorkel location selection:



Suitable Snorkel Sites

Site M - Meyer Island – Sheltered from SW, no good in NW, although eastern side may be sheltered

- M1
- M2

Site F - Fishing Rock – Sheltered from S, no good in N conditions

- F1
- F2

Site B - Boat Cove - Sheltered from N, NW, NE (SE, B3 may have some shelter) no good in SW conditions

- B2 (only in perfect no swell, or surge conditions)
- B3

Site D - Denham Bay – Sheltered from E, no good in W conditions

- D2
- D3

Note: Exposed sites, points and headlands dropping into deepwater, and offshore rock stacks and reefs (e.g. Dougal Rock., Napier Island, the passage between the Meyer Islets and Raoul Island, Parson's Rock will be avoided.

Introduction to Raoul Island Marine Environment

Situated between mainland New Zealand and Tonga, the remoteness and subtropical location of the Kermadecs have combined to forge unique flora and fauna. Ocean currents approach the Kermadecs mostly from the West and the prevailing winds are from the South West.

The reef communities are transitional between tropical coral reefs and temperate rocky reefs. Algae forests, common along mainland NZ are absent and instead rock faces are covered in turf forming algae. Individual hard corals are common. Intertidal and shallow subtidal rock faces down to three meters are dominated by giant Kermadec limpet. The planktivorous demoiselle and Kermadec demoiselle are the most common reef fish. There is only one triplefin known to the Kermadecs and it is endemic. Two large predators play a major role on the Kermadec reefs, the Galapagos Shark and the spotted black grouper, in which the Kermadec Islands support the only remaining large population in the world.

Galapagos sharks (*Carcharhinus galapagensis*) are the most abundant shark species occurring around the islands, and can occur in large numbers at some sites. They occur in all inshore and offshore habitats can be expected to be encountered on almost every snorkel at the Kermadecs in numbers ranging from one or two individuals to more than 20 at a time. This species reaches a maximum reported size in excess of 3 m total length (TL). Clinton Duffy has never encountered one larger than 2.1 m TL at the Kermadecs. Most have been between 80 cm and 1.5 m TL.

Other species of large, potentially dangerous sharks recorded from the Kermadecs include:

- oceanic whitetip shark
- tiger shark
- blue shark
- hammerhead shark
- mako shark
- great white shark



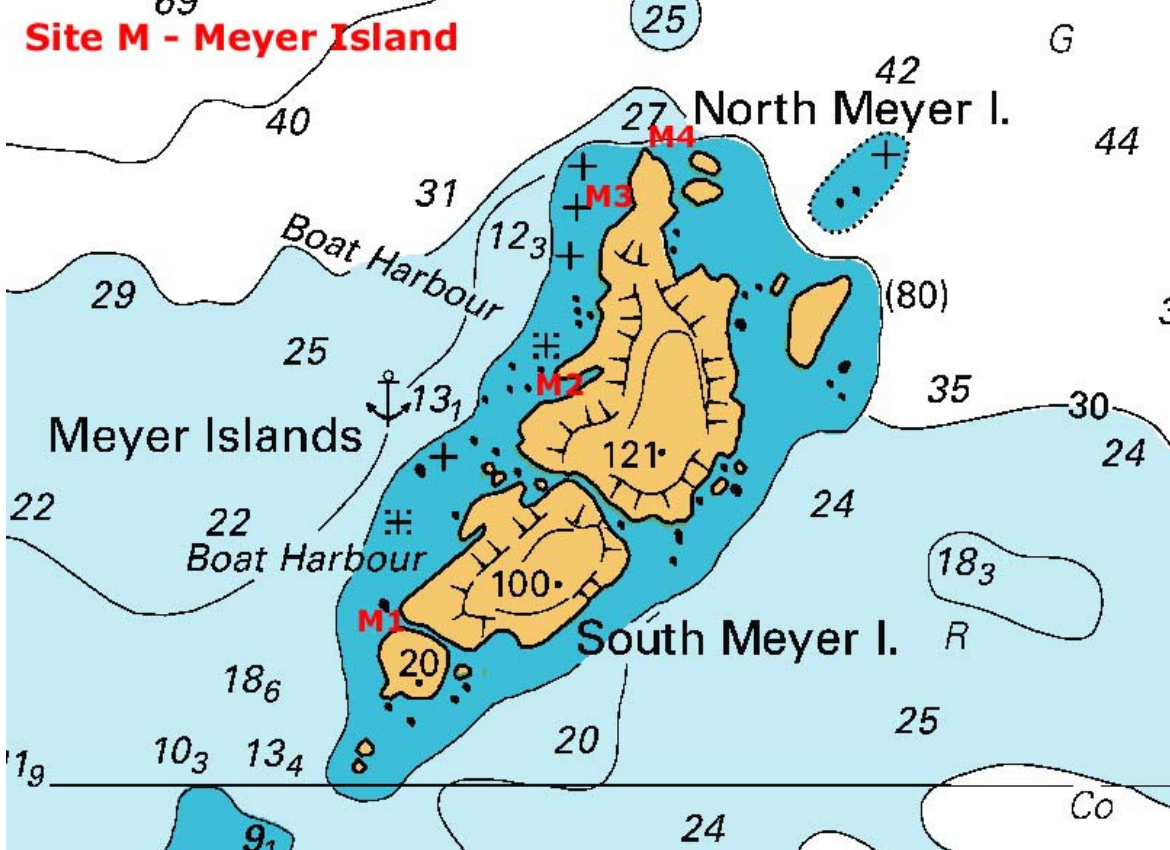
The Kermadec Islands marine reserve was established in 1990, and protects the waters out to 12 nautical miles. ALL MARINE LIFE (including non-living such as shells and rocks) IS COMPLETELY PROTECTED



