PHOENIX ISLANDS PROTECTED AREA

KIRIBATI

Draft Management Plan
2010 – 2014

Foreword

Kiribati is an ocean nation. We have ocean-faring tradition going back 1000s of years traversing the shared history of Micronesia and Polynesia peoples in the central and South Pacific. The sea and islands are our blood.

In this new millennium in which humanity has reached the limits of the planet we share and our activities are changing the very climate that nurtured us, we recognize the shared future that all people on the planet face. With this in mind, we have established the Phoenix Islands Protected Area affectionately known as the " PIPA" with two goals in our mind and hearts.. One is as a real commitment to living sustainably in our environment, to learn and show how nature and people can function harmoniously where distance and isolation are both the challenge and the saving grace. Second is as a symbol for how the world's people must come together to sustain our common future; this is our gift to humanity, from a country that is humble by number of people and size of economy, but rich in ocean heritage. PIPA is what we can give to a shared future with others, that says 'this is what we believe in', 'this is a belief we would like to share with other peoples of the world'.

The Phoenix Islands, lying in the heart of the Pacific Ocean, contain 8 out of our 33 islands Kiribati and constitute 11.34% of Kiribati's Exclusive Economic Zone (EEZ). PIPA was born through the hard work and shared vision of many people and institutions, both from within Kiribati and internationally. In a few short years it has gone from just an idea to the largest marine protected area in the world. The most important foundation for this has been that while the islands have supported different people over their history, their small size and isolation, even by Pacific standards, have meant they have not been able to support permanent human settlements. And because of this isolation, the islands and seas around them have retained a pristine condition that few other islands have been able to. Recognizing that this was not only significant to Kiribati but to the world, my government has founded PIPA in partnership with New England Aquarium (NEAq) and Conservation International. .Together we have put together the expertise and the framework to protect and sustain these islands in a way that benefits our economy and people that live on populated islands and the partnerships is growing with governments and agencies fron around the world supporting the PIPA.

This Management Plan is the core expression of that expertise and commitment. Compiled over two years of hard work and consultations, it condenses all the elements that are necessary to maintain PIPA as a pristine set of islands in the middle of a vast ocean. From laws to staffing to enforcement to monitoring to financing, it summarizes all the elements needed to manage and maintain the Phoenix Islands. Backed up by an endowed Trust, that raises investment funds to maintain PIPA values intact, and laws enacted in Kiribati Parliament, this Management Plan shows how we are committed to keeping our part of the planet intact, for the betterment of the Kiribati people and the world..

This Management Plan is the expression of the Kiribati' peoples' commitment to take care of our planet for the good of mankind. We welcome your support.

President Anote Tong
Republic of Kiribati

Executive Summary

The Phoenix Islands lie in the heart of the Pacific Ocean and are one of the most remote island chains on Earth. They are located approximately halfway between Fiji and Hawaii. The largest atoll, Kanton, is 1,750 km (1,087 miles) from the Kiribati capital Tarawa. The eight islands are uninhabited except for Kanton Atoll that houses a small caretaker population.
Due to its remoteness and isolation, the Phoenix Islands could be the last atolls on earth with unique values still unspoiled, including pristine coral reefs,, abundance of fish and other marine wildlife including globally important seabird populations. This prompted the Kiribati government to declare it the Phoenix Islands Protected Area (PIPA) in 2006 which became the largest marine protected area with a total area of 408,250 sq.km (157,626 sq.miles) with the adoption of the PIPA Regulations 2008. With the PIPA Trust Conservation Act 2009 enacted Kiribati and its partners aim to ensure the sustainable financing needed for the conservation and management of PIPA.

The PIPA Management Plan is divided into 4 main chapters: (1) the description of PIPA;
(2) PIPA human uses, threats, issues and challenges; (3) PIPA vision and management objectives and ;
(4)PIPA strategic action plan 2010 – 2014.

Chapters 1 to 3 provides the background information on PIPA including its location in the world map, boundaries, current uses by the government, potential world heritage values or PIPA properties, threats and challenges and some others. In other words, the first three chapters form the basis for the formulation of the PIPA strategic action plan.

Chapter 4 is considered the heart of the plan. It contains the PIPA strategic plan for the next four years (2010 – 2014). The plan provides the framework, actions and targets to implement PIPA's Management Objectives through the implementation of this Plan. The three key components of the strategic action plan (SAP) include: – PIPA Core Management; PIPA "Issues to Results" and the State of PIPA report 2014.

The PIPA Core Management (SAP 1) provides for the requisite decision making, administration, management, resourcing and operation of the PIPA. These activities are regarded as essential for the basic maintenance of the PIPA to allow meeting obligations under the relevant statute(s).
In addition to the core management requirements, a number of key prioritized issues for PIPA requiring targeted action are identified for this management plan (SAP 2). These include: - PIPA atoll & reef restoration and biosecurity; coral reefs and coastal management; endangered and threatened species; offshore fisheries; cultural and historical heritage; seamounts and deep sea conservation; and addressing climate change issues in PIPA c. For each 'issues to results', a summary end desired target state is identified for this Plan (SAP 2.1 – SAP 2.7), the baseline status of the issue summarised as at January 2010, and a series of actions outlined.

As required under the PIPA Regulations 2008 and from the outcome of the various actions strategic implemented, the State of PIPA Report 2014 will be produced (SAP 3). This report will be used as a basis for evaluation of the effectiveness of PIPA management to date, issues arising and will provide input to the next PIPA Management Plan to be effective from 1 January 2015.

PIPA Management Plan Process

The first PIPA management plan was completed and approved by the then Phoenix Island Steering Committee (PISC) in December 2007. The plan was the outcome of the consultations made with key stakeholders government ministries and other stakeholders including Non Government Organisations (NGOs).

With the adoption of the PIPA Regulations 2008, which significantly expanded the area to be conserved and formally constituted a multi government agency PIPA Management Committee together with clear goals of management the Management Plan, a revision of the 2007 plan was agreed. This updated plan was also formulated to be consistent with World Heritage Convention requirements for protected areas listed as natural sites. Kiribati submitted PIPA for World Heritage listing in January 2009.

With the adoption of the PIPA Regulations in February 2008, the PISC was renamed the PIPA Management Committee (PIPA-MC). The PIPA Management committee comprises representatives of:

- MELAD (the Principal Environment Officer, the Environment and Conservation Division, PIPA Office),
- Ministry representatives from Fisheries, the Phoenix Islands, Finance, Tourism, Foreign Affairs, Commerce,
- The Office of the Attorney General
- Kiribati Police Service
- Atoll Research Centre of the University of the South Pacific

The PIPA Management Plan 2010 - 2014 is the outcome of the PIPA Management Committee's meetings, workshops and consultations with the PIPA overseas partners and other stakeholders. This 5 year plan will be reviewed late in 2014 and learning and issues arising will be incorporated into an updated Plan from 2015.

List of acronyms

BEN	South Equatorial Current
BES	South equatorial branch of the South Equatorial Current
CBD	Convention on Biological Diversity
CEPF	Critical Ecosystem Partnership Fund
CI	Conservation International
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Conference of Parties
CRISP	Coral Reef InitiativeS in the Pacific
DSL	Deep Scattering Layer
DWFN	Distant Water Fishing Nation
ECD	Environment and Conservation Division (MELAD)
EEZ	Exclusive Economic Zone
EIC	Equatorial Intermediate Current
EN	Endangered IUCN Red List category
ENSO	El Niño-Southern Oscillation
FAD	Fish Aggregating Device
FFA	Forum Fisheries Agency
FSP	Foundation of the Peoples of South Pacific
GBRMPA	Great Barrier Reef Marine Park Authority
GCF	Global Conservation Fund of Conservation International
GEIC	Gilbert Ellice Island Colony
GEF	Global Environment Facility
GLISPA	Global Island Partnership
GoK	Government of Kiribati
IAS	Invasive alien species
IBA	Important Bird Area of Birdlife International
IFAW	International Fund for Animal Welfare
IUCN	International Union for the Conservation of Nature
KANGO	Kiribati Association of Non-Governmental Organisations
KBA	Key Biodiversity Area of Conservation International
MDG	Millennium Development Goals
MELAD	Ministry of Environment, Lands & Agricultural Development
MFMRD	Ministry of Fisheries, Marine Resource and Development
MIC	Micronesians in Island Conservation
MLPID	Ministry of Line and Phoenix Islands
MOU	Memorandum of Understanding
MPA	Marine Protected Area
NBSAP	National Biodiversity Strategy and Action Plan
NDS	National Development Strategy
NEAq	New England Aquarium
NGO	Non Government Organisation
NOAA	National Oceanic and Atmospheric Administration
NSCC	North Subsurface Countercurrent
NZ	New Zealand
NZ-DOC	New Zealand Department of Conservation
NZODA	New Zealand Overseas Development Agency

