Reef Alive! NE to Year 10 Term 2 – 4 2021



Credit: Triplefin. Photographer Kevin Bone (2020).

Thank you for visiting us. Attached is some information that we hope is useful to you on your return to the classroom.

#### **Key Questions**

#### Where is 'Project Reef'?

'Project Reef' and the surrounding, mostly unmapped sub-tidal reefs are composed of a variety of rocky substrates. They are located off the coast of Pātea in the temperate waters of the ocean area known as The South Taranaki Bight. The study reef has been unofficially nicknamed '*Project Reef'* by the passionate researchers from *Project Reef Life*. The reef is horseshoe-shaped, 23m deep, about 100m long, and located approximately 11 kilometres off the Pātea coast.

A 2006 report by the Department of Conservation titled <u>Netting Coastal Knowledge</u> noted the absence of knowledge and research in the South Taranaki Marine Area makes studies on the 'Project Reef' extremely valuable.

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#### What are the common life forms on 'Project Reef'?

New Zealand's rocky reefs in comparison with reefs in other temperate regions of the world have almost twice the number of species per unit area.

Colourful seaweeds (red, green and brown) dot the surface of *Project Reef* providing hiding places and mini homes for smaller creatures. Crabs and crayfish can be seen hiding in the cracks and crevices of the reef. Interestingly coral often associated with reefs are not found on the *Project Reef*.

Sponges are regularly found growing on the reefs rocky surface with 26 species so far recorded and many more still to be identified from photos and samples. Other organisms seen include Starfish, Sea Urchin, Jellyfish, Bryozoan (colony forming animals that look much like plants) and the unmistakable Sea Anemones.

Research using baited under water video cameras, a fixed underwater camera and diving surveys have helped detect 34 fish species many special to New Zealand (endemic). These include King Fish, Scarlet Wrasse, Sea Perch, Silver Trevally, Blue Moki and Blue Cod. Three sharks have been seen, Carpet Sharks (which are always there), Broadnose Seven Gill Sharks and recently a Great White Shark. The most iconic and abundant shallow- water subtidal reef fish in New Zealand are Triplefins. To date six of the known 26 species in New Zealand have been recorded at the *Project Reef* site.

### What are some of the challenges conducting research in the ocean at Project reef?

Conducting research at the reef site is reliant on several vital factors coinciding. A high tide and good weather is necessary to safely navigate the sand bar by boat. Suitable conditions underwater can limit what can be seen and achieved, particularly when swell and tidal currents are strong. Diving at a depth of 23m also has time limitations due to the air in the tank of divers.

Developing, using and deploying equipment, and conducting surveys provides further challenges in such a dynamic environment. A lot of trial and error has occurred to try and streamline getting equipment to work and surveys to be carried out in the allocated diving time.

### What kinds of research are being conducted on the reef?

Five survey methods are used in conducting the main research:

- 1. A camera fixed to metal struts on a pyramid is programmed to take short video bursts during the day and night.
- 2. Benthic (reef floor) surveys involving a diver taking photos of the reef along 30 metre transects.
- 3. Baited underwater video. An unobtrusive method to record size and relative abundance estimates of scavenger and carnivorous reef fish species.
- 4. Underwater sound surveys (acoustic) using a device (hydrophone) that detects sound waves.
- 5. Plankton trawls.

### Which parts of Taranaki's marine environment are in some form of protection?

Taranaki has a small percentage of its coastal waters in differing levels of protection.

The strongest level of protection are no-take areas known as a marine reserves. Taranaki has two marine reserves. Tapuae marine reserve (off New Plymouth) and Paraninihi marine reserve (located opposite the Whitecliffs walkway in north Taranaki).

The waters surrounding the islands knowns as the sugar loafs are protected in the form of a marine park. Ngāmotu/Sugar Loaf island Marine Protected Area which bans commercial fishing - except trolling for two fish species. It also prohibits activities that disturb the foreshore and seabed including mining and drilling as well.

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The West Coast North Island Marine Mammal Sanctuary stretches the length of Wellington to Maunganui bluff north of the Kaipara harbour and bans seismic surveying out to 12 nautical miles. It also does not allow people to place (out) set nets between two – four nautical miles between Waiwhakaiho River and the Pariokariwa point (edge of Paraninihi Marine Reserve). This sanctuary is targeted to help protect the highly endangered Maui dolphin but also benefits other marine mammals.