Photos by Roger Grace

Environment Details for varied site options:

Site M - Meyer Island



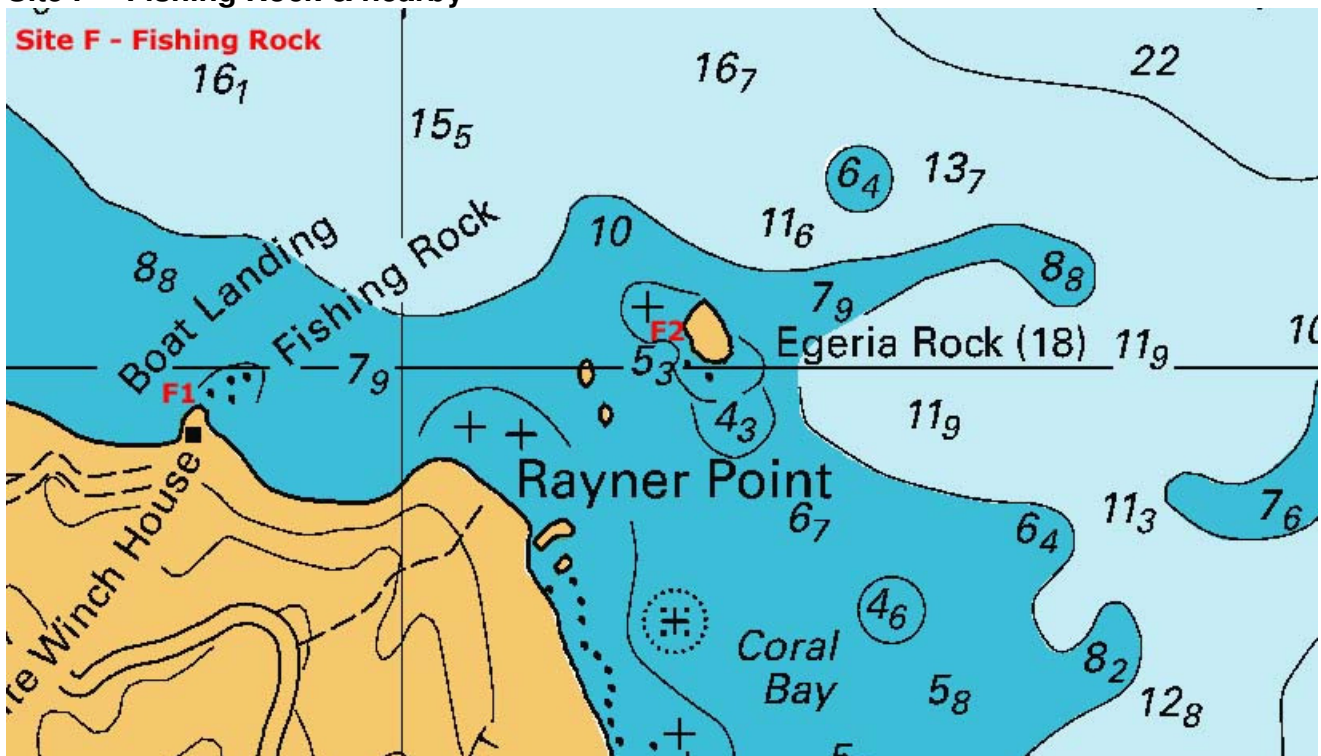
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The western side of Meyer Island is sheltered from prevailing SW winds. The shore has broken rocks and gullies, which provides for a variety of corals and fishes. Down from 6m, the rocks slope gently down to a bottom of over 20m, where it is good anchoring.