PA	Protected Area
PAS	Pacific Alliance for Sustainability
PCB	Polychlorinated Biphenyl
PIF	Project Identification Form
PII	Pacific Invasives Initiative
PIPA	Phoenix Islands Protected Area
PIPA-MC	Phoenix Islands Protected Area Management Committee
PISC	Phoenix Islands Steering Committee
POP	Persistent Organic Pollutants
RNHP	Regional Natural Heritage Programme of Australia
SAMTEC	The Space and Missile Test Center
SECC	South Subsurface Countercurrent
SOPAC	Secretariat of the Pacific Islands Applied Geoscience Commission
SPC	Secretariat of the Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
UK	United Kingdom
UNEP	United Nations Environment Programme
UNESCO	United Nations Education, Scientific and Cultural Organisation
UNFCC	United Nations Framework on Climate Change
USA	United States of America
USAF	United States Air Force
USP	University of the South Pacific
TBAP	Tuna and Billfish Assessment Programme
TIGHAR	The International Group for Historic Aircraft Recovery
UNDP	United Nations Development Programme
USFMT	US Fisheries Multilateral Treaty
VMS	Vessel Monitoring System
VU	Vulnerable IUCN Red List Category
WCO	Wildlife Conservation Ordinance
WCU	Wildlife Conservation Unit
WHC	World Heritage Convention
WSSD	World Summit on Sustainable Development
WWII	World War II
WWF	World Wide Fund For Nature
nm	nautical mile

CONTENTS

- **SAP 2.7 PIPA Climate Change**

SAP 3. State of PIPA Report 2014

List of Tables

List of Figures

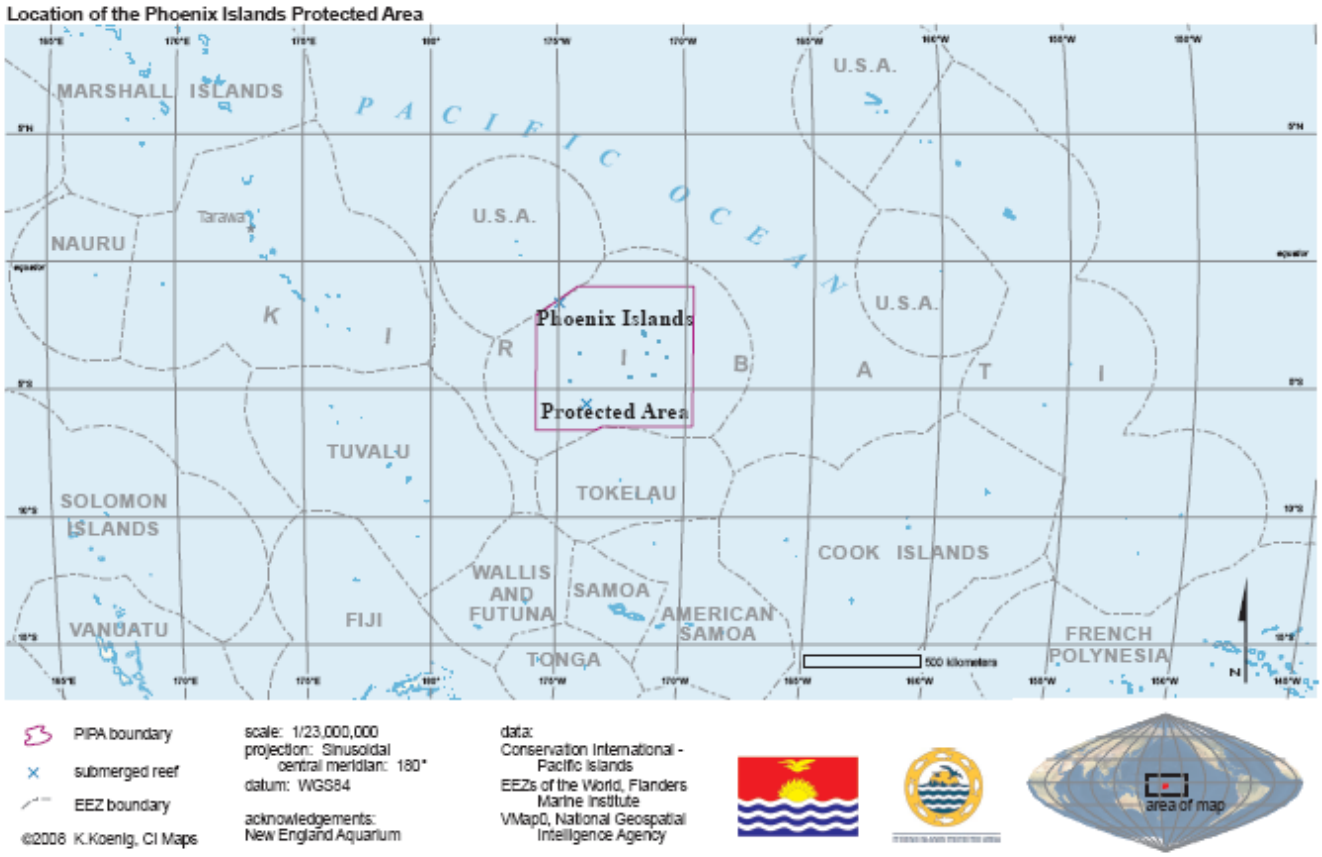
APPENDIX

CHAPTER 1. THE PHOENIX ISLANDS PROTECTED AREA (PIPA)

1.1 The Phoenix Islands Protected Area (PIPA)

The Phoenix Islands Protected Area (PIPA) is centered on a group of islands, the Phoenix Islands, in the geographic center of the Republic of Kiribati in the Central Pacific Ocean (Figure 1). These islands are also known as the Rawaki Islands (Government of Kiribati, 1979).

Figure 1. The Phoenix Islands, Kiribati, Central Pacific.



The Phoenix Island group is situated between the Gilbert Islands to the west and the Line Islands to the east, extending across the centre of Kiribati. Two of the Phoenix Islands, Howland and Baker, are low reef islands in the adjacent territory of the United States to the north of Kiribati.

PIPA's boundaries consists of a heptangular (7 corner points) shaped area that encompass about 408,250 sq km including 8 atoll/reef islands, two submerged reefs and at least 14 identified seamounts and their surrounding mainly deep water marine area. PIPA constitutes 11.34% of Kiribati's Exclusive Economic Zone (EEZ) and is the largest Marine Protected Area (MPA) in the world, first declared by the Government of Kiribati in 2006 and extended in February 2008.

The islands within the boundary of PIPA are (see Figure 2): Kanton (Abariringa /Canton) Birnie, Enderbury, Manra (Sydney), McKean, Nikumaroro (Gardner), Orona (Hull), and Rawaki (Phoenix). Two submerged reefs, Winslow and Caroundelet, and at least 14 known seamounts together with open ocean and deep sea habitat are an integral part of PIPA (Figure 3). These atolls and low reef islands are surrounded by some of the most pristine coral reefs in the world. The waters are teeming with fish in quantities rarely seen elsewhere and tens of thousands of seabirds find refuge on the atolls.