#### List some of the threats facing our oceans and coastal environments?

Humans are the dominant predator on planet earth negatively impacting on habitats on land and at sea. These include but are not limited to:

- <u>Climate change</u>: the burning of fossil fuels by humans since the start of the industrial revolution has upset the stable balance of the atmosphere resulting in more and more heat being trapped in the atmosphere, over 90% has been absorbed into the oceans. The flow on affects include:
  - Ocean heatwaves: Ocean heatwaves are areas of hotter water. They do not support as many fish and so penguins for example are being forced to swim further to catch fish. This is resulting in many nests being abandoned and chicks on land starving to death.
  - Increasing ocean acidity: Warmer oceans are causing the water to become more acidic. This negatively affects shell animals as acidic water breaks down the calcium carbonate in their shells.
  - Coral bleaching: Ocean heat waves are killing off coral reefs. Quote from movie *Chasing Coral (2017) "In less than 25 years it is projected the oceans will be too warm for coral to survive and they will die out"*.
- <u>Underwater sound pollution</u>: Many marine mammals communicate underwater using sonar which can get drowned out due to busy shipping and boat activity. This noise causes stress to marine mammals and can prevent them from communicating. Research also shows it can cause whale strandings.
- o <u>Over fishing</u>: Recreational and commercial over fishing of stocks of fish (legally and illegally).
- <u>Shark hunting</u>: The cruel practice of hunting sharks for their fins is rapidly depleting the world's shark species. In a recent study (<u>Nature, 2021</u>) of 18 oceanic shark and ray species 71% had declined since 1970 levels. 14 of which are now facing extinction due to increasing fishing pressure.
- <u>Contamination:</u> Due to oil spills, plastic –micro and macro.
- <u>Sedimentation</u>: When soil runs off the land into rivers and streams and out to sea smothering and suffocating marine life.

#### How do we help the oceans?

The answer to this is not simple but one way is to see how action can be undertaken. Action can be taken on a personal, local, regional, national and global scale. All of these levels are required for change to occur. Personal action alone is not enough given the momentum and scale of destructive processes affecting ocean life and health.

Something really inspiring is the power of allowing nature to heal itself. In January 2021 a coalition of 50 countries committed to protect almost a third of the planet by 2030, to halt the destruction of the natural world and slow extinctions of wildlife. The High Ambition Coalition (HAC) for Nature and

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People, which includes countries from six continents, made the pledge to protect at least 30% of the planet's land and oceans (New Zealand did not sign the coalition). Currently only 15% of the world's land and 7% of the oceans are protected.

In the words of Greta Thunberg (Swedish environmental activist) - "I want you to act as if the house is on fire, because it is."

## Weblinks or links

- <u>Project Reef South Taranaki</u> (includes lots of videos and information on Findings of *Project Reef Life*). Also includes contact information for an <u>in-class lesson with a Project Reef Team educator</u>.
- <u>New Zealand Geographic Triplefins</u>
- <u>Science Learning Hub investigating-life-in-the-sea-introduction</u>
- Marine protection in Taranaki
- Marine Reserves A -Z
- Blue whale study finds special New Zealand link
- Evidence for unrecognised blue whale foraging ground in New Zealand (powerpoint)
- Little penguins and other seabirds in the South Taranaki Bight
- <u>'Genetically distinct' blue whale population discovered off South Taranaki Bight.</u>
- <u>Movie: My Octopus Teacher</u> official trailer.
- <u>Movie: Chasing Coral</u> official Trailer.
- <u>30 x 30 Ocean Unite the 30X30 is a call to action to safeguard at least 30% of the world's oceans by 2030.</u>
- <u>Protecting our marine world (D.O.C Education Unit)</u> Great school activities and resources

### Puke Ariki Library:

- Neil, Andrew. *The living reef: the ecology of New Zealand's rocky reefs* (2003), Craig Potton Publishing, Nelson, N.Z.
- Francis, Malcolm. *Coastal fishes of New Zealand* (2012), Craig Potton Publishing, Nelson, New Zealand.

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