- ☺ **M1:** The shallowest part of the island descends to 10m. Stay on the Western side; avoid the southern point due to currents.
- ☺ **M2:** The inlet in the rocks here should provide good shelter; the eastern side opposite to M2 may also be suitable. This is likely to be our main target snorkel site. There is also a rock pool at this site. Due to currents, avoid going closer than 150 meters to either southern or particularly northern ends of the island. All along the western side is suitable, but avoid the ends.
- ☺ **M3:** This is the deeper part, steeply descending to over 20m. Avoid snorkeling in this area.
- ☹ **M4:** Very deep, not a suitable snorkel site, this area can have very strong easterly currents.

Site F – Fishing Rock & nearby

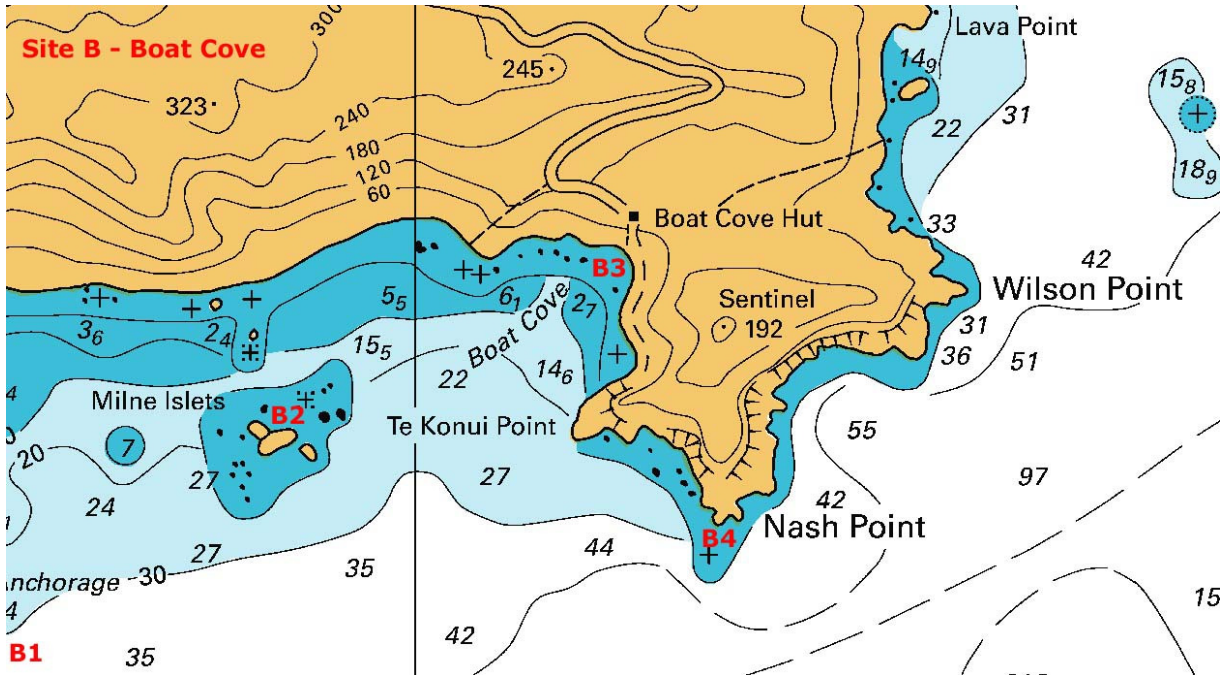


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- ☺ **F1:** This is the landing zone for the Island. This site would not be an option if wind/swell coming from the North, but has shelter from Southerly winds. Spotted black grouper are common in depths of 3 -6m. Good anchoring at around 15m. Groupers are often found where sandy bottom meets the rocky reef
- ☺ **F2:** Egeria Rock. Good along the western side, though a bit limited in area for an hour-long snorkel. The rock itself drops steeply into the water but there are shallow reef areas on the western side. Roger Grace has not encountered currents in this area.