Figure 2. Phoenix Islands Protected Area Boundary Map

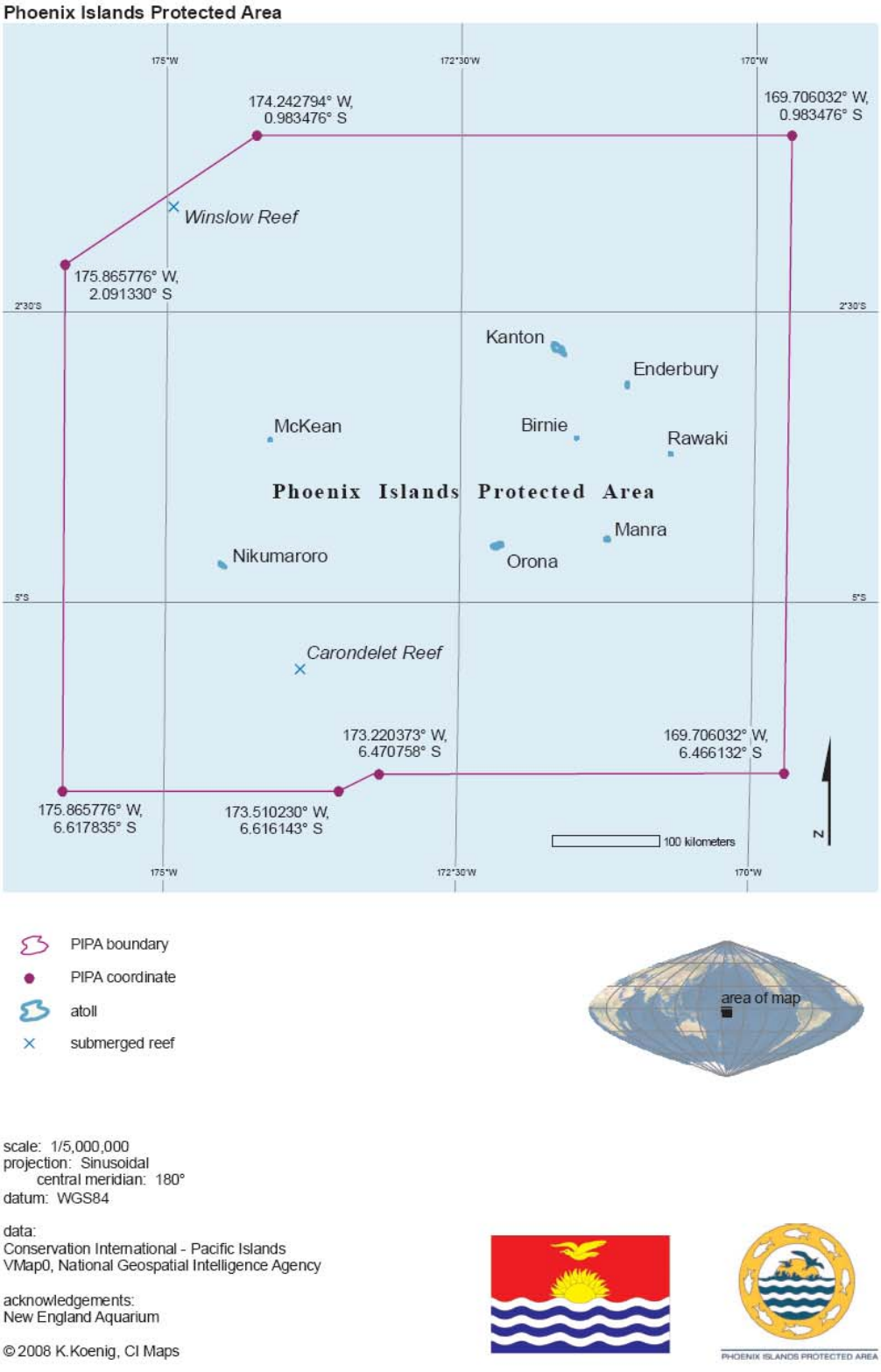
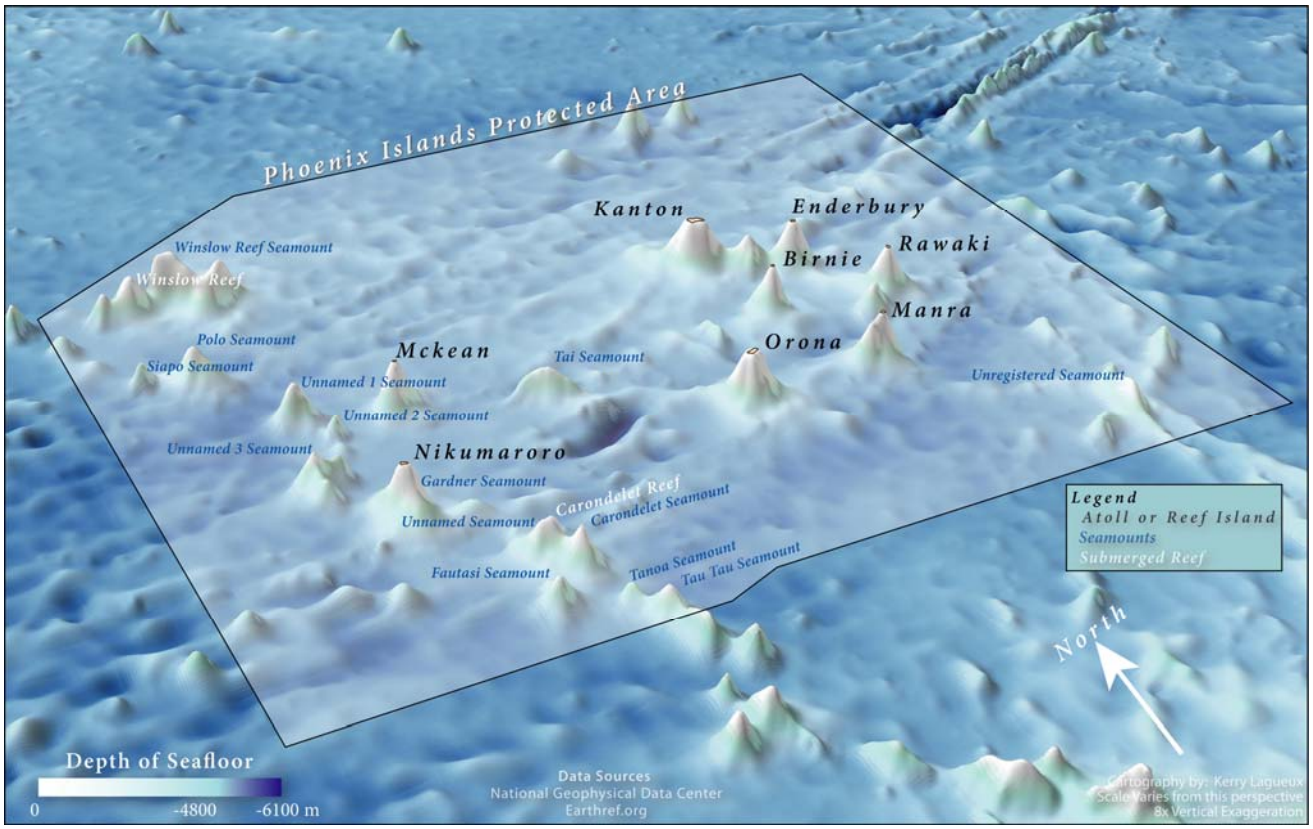


Figure 3. Phoenix Islands Protected Area in 3D



The 8 atolls and low reef islands and the two submerged reefs of PIPA represent only the highest of numerous large and long-extinct volcanoes. An even larger number of large volcanoes do not reach to within 200 metres of the surface and are therefore technically classified as seamounts. Several of PIPA's seamount volcanoes have been studied bathymetrically and formally named and entered into the Seamount Catalogue, including the Carondelet and Winslow seamounts (near their namesake submerged reefs), the Fautasi, Siapo, Polo, Tai, Tanoa, Tau Tau, Gardner. There reamin four unnamed seamounts.

Meteorology

PIPA is located in the Pacific equatorial dry zone that experiences droughts and periods of heavy rainfall. During El Niño periods the Phoenix Islands may experience high rainfall. However, overall the rainfall in the Phoenix Islands is among the lowest in the Central Pacific. Most of the Phoenix Islands receive less than 1,000 millimetres (mm) of rain annually with a dry period from March through June. The northern most islands in the Phoenix are the driest, i.e. Kanton and Enderbury. Birnie, Rawaki, Nikumaroro and McKean are wetter. Orona and Manra are the wettest.

Air temperature ranges from 21.7° to 36.7°C with an average 28.9°C. Relative humidity ranges from 57 to 85 percent.

The Phoenix Islands lie between the Intertropical Convergence Zone and the South Pacific Convergence Zone. The former remains relatively stationary during the year over the central Pacific Ocean; however, the South Pacific convergence zone moves north from January to July.

Between 5^{o}N to 5^{o}S particularly in the central Pacific Ocean (where the Phoenix Islands are located), there is persistent high pressure preventing the development of tropical cyclones (hurricanes).

The meteorological conditions have a significant influence on pelagic fish stocks in the region, including stocks in the Phoenix Islands. During El Niño - Southern Oscillation (ENSO) events this warm water pool shifts to the east and skipjack tuna populations also shift to the east extending to the Phoenix Islands. The Phoenix Islands region appears to be the centre of El Niño activities in the Pacific so may be ideal for studying the El Niño phenomenon and more generally in relation to climate change.

Geology

There has been little study of geology of the atolls and seamounts in PIPA but based on what is known from Howland and Baker, the US islands within the Phoenix Group, some extrapolations can be made for the origins and geological history of PIPA. The Line and Tokelau (PIPA is located across the Tokelau ridge) ridges lie within the Darwin Rise, on a magnetically "quiet" seafloor formed during the Cretaceous Normal Superchron (120–83 Ma). The seafloor underlying the northern part of the Tokelau ridge is dated between 120.4 and 131.9 Ma (Early Cretaceous).

