

Phoenix Islands Conservation Survey 2013

Marine Survey Short Report

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Summary

Marine investigations and monitoring work were carried out as part of the 2013 Phoenix Islands conservation survey lead by Dr Ray Pierce. On this trip the priority objectives were based on terrestrial work leaving only limited time and opportunity for marine survey. In cooperation with the NEAQ team we prioritized our marine work around large fish abundance and coral health assessments at key permanent monitoring sites established previously by the NEAQ team. These monitoring sites were also used for the author's previous survey (Kerr & Wragg, 2006). Six of the Phoenix Islands were surveyed; omitting Rawaki and Manra. Where possible beaches were surveyed for turtle nests and tracks and records were kept of all marine mammal sightings. On the return voyage to Samoa we stopped off at the Tokelau Island, of Atafu where a snorkel dive and one scuba dive was undertaken.

Ten scuba and seven snorkel survey dives were completed. Rapid assessment survey results for large fish were generally consistent with the NEAQ results of the 2000 and 2002 expeditions and the author's previous survey Kerr and Wragg, (2006). Coral health observations were also roughly consistent with previous surveys. No significant coral bleaching symptoms were observed.

A significant result from this survey was the observations of coral health at McKean atoll where recovery of coral is not taking place in any significant way. McKean has in the past had very low assessments of coral cover and health but with less visits and survey effort than some of the other atolls. McKean typically has had coral cover percentages estimated at less than 10-20 %. From our observations of this recent trip it is believed that coral health and cover at McKean has deteriorated further or at least shows little or no sign of recovery. If a past bleaching event had been the cause of this poor coral condition we would have expected to see signs of recovery or of subsequent bleaching events but these were not in evidence. Instead dense mats of algal cover were present in all locations observed. These observations lead to a hypothesis that the iron bleaching from the Taiwanese fishing trawler on the McKean reef is preventing recovery of the coral on this atoll. Evidence for this hypothesis will be discussed further in a report when the survey imagery has been analyzed.

Marine survey details

Due to the limitations of time and of the anchorages used we concentrated on lee shore outer reef edge and slope habitats. We also recorded observations of marine mammals and turtles throughout the expedition. Tables 1 below details the dive sites and individual survey dives completed for each island visited.

Phoenix and Tokelau Islands surveyed (Leeward outer reef or indicated as lagoon)						
Island	Dive site	# of scuba dives	# of snorkel dives	Latitude	Longitude	Date
Enderbury	Observation spot	2		S 3 8.539	W 171 5.549	14-May
Canton lagoon	K11 coral castles	1		S 2 48.314	W 171 42.388	15-May
Canton lagoon	vk 008		1	S 2 48.907	W 171 42.490	16-May
Canton lagoon	vk 009		1	S 2 48.850	W 171 42.449	16-May
Canton lagoon	vk 010		1	S 2 48.711	W 171 42.507	16-May
Canton lagoon	vk 011		1	S 2 48.037	W 171 42.452	16-May
Canton lagoon	vk 012		1	S 2 48.205	W 171 42.818	16-May
Birnie	Puff magic	1		S 3 35.363	W 171 31.093	17-May
Birnie	vk B5	1		S 3 35.139	W 171 31.233	17-May
Orona	Transition reef	1		S 4 30.683	W 172 13.531	20-May
Orona lagoon	AA1 Lagoon site		1	S 4 29.917	W 172 9.450	21-May
McKean	Rush hour	1		S 3 35.520	W 174 7.650	22-May
Nikumamoro	Amelia's lost causeway	1		S 4 40.477	W 174 32.616	24-May
Nikumamoro	Norwich city	1		S 4 39.652	W 174 32.847	24-May
Atafu, Tokelau	Anchorage	1	1	S 8 32.634	W 172 32.222	27-May
Totals		10	7			

Table 1. Islands visited, survey site names and locations and dives completed

Methods

The rapid survey methods used were adapted from the methodologies described in the New England Aquarium 2002 expedition (Obura and Stone 2003), and are described below along with some minor modifications and additions. All SCUBA and snorkel dives were carried out by Vince Kerr. Methods for the large fish abundance 30 minute swim counts are described in Kerr and Wragg (2006). The methods used are consistent with past surveys done by the NEAQ teams.

Large Indicator Fish Abundance (30 minute swim)

Twenty-one species of large fish species have been selected as being potential indicators of fishing activity and other impacts on the coral reef ecosystem.

Family	Scientific name	Common name
Scombridae	<i>Gymnosarda unicolor</i>	Dogtooth tuna
	<i>Euthynnus affinis</i>	Mackerel tuna
Carangidae	<i>Scomberoides lysan</i>	Doublespotted queenfish
	<i>Elegatus bipinnulata</i>	Rainbow runner
	<i>Caranx sexfasciatus</i>	Bigeye trevally
	<i>Caranx malanpygus</i>	Bluefin trevally
	<i>Caranx lugubris</i>	Black trevally
	<i>Caranx ignobilis</i>	Giant trevally
	<i>Chanos chanos</i>	Milkfish
Sphyraenidae	<i>Sphyraena genie</i>	Chevron barracuda
	<i>Sphyraena barracuda</i>	Great barracuda
Labridae	<i>Cheilinus undulatus</i>	Napoleon wrass
Serranidae	<i>Epinephelus fuscoguttatus</i>	Brownmarbled grouper
	<i>Plectropomus laevis</i>	Blacksaddle grouper
Lutjanidae	<i>Aprion virensis</i>	Green jobfish
	<i>Lutjanus bohar</i>	Twinspot snapper
	<i>Macolor macularis</i>	Midnight snapper
Carcharhinidae	<i>Carcharhinus melanopterus</i>	Blacktip reef shark
	<i>Carcharhinus amblyrhynchos</i>	Grey reef shark
Hemigaleidae	<i>Triaenodon obesus</i>	Whitetip reef shark
Mobulidae	<i>Manta birostris</i>	Manta ray

Table 2. Species counted in ‘Large indicator fish abundance 30 minute swim’ surveys

Table 3 below lists the number of 30 minute large fish abundance counts that were completed for each island

30 minute large fish survey	
Island	# of surveys
Birnie	2
Enderbury	2
McKean	1
Nikumamoro	2
Orona	1
total	8

Table 3. 30 minute large fish counts completed for each island

Coral Health Rapid Assessment

Coral descriptive work was completed at all dive sites both snorkel and scuba. At each dive site, visual estimates of the percentage of the live coral cover were made and recorded. Notes were taken of any sightings of recent coral bleaching, coral disease, crown of thorns starfish *Acanthaster planci* present, and crown of thorns starfish damage. At each site a set of

'landscape' digital photographs was taken at typical locations in a depth zone representative of the typical reef flat for that site. Also a coral transect method used adapted from a standard method (Obura 2006b, Obura pers. com, Rotjan pers. com)

The number of coral health transects completed for each island is listed in table 4 below.

Coral health transects	
Island	# of surveys
Canton	6
Birnie	2
Enderbury	2
Orona	1
McKean	1
Nikumamoro	2
Atafu, Tokelau	2
total	16

Table 4. number of coral transects completed at each island

One temperature recorder previously placed by the NEAQ team at a permanent monitoring site at Nikumamoro was retrieved and will be returned for analysis.

Analysis of data and reporting

There will be a report completed by V. Kerr summarizing observations from the data collected. All data and photography is currently being forwarded to Randi Rotjan of New England Aquarium who will undertake detailed analysis of the coral health photographs. It is not known at this point what form of report will be submitted from the NEAQ work.

Marine data and all photographic material collected on the survey can be accessed from Vince Kerr. Email vincek@igrin.co.nz