Site B - Boat Cove

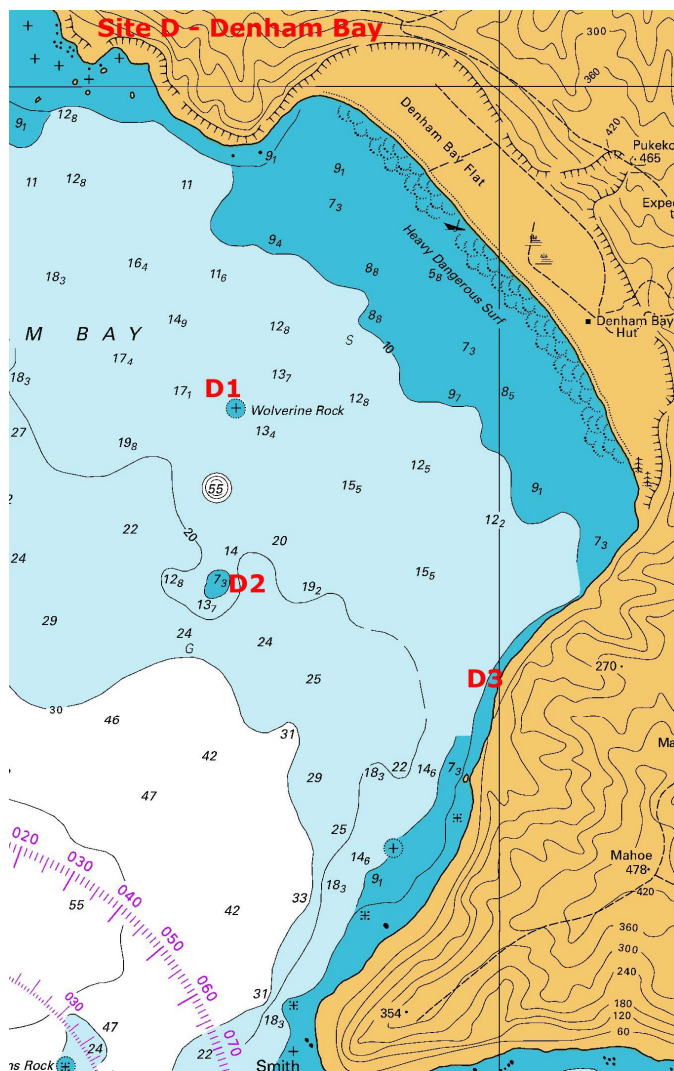


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Boat Cove on Raoul SE side, sheltered when swell and wind from the NW. It is good anchoring on the flat sandy/gravelly bottom at 17m depth.

- ☹️ **B1:** Outside the map lies Dougall Rock, with deep dropoffs and a deep gully rising to shallow water. Not an option for snorkeling.
- ☹️ **B2:** Milne Rocks are suitable for snorkeling, when conditions of no swell or surge, the rock mostly drops off steeply to 15 to 20 meters. Jinx (Spotted black grouper) lives close to these rocks.
- 😊 **B3:** Shallow & sheltered. This would be the preferred spot!
- ☹️ **B4:** Nash Point juts out in the current and often has schools of pelagic fish. Probably avoid, unless you have a very experienced group keen to jump in with school fish. Keep the inflatable close to the group and don't attempt to anchor.

Site D – Denham Bay



Source – Land Information New Zealand

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Denham Bay consists of large sandy flats around the crater. Sheltered from easterly winds and swell. Denham Bay has a steep gravelly beach which should be avoided.

- ☹️ **D1:** Wolverine Rock has a lot of volcanic activity. May or may not be visible, it apparently appears and disappears at the whim of the most recent eruption. Not a suitable snorkel site option.
- ☹️ **D2:** Short tailed stingray breeding ground. Some areas here are shallow and OK for snorkeling. Interesting in that the soft pumice rock is very fresh and does not have a lot of attached life or coral. You will see fish and urchins and feather stars but few corals. Roger Grace watched a pair of short-tail stingrays doing a pre-mating ritual here for over an hour. The male was holding on to the trailing edge of the female's wing as they cruised around together.