Atoll and reef island development began when the volcanic foundations were still emergent islands in the Cretaceous to Eocene periods, followed by subsidence being offset by upward reef growth maintaining proximity to the sea surface over long time periods. Darwin has been reported to have used some of the Phoenix Islands as a basis for development of his theory of coral reef and atoll development.

Several bathymetric surveys have been completed in the Phoenix Islands. Seabed surface composition was primarily calcareous ooze, siliceous-calcareous clay, and brown clay. The substrate of the Phoenix Islands is almost entirely limestone with accumulated organic matter.

The Phoenix Islands reflect a geological sequence of globally significant mid-oceanic archipelagos, capturing a diversity of forms and developmental stages of ancient atolls, low reef islands, submerged reefs and seamounts, recording in their rock strata the formation of the world's largest biogenic structures (atolls and reef islands) over the past 10 to 80 million years. These formations collectively contain one of the world's most ancient and largest pristine atoll archipelagos, which in turn contribute essential habitat for coral communities, benthic algae communities, giant clam beds, intact atoll forests and intact atoll dry scrubs.

Bathymetry and Seamounts

PIPA has a huge bathymetric range with waters reaching to maximum of 6,147 meters depth but the main seafloor averages around 4,500 metres below the ocean surface. Additional to the ancient volcanoes that reach or approach the surface, bathymetry reveals a series of topographic features which are interpreted to also be volcanoes which technically qualify as 'seamounts' – 'submerged mountains with a height of more than 1,000 metres above the sea floor but whose peak lies below the photic zone'.

Oceanography

Sea surface temperatures within PIPA are normally between 28-30°C. There is no significant thermocline down to 50 m depth. Sea level observations on Kanton show regular four-day oscillations related to equatorial waves. Oceanographic studies reveal that silicate and phosphate levels in the waters around the Phoenix Islands are elevated compared to adjacent waters. This may be a result of upwelling and have high importance for the pelagic food chain in the region.

The Phoenix Islands are adjacent to the equator and are predominantly influenced by the westward-flowing Equatorial Current (northern equatorial branch of the South Equatorial Current (BEN) and south equatorial branch of the South Equatorial Current (BES) (TBAP 1993). Offshore currents are generally westward. The strength of the currents varies with the wind. Usual current speed is 1.9 km per hour (1 knot), with a maximum of 3.7 km per hour (2 knots).

The Phoenix Islands are subject to the ENSO that occurs every two to seven years and lasts for 18 to 24 months. During ENSO events, the westward trade winds are reduced and the main water currents experience variations and even reversal. This deepens the eastern Pacific thermocline. More specifically, the Phoenix Islands are located within the region of the Central Pacific in which a warm pool of surface water develops at the onset of El Niño phases, and can experience persistent hotspots lasting 1 year or more, as occurred in 2002-3. This unique environment of high exposure to warm water pools may exert unusual selective pressures on marine organisms relevant to climate change adaptation, discussed further in later sections.

The Phoenix Islands are also in an area of unique subsurface water currents. This may have great significance for dispersing larvae originating from the Phoenix Islands.

Human Occupation

The Phoenix group islands have no permanent inhabitants, although most islands have a recent cultural history extending over the past 150 years. The one currently inhabited atoll, Kanton, has a non-permanent population of approximately 50 people comprising government employees and their families engaged in protection and management of Kiribati interests in the region.

1.2 PIPA Area Description

PIPA is the world's first large, truly deep water, mid-ocean marine protected area. Whilst the greater part by area of PIPA comprises mainly ocean floor with a water column averaging more than 4,000 metres, an important feature of the marine environment is the abundance of large extinct underwater volcanoes. These underwater mountains contribute to a huge diversity of marine habitat types - atoll, low reef island, submerged reef, seamount and deep seabed as well as open ocean habitats. It can also be described as an underwater 'mountain-scape' with the highest peaks of the volcanic mountains, some rising more than 5,000 metres above the adjacent seabed, the highest reaching almost to the surface forming atolls, reef islands and, just below the surface, shallow submerged reefs.

Total marine area: c. 408, 224.49 km2
Total land area: c. 25.51 km^2
Total designated area: **408,250 km^2**

Table 1. PIPA Island Areas & Geographic Coordinates

Island & Geographic Coordinates	Total area (ha)	Land area (ha)
Manra: 4˚26.2'S to 4˚28.0'S; 171˚13.6'W to 171˚15.9'W	-	c.500
Rawaki: 3˚43.0'S to 3˚43.6'S 170˚42.5'W to 170˚43.0'W	73.24	58.14
Enderbury: 3˚6.3'S to 3˚8.9'S; 171˚4.7'W to 171˚5.7'W	596.6	500+
Birnie: 3˚34.8'S to 3˚35.4'S; 171˚30.7W to 171˚31.2'W	50.95	48.2
Kanton: 2˚46.2'S to 2˚52.2'S;	-	c.900

171˚37.4'W to 171˚43.4'W		
McKean: 3˚35.5'S to 3˚36.1'S; 174˚7.2'W to 174˚7.6'W	74.32	48.77
Orona: 4˚29.0'S to 4˚32.3'S; 172˚8.1'W to 172˚13.1'W	-	c.600
Nikumaroro: 4˚39.2'S to 4˚41.8'S; 174˚29.8'W to 174˚32.8'W	-	c.400

(From Pierce et al 2006)

Because the islands are small with large reef flat areas, they tend to change size depending on the weather and time, hence the approximate sizes. Areas of islands are still not formally surveyed and most recent hand-held GPS surveys by Ray Pierce et al in 2008 suggest smaller than above calculations in the table, i.e. Rawaki was calculated in 2008 to be 66 ha and McKean 32 ha incl. lagoons, the latter of which were 15.3 and 11.2 ha respectively. Birnie is probably also smaller than all the previous calculations suggest.

1.3 Legislative Authority and Purpose

PIPA is established under the Phoenix Islands Protected Area Regulations 2008 (Appendix 3), which were duly promulgated pursuant to sections 43(1) and 86(1) of the Environment Act (1999) as amended by the Environment (Amendment) Act 2007. PIPA is established with a total area 408,250 sq km (Figure 2), inclusive of all island and marine habitats therein.

The Phoenix Islands Protected Area is the Government of Kiribati's (GoK) conservation and sustainable use strategy for the Phoenix Islands and surrounding marine environment. The PIPA Management Plan is developed in accordance with its proposed World Heritage Listing and to further Kiribati's obligations to the World Heritage Convention. PIPA is managed as a Wilderness Area (International Union for the Conservation of Nature (IUCN) Category 1b).

Interim PIPA Management Measures have been agreed to by the PIPA Management Committee since PIPA was first declared in 2006. The PIPA Regulations 2008 require that "pending adoption of this [PIPA] management plan, no activity that takes place in or affects the PIPA or places at risk the ecological integrity of the PIPA shall be licensed, approved or undertaken by any public authority without the express written authorisation of the Minister." Section 6(5) of the PIPA Regulations 2008. Distant Water Fishing Nation (DWFN) tuna fishing fleets operating under valid licenses and agreements are not subject to the PIPA Regulation 2008 or the PIPA management plan with respect to their fishing activities, unless specifically decided otherwise by the Cabinet. Section 11 of the PIPA Regulation 2008.

1.4 Status of PIPA's Natural and Heritage Values

The marine environment of the PIPA is extremely diverse. It varies from the spectacular turquoise lagoons with huge coral heads and clams to pristine and colourful coral reefs that form and surround the atoll, low reef islands and submerged reefs down the slopes of the massive volcanoes to the ocean floor to over 6,000 meters deep. The marine environment of the PIPA is known to support a number of globally endangered and endemic species and hosts interesting and unique species assemblages not found elsewhere in the world.

From a marine science perspective the PIPA is extremely important because of the minimal human impacts and hence its nearly pristine state. In addition PIPA is uniquely situated biogeographically in

the centre of the equatorial Pacific. PIPA is believed to play a significant role in movements and dispersal of marine animals and larvae. Little is still known about the full effect of these islands on the surrounding pelagic marine species and systems, which in turn support internationally important seabird populations and numerous migratory birds.

A full description of habitats, species and ecosystems within PIPA is given in the PIPA World heritage Nomination Dossier (Government of Kiribati, 2009). In summary terms the condition of the PIPA's natural values, the following is provided.