☺ **D3:** Reasonably steep coast, descending to 15m. All along this shore from the beach to the point is good snorkeling. Some is bouldery and some solid rock. Solid rock is generally more interesting.

Activity **Snorkeling – Raoul Island**

Medical clearance and permission to attend the trip and participate in snorkeling

EMR snorkel leader Group	Samara Nicholas	Date	11 – 16 August 2012
	Young Blake Expeditions	Location	<p>Site M - Meyer Island – Sheltered from SW, no good in NW, although eastern side may be sheltered</p> <ul style="list-style-type: none"> ▪ M1 ▪ M2 <p>Site F - Fishing Rock – Sheltered from S, no good in N conditions</p> <ul style="list-style-type: none"> ▪ F1 ▪ F2 <p>Site B - Boat Cove - Sheltered from N, NW, NE (SE, B3 may have some shelter) no good in SW conditions</p> <ul style="list-style-type: none"> ▪ B2 ▪ B3 <p>Site D - Denham Bay – Sheltered from E, no good in W conditions</p> <ul style="list-style-type: none"> ▪ D2 ▪ D3

Risks (potential losses)

1 Physical Injury	4 Loss of life
2 Environmental factors	5
3 Gear/Equipment	6

Causal factors (potential risks)	Risk reduction strategies
<i>People</i> Skills Attitudes Age Fitness Ratios Inexperience Health Inappropriate behavior Inadequate supervision Existing medical conditions	Careful selection of the best location based on the forecast and conditions on the day. Use suitably trained, experienced & qualified adult guides. Experience and skills of snorkel leader and in water supervisors. Snorkel & swimming ability already checked. Clear guidelines given to students before snorkel and identification of potential hazards, such as sharks, surge and/or current. Briefing on snorkel site and snorkel procedure. Boundaries, snorkel route and entry and exit points made clear. This includes staying in the immediate vision of the RHIB. Recall system explained for aggressive behavior of

<p>Sunburn Fall on rocks Washed into rocks Panic Drowning Cramp Exhaustion Colliding with another diver Hypothermia Shallow water blackout Seasickness</p>	<p>sharks. Students to stay in immediate proximity of designated adult supervisor & buddy group (one arm's length away). Adequate supervision ensured by adult staff – adult: student ratio aim of 1:3 All supervising adults in the water must be experienced. All buddy groups to take body board for extra buoyancy and visibility. Brief on danger of hypothermia and how to avoid. Group to comply with instructors directions while in water. Adult observer based on RHIB, ready to communicate with Canterbury. Number check before and after snorkel. Seasick pills to be provided by individuals.</p>
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<p>Equipment Inadequate wetsuit, leaky mask, faulty snorkel, no safety gear, being hit by a boat, other obstacle or equipment. Choking or other problems associated with breathing in</p>	<p>Use of Dive flag. Equipment checked and fitted Use of body boards</p>
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<p>water down the snorkel. Outboard cuts. Risk of human contact with RHIB or any other engine propeller.</p>	<p>Buoyancy check Stay clear of RHIB or any other propeller. Follow instructions of Navy crew.</p>
<p>Environment Unsuitable weather conditions, tides, currents, rocks, sharks, waves, rips. Weather changes creating adverse conditions. Damage to environment. Hazardous marine life, jellyfish , stingray, urchins, lion fish, crown of thorn starfish, coral, sharks, cone shells. Boats. Earthquake or Tsunami Changeable weather conditions</p>	<p>Up to date weather forecast. Sensible assessment of environmental conditions. Safe anchor & location of entry and exit points, depending on conditions. Identification of potential hazards (waves, rocks etc). Avoid areas known to have current. Avoid areas where we can not see the bottom. Care of environment instructions given. RHIB to stay close to snorkel group for quick evacuation. Knife to cut fishing line. Specialised first aid for treatment of injuries caused by hazardous marine life on board RHIB. No snorkeling at dusk or dawn or night. No collecting (permit only) of specimens. Refrain from splashing. No shinny jewelry. Avoid any fluorescent or day glow colored snorkel equipment or bare skin. Follow shark protocol covered in briefing. Expedition doctor in communication reach. EMR yellow faded hooded vests and yellow bright body boards (white underneath) will help RHIB identify snorkelers. Communication with HMNZS Canterbury for timely evacuation as a result of earthquake or evacuation to shore to make for higher ground in the possibility of Tsunami</p>

EMERGENCY PROCEDURE – Snorkeling Raoul & Meyer Island

Safety RHIB manned with non snorkeling crew member and on look out at all times, radio contact with main vessel - HMNZS Canterbury. Three whistle blasts or three taps on hull (or other hard surface) of RHIB to recall snorkelers

Snorkelers: Raise and wave one arm for help. Use whistle to gain attention (three blasts).

In the event of unforeseen dangers at sea, for example marine life or sea conditions changing, calmly organise evacuation to RHIB or the nearest safe landing point. Preliminary care on board RHIB. Once all snorkelers on board (number off), RHIB proceeds to secondary care on Canterbury.

Expedition doctor in communication reach

Raoul Island monitors radio frequencies: VHF Channel 16 and SSB 4.417 MHz.



EMR Raoul Island Briefing checklist

Previous day:

- Check swell and wind direction forecast
- Decision on best site

Morning of snorkel:

- Finalize decision on site and inform comms controller

Warm up

- Ascertain students' and adults' mood – make sure everyone feeling good about the snorkel
- Inform group of destination for the days snorkel
- Check understanding of 'EMR Water Safety' and marine reserve rules (no touching sea turtles)
- Discuss expectations of what marine life may be present—prepare for likelihood of seeing sharks
- SHARK PROTOCOL. These sharks may exhibit lack of fear and may approach us out of curiosity. Snorkel group to stay close together at all times and within 1 arms length of buddy group. Minimum of 1 push stick to be carried by group. If aggressive shark behavior displayed (watch for back arching and dropping of the pectoral fins, rapid movements towards snorkelers or build up of shark numbers throughout snorkel) - 3 whistle blasts to evacuate snorkel back to RHIB or nearest safe landing point. Try not to get in between the shark and the reef, avoid getting in tight gullies. All participants briefed on likelihood of seeing sharks. Someone that experiences panic should be evacuated with buddy group. Avoid splashing. If anyone is cut, they should abort with buddy group. GUIDES BREIFED ON THIS PROTOCOL. If an oceanic whitetip, tiger shark, mako or great white shark were sighted the dive should be aborted
- Discuss snorkel outcomes and marine environment to be encountered
- Check ratio's and buddy groups
- Advise students/supervisors that warm clothes and snack should accompany them on the RHIB (day bag)

Equipment fitting

- Advise the group to clean their masks (clean off de-fog) before putting them on, wear around neck
 - Fins, to be tried on, then fitted again before entry
 - Wetsuit & hooded vest fitted
- Receive instructions from Navy crew with regards to RHIB protocol

Once at location



- Entry point & snorkel route & boundaries
- Number check in water
- Use of dive flag on RHIB
- Buoyancy check for those wearing weight belts – advise buddies of quick release location
- Advise on safety issues (hazards)
 - Currents
 - Waves
 - Sharp rocks
 - marine life – sharks, jellyfish, kina, lion fish, crown of thorn, spotted black grouper, eagle rays etc
 - Cone shell - *Conus textile*, one of the species whose toxin is considered ‘extremely dangerous to humans.’ These look pretty but under no circumstances should they be picked up, even if the shell looks dead/empty.
 - temperature
 - Visibility.
- No touching any marine life at all!
- Buddy system to be maintained at all times – one arms length – 1:3 ratio, with 1 board per group, staying together as a group AT ALL TIMES
- Use of hand signals
 - Ok, ok on surface, up, down, non urgent, urgent attention (to recall the RIB for pick up)
- Check numbers exiting water
- Water evacuation procedure** - 3 whistle blasts to evacuate snorkel back to RHIB or nearest safe landing point, preliminary first aid administered if appropriate, and transfer to secondary care on board the Canterbury.
- Emergency procedure**

Safety RHIB manned by non-snorkeling crew member and on look out at all times, radio contact with main vessel - HMNZS Canterbury

Snorkelers: Raise and wave one arm for help. Use whistle to gain attention.

In the event of unforeseen dangers at sea, for example marine life or sea conditions changing, calmly organise evacuation to RHIB or the nearest safe landing point. Preliminary care on board RHIB. Once all snorkelers on board (number off), RIB proceeds to secondary care on Canterbury.

Expedition doctor in communication reach

Raoul Island monitors radio frequencies: VHF Channel 16 and SSB 4.417 MHz.