(1) Pristine coral reefs with natural populations of higher predators (sharks, large fish) – Coral reefs are near- pristine. In the early 2000s, legal and illegal shark fishing occurred in many of the Phoenix Islands. After the PIPA declaration in 2006, all shark fishing has been terminated. In 2006, one illegal shark fishing vessel was identified and caught. There is no inshore fishery in the Phoenix Islands since the termination of the Kakai scheme in the early 2000s, except for some subsistence fishing by the government caretakers and their families on Kanton (maximum 50 inhabitants). Coral reefs were impacted by bleaching events in 2002 and 2004. These bleaching events did not appear to impact fish populations or diversity. Since human impacts are basically nil in the Phoenix Islands, coral recovery appeared to be much quicker than in more stressed environments that are heavily influenced by anthropogenic factors.

(2) Highest regional diversity of corals and fishes – Corals and fishes species are highly diverse. Coral reefs were impacted by bleaching events in 2002 and 2004, but are recovering.

(3) Endemic species of corals and fish – Endemic species of corals and fish exist in the Phoenix Islands.

(4) Spectacular lagoon coral and giant clam communities (Kanton and Orona) – Lagoon corals were impacted by bleaching events in 2002 and 2004, but are recovering. Spectacular lagoon giant clam communities exist.

(5) Important marine turtle nesting beaches (Enderbury and Kanton) and breeding/feeding sites – The Phoenix Islands is an important nesting area for marine turtles. It has been speculated that the recently noted decline in sea turtle populations may be attributable to the illegal shark fishing operations in the early 2000s. With the 2006 capture of an illegal shark fishing vessel, the termination of all inshore commercial fishing projects, and the declaration of PIPA, sea turtle populations should recover.

(6) Significant coconut crab populations on Nikumaroro – Coconut crabs exist on several of the Phoenix Islands, but are most abundant on Nikumaroro. In the past, coconut crabs have been harvested, but with the declaration of PIPA, harvest has been banned. This has resulted in coconut crab populations once again flourishing on Nikumaroro.

(7) Traditional Kiribati medicinal plants now rare in the Gilbert Islands, still exist in the Phoenix Islands – There are several species of plants that are used for traditional Kiribati medicines. With population increases, land clearing, and urbanization of the Gilbert Islands, especially Tarawa, these plants are quickly disappearing. Several of these plants still exist in the Phoenix Islands. As such, PIPA can serve as the genetic depository for these important traditional medicinal plants.

(8) Tuna spawning ground reported for skipjack tuna.

(9) Important seabird colonies especially for greater/lesser frigate birds, terns, boobies, tropicbirds and petrels, including the threatened Phoenix petrel and white-throated storm-petrel. Rawaki has the greatest seabird diversity, but McKean and Enderbury are also very important and populations on these and the other islands will recover after pest removal. An initial assessment of harmful exotic species was completed in 2006 (see Pierce et al 2006). Plans have been approved for a phased approach to the removal of harmful exotic species in the Phoenix Islands. As harmful exotic species are removed and biosecurity strengthened, seabird colonies should recover. In addition, on Abariringa, harmful Persistant Organic Pollutants (POPs) were removed in 2006 which should also be beneficial to sea bird populations there especially in conjunction with pest removal. The islands are also important as non-breeding and transient areas for migratory shorebirds.

(10) Population of Phoenix petrel (Endangered) and white-throated storm-petrel (Vulnerable) on Rawaki and potentially on Enderbury and McKean, and all islands are important non-breeding habitat for the bristle-thighed curlew (Vulnerable).

(11) High isolation in the Central Pacific makes these islands unique and critical stepping-stone habitats for migratory, pelagic and planktonic species – There are no islands in close proximity to the Phoenix Islands. The oceanographic conditions are unique and the area is rich in plankton. This was the foundation for the sperm whale populations that were hunted in the early 1800s. It is also the foundation for economically important pelagic tuna fishery. At the same time, this isolation means that species in the PIPA are particularly vulnerable to overharvesting and that recovery of depressed populations will not likely benefit from in-migration of larvae and adults from elsewhere.

(12) The Phoenix Islands include a large number of unexplored seamounts that form part of the Tokelau seamount chain which undoubtedly support unique marine communities – Seamounts are known to have a high level of endemism and often contain high percentages of species that are new to science. Seamount ecosystems are of very special interest for conservation. Several seamounts have been identified in the Phoenix Islands area. However, they have yet to be explored.

(13) Unique cultural history reflecting ancient Polynesian and Micronesian exploration and settlement of the Pacific, 19th century whaling, guano discovery and extraction, aviation history, resettlement, role in WWII, the cold war, and space exploration – The history of the Phoenix Islands extremely diverse and spans centuries (see Chapter 2).

1.5 PIPA's Global Significance

PIPA is the world's first large, truly deep water, mid-ocean marine protected area. As a vast expanse of largely pristine mid-ocean environment, replete with a suite of largely intact uninhabited atolls, truly an oceanic wilderness, the PIPA, the largest marine protected area in the world (408,250 sq km), is globally exceptional and as such is a superlative natural phenomenon of global importance.

A feature of the marine environment of PIPA is an outstanding collection of large submerged volcanoes, presumed extinct, rising direct from the extensive deep seafloor with an average depth of more than 4,500

metres and a maximum depth of over 6,000 metres. Included in the collection of large volcanoes are no less than 14 recognised seamounts, submerged mountains that don't penetrate to the surface. The collection of atolls represents coral reef cappings on 8 other volcanic mountains that approach the surface.

These underwater mountains contribute a huge diversity of marine habitat types - atoll, low reef island, submerged reef, seamount and deep seabed as well as open ocean habitats. It can also be described as an underwater 'mountain-scape' with the highest peaks of the volcanic mountains, some rising more than 5,000 metres above the adjacent seabed, the highest reaching almost to the surface forming atolls, reef islands and, just below the surface, shallow submerged reefs.

The large bathymetric range of the submerged seamount landscape provides depth defined habitat types fully representative of the mid oceanic biota. The widely recognized local endemicity and distinctive species assemblages associated with seamounts generally, specifically demonstrable in PIPA, is evidence of on-going *in situ* evolution of marine ecosystems and communities of plants and animals.

PIPA is of crucial scientific importance in identifying and monitoring the processes of sea level change, assessing growth rates and age of reefs and reef builders (both geologically and historically), and evaluating absolute and relative effects from climate change. The reef systems are so remote and exhibit such near pristine conditions that PIPA can serve as a benchmark for understanding and potentially restoring other degraded hard coral ecosystems in Kiribati and elsewhere in the Pacific. The islands are acknowledged as critical sites for ongoing study of global climate change and sea-level events in that they are located in a region less affected by other anthropogenic stresses. Because of the relative absence of anthropogenic influences these oceanic Central Pacific islands are also unique natural laboratories for understanding the growth of reefs, the evolutionary process of reef systems, biological behavioural studies, recruitment processes in isolation, size classes and population dynamics of marine organism groups and reef species diversity studies.

As a known breeding site for numerous nomadic, migratory and pelagic marine and terrestrial species, PIPA makes a significant contribution to the understanding of on-going ecological and biological processes in the evolution and development of global marine ecosystems and communities of plants and animals.

Due to its great isolation, PIPA occupies a unique position in the biogeography of the Pacific as a critical stepping stone habitat for migratory and pelagic/planktonic species and for ocean currents in the region. PIPA embraces a range of associated marine environments that display high levels of marine abundance as well as the full spectrum of age and size cohorts, increasingly rare in the tropics, and especially in the case of apex predator fish, sea turtles, sea birds, corals, giant clams, and coconut crabs, most which have been depleted elsewhere. The overall marine trophic dynamics for these island communities across this archipelago are better functioning (relatively intact) compared with other island systems where human habitation and exploitation has significantly altered the environment.

PIPA provides important natural habitats for in-situ conservation of globally important oceanic biological diversity, both marine and terrestrial. It is the most important secure habitat of the local endemic and now endangered Phoenix petrel and serves as crucial breeding and resting area for a number of migratory birds. PIPA collectively provides very important habitat for the continued existence of a number of globally endangered species (e.g. Napoleon wrasse, hawksbill turtle), vulnerable species (e.g. white-throated storm petrel, bristle-thighed curlew, green turtle, giant clam, bumbhead parrotfish) and numerous others globally depleted species, both marine and terrestrial, including for example apex predators such as

sharks. It also provides opportunities for biota to recolonise other central Pacific habitat as it becomes restored.
The remoteness of the area and absence of permanent human settlement provides a unique opportunity for a high standard of habitat protection for species and ecosystems of global importance to science and conservation, from atoll to deep sea.