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Expedition snorkel director qualifications

Samara Nicholas Creator and founder of Experiencing Marine Reserves, original trustee of Mountains to Sea Conservation Trust and current Programme Director. Recognised in 2005 in the Sir Peter Blake Leadership Awards. Holds Bachelor of Applied Science degree from AUT and is a graduate of Northland Polytechnic's Diploma of Environmental Management. Samara is a PADI Divemaster, NAUI Skindiving instructor and registered assessor for unit standards in snorkeling. Samara has 20 years snorkel experience and 11 years of professional snorkel guiding experience in locations all over NZ.

Underwater photographer and evacuation supervisor

Steve Hathaway

PADI advanced diver, OSH Film/ photography commercial divers' cert. Over 8 000 hours snorkeling and diving experience. Very experienced with sharks, large marine animals and snorkeling in big currents on exposed coastlines and open ocean in testing conditions. Professional underwater cameraman, shot for BBC, Discovery and had footage used for national and international documentaries and shows.

Snorkel Supervisors (all with suitable snorkel experience and qualifications)

Paul Scott – Group 1
Andrew Penny – Group 1
Helen Bostock – Group 2
Clinton Duffy – Group 3 and whenever possible
Libby Liggins – All groups – especially 3 & 4
Hannah Prior – Group 4
Isaac Sutherland – Group 5
Stephen Ullrich – Group 5

Adult Participants

Chris Mace
Sam Johnson
Mark Weldon
Sheelagh James
Michael Moyes
Virginia Larson
Rebecca Priestley
Pete Sommerville
Peter Cronshaw
Charles Toogood
David Pierce
Rochelle Constantine
Bruce Foster



William Mansfield
Don Robertson
Andrew Berry
Phil Brown

EMR WATER SAFETY

These are some of the serious conditions that can occur when snorkel diving.

Barotraumas

This is an injury due to unequal pressures between a space inside the body and the ambient pressure or between two spaces within the body.

The most common type of barotraumas experienced by snorkelers is ear pain or ear “squeeze”. It is caused by the difference in pressure between the air spaces of your ears and mask and the higher water pressure as you dive deeper underwater.

This can be prevented by equalizing the pressure in your ears by gently blowing against your pinched nose. Tilting the head back, yawning and moving the jaw around may also help as it will open the Eustachian tube more making equalizing easier. Chewing menthol gum before a dive can help as it also opens the Eustachian tube.

Descend and ascend gradually, gently equalizing ear pressure on the way down.

Do not attempt to dive with cold or blocked sinuses, as you will struggle to equalize.

If you feel any pain, discomfort or dizziness while snorkel diving, get out of the water. Inform snorkel leader **See Emergency Procedure**

Hypothermia

Hypothermia is caused when the core body temperature drops to a point it can not recover from (below 35 degrees C). As the blood cools it affects the organs to which it flows and their normal functioning. When the body drops below 26 degrees C death occurs.

Early warning signs are:

- tiredness
- feeling cold and shivering
- slurred speech
- loss of coordination, stumbling, clumsiness
- changes in behavior – anxious, irritable, irrational

Later more serious signs are:

- shivering stops
- unconsciousness

When diving, hypothermia can be prevented by wearing a suitable wetsuit for the water temperature. A wetsuit hood is very beneficial as up to 50% of body heat is lost through the head. **See Emergency Procedure**

Put on dry, warm clothes and a woolen hat.

Keep the person lying down (if possible) and warm with emergency blankets.

Hyperthermia



This is the general name given to a variety of heat related illnesses. It occurs when the body temperature rises above what is normal.

It is the opposite of hypothermia meaning the body can not cool itself to a normal temperature. The two most common forms of hyperthermia are heat exhaustion and heat stroke. Heatstroke is especially dangerous. **See Emergency Procedure**

Hyperventilation

Hyperventilation or over breathing is when the breathing rate or depth is increased. It can be triggered by anxiety.

Signs and symptoms include numbness, tingling and spasm in the hands.

To manage hyperventilation:

- reassure the casualty
- sit them down and stay with them
- encourage them to take deep, slow breaths

Shallow water blackout

This is the sudden loss of consciousness caused by oxygen starvation.

It occurs most commonly after the diver has been hyperventilating on purpose to increase his time underwater.

Hyperventilating reduces carbon dioxide levels in the blood.