1.6 Relevance to Kiribati Commitments under International Treaties and Conventions.

The PIPA represents an unprecedented commitment by a Small Island Developing State to meet many of its international commitments under the conventions listed below. Protecting the PIPA ecosystems and species from anthropogenic damage while managing them for sustainability provides an opportunity to show how conservation and sustainable development are mutually supportive and may be carried out in other places. Information on ecosystems, species and economic sustainability from PIPA, reported through these conventions, can be used as benchmarks for other countries in measuring and targeting commitments under the conventions.

World Heritage Convention (WHC). Kiribati became a party to the WHC in December 2000. PIPA was submitted to the WHC for listing ad a natural site in January 2009.

Convention on Biological Diversity (CBD). Kiribati became party to the CBD in August 1994. The three objectives of the CBD, to conserve biodiversity, sustainable use, and ensure equitable access to its use are core principles of PIPA.

Ramsar Convention on Wetlands. The shallow coral reefs, lagoons and brackish wetland systems in the Phoenix Islands fall under the convention description of wetlands, and could be listed as a site under Ramsar.

United Nations Framework Convention on Climate Change (UNFCCC). Kiribati ratified the UNFCCC in February 1995, and is one of the most vulnerable of all countries to climate change impacts, as a result of sea level rise and impacts to freshwater and groundwater resources. As a Climate Change Research Laboratory, PIPA can help Kiribati understand climate change impacts to atolls, and research in PIPA can be of global significance/

World Summit on Sustainable Development (WSSD). Kiribati was party to drawing up the Millennium Development Goals (MDGs) under the WSSD. PIPA may help Kiribati in meeting the MDGs, particularly MDG 8, on environment and sustainability.

1.7 Summary of PIPA Management Planning

Phoenix Islands Management pre-2005

The only previous management plan for the Phoenix Islands was prepared by Garnett in 1983. It focused mainly on terrestrial resources and was never effectively implemented. Birnie, Kanton, Enderbury and Orona were identified as “prohibited areas” under the Prohibited Areas Ordinance 1957 (Cap 77), which had the effect of prohibiting entry but did not require or contemplate active management measures. Portions of Kanton were also declared protected under the Closed Districts Act 1990, although the principal objective of this declaration was to allow the orderly development of the atoll. Finally, Rawaki, Birnie and McKean were declared as wildlife sanctuaries under the Wildlife Conservation Ordinance (WCO) (Cap 100??). This statute protected wildlife from human interference but did not protect wildlife habitats. Various specified bird species and the green turtle were protected

under this statute on many of the Phoenix Islands, although again active management was not an element of the program.

PIPA Management 2005-2007

In August 2005, the GoK and partners New England Aquarium (NEAq) and Conservation International (CI) agreed a Memorandum of Understanding (MOU) to design and establish PIPA. This was based on results of two scientific expeditions and extensive consultations amongst the partners. GoK formally declared the PIPA in March 2006. Apart from DWFN activities, from 2006 until February 2008, all activities in PIPA were overseen and decided upon by the Phoenix Islands Steering Committee (PISC). While the focus of this Committee's effort was on the design and full establishment of PIPA, numerous management decisions and protective measures were also instigated during this time including:

- 2005 assessment of coral reef bleaching recovery and associated reef and atoll monitoring
- 2006 assessment of status of protected bird species
- 2006 assessment of impact of invasive species and feasibility of priority eradications, and
- 2006 prosecution of illegal shark finning

PIPA Management 2008- 2009

PIPA was legally created by the Phoenix Islands Protected Area Regulations 2008, which were promulgated pursuant to the terms of the Environment Act 1999, as amended by the Environment (Amendment) Act 2007. Management of PIPA is governed by the terms of the PIPA Regulation 2008 and the provisions of Division 2 of the Environment Act 1999, as amended, that prescribe management requirements for all protected areas created under the act.

Pursuant to the terms of the Environment Act 1999(as amended 2007) and the PIPA Regulation 2008, PIPA is administered by the Minister of the Ministry of Environment, Lands and Agriculture Development (MELAD),. Direct management of the PIPA is under the responsibility of the Secretary of MELAD, who serves as the Principal Environment Officer under the Environment Act 1999 (as amended2007). Acting pursuant this Act and the PIPA Regulations 2008, the Minister of MELAD has constituted a PIPA Management Committee (PIPA-MC), comprised of representatives of all government agencies and other specified non-government entities with a responsibility for the Phoenix Islands (Appendix 3,). The PIPA-MC is chaired by the Secretary of MELAD and it meets regularly with meeting decisions and follow-up implementation documented and reported by the Director of the PIPA Office.

The PIPA Regulations 2008 specify that the PIPA-MC is responsible, among other duties and tasks, for development of the PIPA management plan within twelve months of the regulations coming into force.. This Management Plan is being developed in fulfilment of that obligation.

While this Management Plan has been under development, the PIPA-MC agreed and successfully implemented, with various partners, a range of interim management actions which implement PIPA Regulations (2008) and are aimed at increasing protection of PIPA. These include:

- Invasive Species Eradication Mission (New Zealand Overseas Development Agency (NZODA), New Zealand Department of Conservation (NZ-DOC), MELAD, Pacific Invasive Initiative (PII), and Pacific Expeditions) in 2008 (Pierce et al 2008)
- Visitor Permit system and associated Rules,and Fees
- Research Permit System and associated Rules and Fees
- Tourism Operator Permit system and associated Rules and Fees
- Completion of PIPA Resource Valuation, Endowment Strategy and Trust Fund legislation,

- PIPA World Heritage Nomination
- A range of enforcement and surveillance activities including successful prosecution of illegal vessel and response to a potentially serious vessel grounding on Kanton Atoll.

The PIPA Management Committee has developed and finalised this Management Plan with support from the PIPA Office and partners CI, NEAq and expertise provided by the Governments of Australia and New Zealand.

CHAPTER 2 HUMAN USES OF PIPA – ISSUES AND CHALLENGES

2.1 History, Development and Cultural Values

The Phoenix Islands were inhabited by Polynesian settlers between approximately AD 950 to 1500. They left stone building foundations that resembled marae from eastern Polynesia. In addition to building foundations, ancient stone weirs and fish traps were also discovered on some of the Phoenix Islands. It was speculated that the Phoenix Islands were abandoned because of droughts. Evidence was also found that suggested the Phoenix Islands were visited by Caroline Islanders (Micronesians). Most archaeological structures were found on Orona and Manra.

Western discovery of the Phoenix Islands began in earnest with the expansion of the American whale fleet into the Pacific in the early 1800s and focused on sperm whales. Many of the Phoenix Islands were 'discovered' by American or British whalers. It was not until the U.S. Exploring Expedition of 1838 to 1842, that the exact position of many of the Phoenix Islands was determined.

In the mid 1800s guano became an important agricultural commodity worldwide. The 1856 U.S. Guano Act allowed American citizens to claim previously unclaimed and uninhabited islands for guano extraction. Most of the Phoenix Islands were claimed and registered under this act. Guano was extracted from many of the Phoenix Islands. After major deposits had been depleted, effort focused on transforming the Phoenix Islands into coconut plantations. Coconut trees were planted, but many died due to drought conditions. Title to the Phoenix Islands was transferred between various companies in the early 1900s. With the Kingsford-Smith pioneering trans-Pacific flights in 1928 and 1934, the USA and UK began competing for a mid-Pacific refueling stop. Amelia Earhart was lost at sea in 1937 and may have landed on Nikumaroro. Later that year, a solar eclipse centered in the Phoenix Islands was studied by teams from the USA and NZ. In 1938, UK began resettlement of Manra, Nikumaroro, and Orona with people from the Gilbert Islands which were considered over-populated. In 1939, Kanton and Enderbury were placed under the joint administration of the UK and USA. This allowed for construction of airport facilities on Kanton that same year.

The outbreak of WWII resulted in isolation for the settlements in the Phoenix Islands. Kanton became a center of military activities, with the U.S. military development of three air strips, and one seaplane landing area within the lagoon. Kanton was a critical link to ferrying military equipment from the USA to NZ and Australia during WWII. Kanton was bombed by the Japanese on three occasions.

After WWII, Kanton airport facilities were turned over to U.S. civilian control. Up to four different airline companies used this facility until the late 1950s, when jet aircraft began flying non-stop between Hawaii and Fiji. Droughts hit the Phoenix Islands causing abandonment of the Manra colony in the mid-1950s. Inhabitants of Orona and Nikumaroro were resettled in the Solomon Islands in the early 1960s and the United States of America Airforce (USAF) set up a space vehicle tracking station on Kanton. This was later converted to a satellite tracking station, then to a Space And Missile Test Center (SAMTEC). SAMTEC closed in 1976 and in 1979 a Treaty of Friendship was signed between the USA and GoK in which the USA gave up its claims to Kanton and Enderbury.

After Kiribati independence in 1979, GoK declared a 200 nautical mile Exclusive Economic Zone (EEZ) around the Phoenix Islands. Various schemes were attempted to resettle the Phoenix Islands including the Kakai scheme on Orona in 2001. Key economic activities such as copra, bech-de-mer, and sharkfin harvest were undertaken. However, the scheme was not successful nor sustainable and was closed in 2004. In the 2000s, NEAq began periodic visits to the Phoenix Islands to document conditions on these islands. An outcome of the NEAq studies was the 2006 GoK declaration of PIPA.

Today,in 2009, 31 people live on Kanton as caretakers on behalf of the GoK, which also serves as a port of entry for Kiribati.

In summary, a number of identified cultural and historical values that PIPA has include:

- Archaeological evidence, including walled structures, is evidence of early colonization by both Micronesians and Polynesians, providing an important cultural link and an example of island voyaging over time and the limits to which human settlement can extend – even into modern times. The Phoenix Islands could be considered an overlap area of these two important Pacific Islands peoples.
- The island Nikumaroro was named by Gilbertese settlers in 1937 in honour of the island of Nikumaroro, in the south of the Gilbert Group, from which the famous Gilbertese ancestress Nei Manganibuka came, bringing with her the traditional lore of deep-sea navigation and the first *buka* tree.
- Nikumaroro is possibly the site of the crash landing of Amelia Earhardt on her failed trans-Pacific flight in 1937. Remains of a well-documented World War II crash also exist on the island of Manra.
- Several islands in the group hold archaeological remains of settlements, guano mining and whaling/transiting ships from the 19th and early 20th centuries.
- Archaeological remains of the 20th century world include British and United States military bases from the Second World War, the airfield markers and base for the Trans-Pacific Pan-Am Clipper seaplane flights of the mid 1940-50s, and the United States missile testing base SAMTEC.

2.2 Fisheries Development

Offshore Fisheries

Interest in offshore fisheries resources (tuna) around the Phoenix Islands began after WWII, stimulated by Hawaiian fishing interests. Fisheries research indicated that juvenile skipjack were available in the Phoenix Islands, indicating that this area was a skipjack spawning area. In the 1980s tuna tagging studies were initiated. Results indicated that these species migrate large distances during their lifetimes, including ranging through the waters of the Phoenix Islands.

The offshore fisheries (tuna) were active prior to Kiribati independence in 1979. GoK control over its waters was established in 1979 when the 200 nautical mile EEZ was declared. In 1987, the USA and certain Pacific Island states entered into a Multilateral Treaty on Fisheries. This allowed US purse seiners to operate in Kiribati waters (including the Phoenix Islands). Effort (days fishing) and landings data for longline, pole and line, and purse seine vessels for vessels fishing in the Kiribati EEZ (including the Phoenix Islands) has been published for each of the DWFN fleets. Data indicate that periodically during certain years the Kiribati EEZ around the Phoenix Islands is a significant source of tuna. Apparently during periods of El Niño, sea surface temperatures increase in the Phoenix Islands along with skipjack landings.

There is increasing concern on the sustainability of tuna fisheries in the Pacific Islands region. The Government of Kiribati, as party to the Nauru Agreement, has instituted measures to restrict effort in Kiribati waters, e.g., restrictions on the use of fish aggregation devices and purse seine exclusion zones. These measures apply to PIPA, contributing to PIPA's role as an MPA used to conserve tuna. There is evidence of tuna spawning grounds in PIPA and further research is needed to better understand the significance of these spawning grounds. Kiribati has also agreed to a 'reverse fishing license' concept whereby compensation will be paid to the government for lost DFWN revenues in return for increased conservation and protection of pelagic resources, submerged reefs, and sea

mounts in the PIPA, achieved through expanded DWFN area closures. This concept has been agreed to be phased in. The PIPA Management Plan proposes to use a zonation approach whereby certain areas are delineated within the PIPA boundary and will be specified with respect to permissible and prohibited uses or activities. The current or baseline zonation of PIPA with respect to full "no-take" areas amounts to 3.87% of the total PIPA marine area (Figure 4). During the next phases of implementing the PIPA Management Plan, Kiribati intends to zone an additional 25% of the MPA as a no-take zone as a measure to conserve tuna stocks.

Although there are no domestic commercial offshore fisheries currently operating in PIPA, any future development of domestic commercial fishing licenses will be conditioned to reflect the government's decision to prevent further commercial exploitation of these resources.

Inshore Fisheries

The inshore fisheries on the Phoenix Islands have been limited by virtue of the isolation of the islands and their limited human populations. After WWII and prior to the collapse of commercial airline connection on Kanton in the late 1950s, there were up to three fishing companies exporting fish to Hawaii. They made use of the commercial airline connections through Kanton. Most recent fishing has been for subsistence needs only for the local Kanton community. In the early 2000s, shark fishing by a DWFN vessel on several Phoenix Islands and by Kakai scheme participants on Orona resulted in the massive depletion of sharks on several Phoenix Islands. There was speculation that these shark fishing efforts may have also reduced turtle populations there.

Surveys led by NEAq have determined that coral reefs and inshore fisheries are extremely robust and constitute spectacular examples of these globally important habitats and species. In this Plan's Phase 1 or Baseline Zonation, seven of the atolls are designated as full "no take" zones out to 12 nautical miles around each reef system (Figure 4). On Kanton subsistence fishing is permitted to meet the needs of the local caretaker population. Although there are no domestic commercial inshore fisheries currently operating in PIPA, and future development of domestic commercial inshore fishing licenses will be conditioned to reflect the government's decision to prevent further commercial exploitation of these resources.

2.3 Existing Uses

At this time, all of the Phoenix Islands are uninhabited except for Kanton. There are GoK employees on Kanton in a caretaker capacity with a total population is about 30.

The Phoenix Islands are periodically visited by ocean going yachts and by special boat charters for recreational divers and various researchers and ecologists. Immigration clearance is by the customs officer on Kanton. In addition, inter-island boats that service Tarawa and Kiritimati periodically re-supply the residents of Kanton and the GoK patrol vessel visits the Phoenix Islands at least annually.

As noted above, wildlife sanctuaries, closed areas, and prohibited areas have been previously established on a number of the PIPA islands, including Rawaki (Phoenix), McKean, and Birnie.

The Phoenix Islands Protected Area was declared in 2006, subsequently enlarged and legally gazetted by the GoK in early 2008. PIPA is the 'current use' of the Phoenix Islands and embodies Kiribati's conservation and sustainable resource use aspirations of this component of its territory. The PIPA Regulations 2008 provide the full mandate for Kiribati to manage all uses and interests across all sectors for these islands.

2.4 PIPA Management Issues and Challenges

Detailed descriptions and documentation on environmental issues related to the Phoenix Islands are provided in Uwate and Teroroko (2007a) and in the PIPA World Heritage Convention (WHC) Nomination dossier (2009). Environmental issues and challenges include the following.

- Conservation of Natural Heritage and Biodiversity - The Phoenix Islands was identified as a key biodiversity area within the Polynesia/Micronesia Biodiversity Hotspot Program under CI's Critical Ecosystem Partnership Fund (CEPF) (Atherton, 2008). This designation reflects the diversity, abundance and in some cases threatened species status of seabirds found in these islands. Coral reef and associated biota have now been well documented and contain populations of globally important and threatened species and are superb examples of intact coral reef ecosystems. Maintenance, and in some cases restoration, of biodiversity values are a key challenge for PIPA's management.

- Recovery of Endangered and Threatened Species – Endangered species listings that relate to the Phoenix Islands include (1) the IUCN Red List of Threatened Species that lists endangered species is for Kiribati, and (2) the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) appendices for Kiribati. These lists are updated regularly by Environment and Conservation Division of MELAD (ECD) nationally, and the lists for the Phoenix Islands are integrated into these. The Red List and CITES lists for Kiribati are provided in the Appendices. Of particular interest is sperm whales. In the early 19th century the American whaling fleet flourished in the Pacific and many thousands of sperm whales were taken from Phoenix Islands waters. During more recent expeditions to the Phoenix Islands no sperm whales have been observed

- Atoll restoration, Biosecurity and Invasive Species Management – A number of species have been accidentally or deliberately introduced to the Phoenix Islands, some having caused significant environmental damage to the local flora and fauna. A significant ongoing challenge and investment for PIPA is in the eradications of invasive alien species and prevention of any new introductions. Feasibility studies and prioritizations have been carried out for invasive species management in PIPA and the first two highest priority eradications (the rabbit, *Oryctolagus cuniculus*, from Rawaki, and the Asian rat, *Rattus tanezumi*, from McKean) were carried out in 2008, but their long term success has yet to be confirmed. Priority actions for additional restoration in the Phoenix Islands (see Pierce et al 2006) include:
  - Eradicate the Pacific rat, *Rattus exulans*, from Birnie.
  - Eradicate the Pacific rat, *Rattus exulans*, from Enderbury.
  - Eradicate cats (and rodents if present) on Orona.
  - Complete biosecurity planning and ensure ongoing implementation.