It is carbon dioxide that stimulates the need to breathe. So with reduced levels of carbon dioxide in the blood, the diver may not realize his body desperately needs oxygen until it is too late.

To be safe, spend as much time on the surface between dives. Watch your dive buddy at all times. If your dive partner blacks out, remove their weight belt immediately to achieve buoyancy.

See Emergency Procedure

Buoyancy

When snorkeling, we aim to have neutral or slightly positive buoyancy.

This allows us to stay on the surface with minimal energy while also allowing you to dive easily. When buoyancy is neutral, the diver should float on the surface when the lungs are full of air, then slowly sink as they exhale.

Because we wear wetsuits to keep warm and protect us, we can counteract this extra flotation with a weight belt. We must always check ourselves for neutral buoyancy upon entering the water and adjust our weight belt accordingly.

If you notice a diver struggling to reach the surface, the first thing to do is remove their weight belt.

Near drowning

If someone has nearly drowned, it is likely they will be struggling to breathe if breathing hasn't already stopped. They may be frothing at the mouth and show little or no response.

See Emergency Procedure

A near drowning casualty must be seen by a doctor, as they may have water in their lungs which can cause secondary drowning.

Minor aquatic injuries

Most minor aquatic injuries can be treated with your first aid kit for bumps, scrapes and stings. Keep the person warm and comfortable and monitor their condition. **See Emergency Procedure**

Major aquatic injuries



- **Sharks** The chances of being attacked while snorkelling is very slim, however attention should be given to the mood of the shark/s. **See Shark protocol, Water Evacuation Procedure & Emergency Procedure**
- Treatment for bite wound would be control of bleeding & shock. Measures to control blood loss include pressure and tourniquet. **See Emergency Procedure**

- **Lion Fish**
 The lion-fish belongs to the Scorpion fish family.
 This brightly coloured fish is usually found in coral reefs, especially in shallow waters hovering in caves or near crevices. Lion-fish have venomous fin spines that can produce painful puncture wounds. Fatalities, however, are rare. The fish have elongated dorsal fin spines and enlarged pectoral fins, and each species has a particular pattern of zebra like stripes. A person punctured by one of the sharp spines will immediately feel strong pain. Rapid swelling of the affected body area develops along with the possibility of making movement of limbs very difficult. Lion-fish stings can cause nausea, breathing difficulties, paralysis, convulsions and collapse. Even death may occur in exceptional circumstances. **See Emergency Procedure.** Most people survive in spite of the great pain. The venom in the spines remains active for days, so even discarded spines should be treated with caution. It may take several months for a full recovery and if the sting is left untreated, gangrene may develop. **Refer to expedition doctor**

- **Crown of Thorns** - the starfish's long spines (which release a neurotoxin) are capable of pricking and stinging, inflicting great pain that can last for hours, as well as nausea and vomiting. Frequently, the area around the puncture turns a dark blue (erythema) and begins to swell (edema). The swelling may persist for a number of days or weeks. If you are pricked by a crown of thorns, it is important to ensure any remnants of the spine are completely removed. Risk of secondary infection **Refer to expedition doctor**
- **General First aid treatment for all venomous fish stings:** Remove any very loose spines. Spines that are embedded should be left until medical help is available. Avoid excessive tugging at spines as the tips may break off and be difficult to locate. Place the injured part into hot, but not boiling water. The temperature of the water should be tested by someone other than the patient before use. Apply local anesthetic around the wound to provide pain relief. Clean the wound, washing out with sterile hot saline solution. Dress and loosely bandage the wound. Arrange bed rest and antibiotic treatment as appropriate. Supervise any further pain relief.

Cramps A cramp is a painful muscle contraction often caused by cold temperatures or physical exertion. The affected muscle can be stretched and massaged to relieve the pain. Get the patient to lie down or sit comfortably while you work on the affected area.

A good calf muscle stretch is to pull the end of your flipper towards you gently while massaging the muscle with your other hand. **Water Evacuation Procedure**

Exhaustion Exhaustion often occurs due to excessive loss of body fluids and body salts.

The person may suffer from:

- headache
- dizziness
- rapid breathing
- feeling sick
- muscle cramps
- tired and restless



Refer **Water Evacuation Procedure**. The person should rest, lying down with their legs raised, if this is possible. They should be given cool, plain water to sip and their condition monitored. **See Emergency Procedure**