- Illegal and Overfishing - Inshore fisheries of the Phoenix Islands are vulnerable to over fishing. In the early 2000s, a shark fishing vessel operated in several of the Phoenix Islands. After one illegal visit by one vessel, shark populations were fished in one atoll to near-zero levels. It was speculated that this one vessel also reduced turtle populations in the islands visited. Currently seven of the eight atoll/reef islands are no take zones and a sustainable resource use plan will be developed for the remaining atoll, Kanton. Surveillance and enforcement of these inshore areas together with offshore fishing is a significant ongoing challenge for PIPA.

- Illegal and Overfishing – Off shore fisheries of the Phoenix Islands are focused on tuna. GoK is party to a range of fisheries agreements but has limited capacity for surveillance, enforcement and management. Despite this the recent agreements under the 3rd Arrangement to the Nauru Agreement has important fisheries management decisions including a 3 month ban on Fish Aggregating Devices (FADs) and a mandatory 100% observer coverage. The Nauru Agreement is a fisheries agreement between eight Pacific Islands states, including Kiribati, that aims to empower their role in tuna fisheries in their EEZs The recent signing of the Shipriders Agreement between USA and Kiribati also provides an additional mechanism for fisheries management. Under this agreement Kiribati's Officers can travel on the USA surveillance vessels and have full powers of investigation and arrest in Kiribati waters. Surveillance and enforcement of offshore fishing by DWFN, both legal and illegal, remains a significant challenge not only for PIPA but for GoK's entire EEZ.

- Climate Change, Coral Bleaching, Sea Level Rise and Ocean Acidification - In July to September 2002, there was a sea temperature hot-spot in the Phoenix Islands which caused mass bleaching and mortality of corals, most notably in the lagoon of Kanton and leeward reefs of Kanton and Nikumaroro. Long term monitoring pre and post bleaching indicates rapid recovery of PIPA's coral reefs, likely due to the fact that there are no other stressors present eg over fishing, pollution etc. All PIPA's atolls and reef islands are low lying and vulnerable to sea level rise. Terrestrial vegetation and seabird populations are vulnerable to salinization of groundwater due to sea level rise and inundation. There is also concern at the impacts of increasing ocean acidification on coral reefs and other species in PIPA. Due to the absence of other anthropogenic stressors PIPA has a potentially important role to play in researching and understanding impacts of coral bleaching, climate change and resilience of tropical reef systems.

- Cultural Heritage - archeological investigations have confirmed that Polynesians and Micronesians variously used the Phoenix Islands. However all attempts at settlement appear to have been unsuccessful in the long term likely due to limited freshwater resources and frequent droughts. Conservation of marae, fishing structures and sites from more recent human history with PIPA are planned. PIPA exemplifies the limit of pacific peoples' migrations and attempted colonization.

- Ocean Dumping - An explosives dumping area was established southwestward of Kanton at the end of WWII. Coordinates for the dumping area were $3^0$09'S to $3^0$28'S, and $171^0$53'W and $172^0$13'W. Other areas of Kiribati eg Tarawa have been cleared of military waste due to the threat it poses to local fisherman in particular.

- Toxic Wastes – Various toxic materials were left by the US military on Kanton after WWII. Some of these materials leaked from their containers and had spilled onto the concrete floor. Asbestos strips were common at former military sites on Kanton. Polychlorinated Biphenyls (PCB's) were found in transformers and probably were also present in switches and other electronic equipment. Toxic wastes were inventoried in 2002. Most were removed in 2006 under a Secretariat of the Pacific Regional Environment Programme (SPREP)/ Kiribati/ Australian programme.

- Unregulated Visitors – Visitors to the Phoenix Islands largely arrive by recreational yachts or increasingly through tourist charters. Some may anchor and stay on one of

the Phoenix Islands for extended periods. Some probably do not clear Customs and Immigration on Kanton first and others from fishing boats and freighters have been known to land. There are environmental concerns with unregulated visitors. These include: disposal of sewage and wastes, illegal collection and harvest of terrestrial and marine resources, potential introduction of Invasive Alien Species (IAS) and disturbance of bird populations. The arrival of IAS on any of the islands could be disastrous and significantly undermine the restoration goals for the PIIPA.

- Vessel Groundings, potential Oil Spills and IAS arrival - The Phoenix Islands have had numerous vessel groundings over the years. One of the earliest recorded groundings was the whaleship *Canton* on Abariringa (Kanton) in 1854. Undoubtedly, there have been other groundings that were not permanent, did not result in vessel loss, or were not reported. Ships caused coral damage during grounding and break-up. More recently (c.2001) a Korean trawler grounded on McKean Island and is believed to have been the source of the introduction of Asian rats (Pierce et al 2008). It is now also becoming clear that rusting shipwrecks add iron to the water around them, and since iron is severely limiting in the Central Pacific, this results in significant shift of reef ecology to dominance by turf algae, and death of corals (Stone et al. 2009).

- Tourism –the declaration and publicity surrounding PIPA interest in tourism, particularly dive tourism, is increasing. Tourism is seen as a potential source of sustainable income for GoK and PIPA. A strategy to develop tourism in a safe, sensible and sustainable manner is a key action area within this management plan.

- Deep Sea - a significant component of PIPA is deep sea and open ocean habitat. Little is known about the submerged reefs or 14 or more seamounts within PIPA's boundaries. Research into these areas is planned as resources and opportunities allow.

- Transboundary Issues – the range of several species present in the Phoenix Islands extend beyond the limited of the Phoenix Islands. Many species of birds, fish, and turtles migrate to and from the Phoenix Islands. In order to protect these migrating species, habitat and conditions in other parts of a species range need to be considered.

- Overall Management, Surveillance Enforcement, Human Capacity and Resources - there remains limited capacity and resources within Kiribati to provide effective management for PIPA. Isolation can no longer be relied upon to protect the values of PIPA. This is a key action area under development and resourcing in this plan and is reflected in the partnerships GoK has fostered to implement the PIPA.

Critical cross cutting issues related to the above primary issues and challenges list are:

- Lack of information (data gaps) – resource surveys on birds, plants, insects, mammals, corals, and fish of the Phoenix Islands have increased in the last decade. Nevertheless, for many species and systems on the islands, information available may be several decades old. No resource surveys have been reported for either Winslow or Carondelet reefs, nor on the unnamed reef just northwest of Carondelet. Major data gaps are noted for turtles, reptiles, marine mammals, coconut crabs, and deepwater habitat and associated species.

- Lack of accessibility to available information – During this planning effort, perhaps 90 percent of the research reports found relating to the Phoenix Islands were not previously available in Kiribati. In many cases, despite local research permit requirements, no report was submitted to GoK, or the report was misplaced or lost. Without access to documentation on previous activities and research, planning for an activity or research is difficult.

- Non-standardized data collection and analyses – In the resource surveys in the Phoenix Islands survey methodology has varied almost as much as the number of researchers. Results from using different survey methodologies are difficult, if not impossible, to compare. In some cases, the methodology is not quantitative and resultant data cannot be compared. Survey results need to be quantifiable and comparable.

- Limited local, global, and visitor awareness – The Kiribati people are not completely familiar with the all the attributes of the PIPA and need to be educated and kept informed about the special features of the Phoenix Islands, and about progress in managing this resource. Local support for PIPA in Kiribati is essential for its success. In addition, the awareness of the global community needs to be improved regarding PIPA and its many unique features. Many know of the declaration of PIPA, but many more need to be made aware of the unique resources and features of the Phoenix Islands. Visitors to the Phoenix Islands need to be informed about PIPA. They can also be enlisted to assist in monitoring activities on the islands.

- Limited surveillance and enforcement of existing wildlife sanctuaries - Over the last several decades, there has been basically no surveillance and enforcement of the declared wildlife sanctuaries on some of the Phoenix Islands – their sheer isolation has been their saving grace. This situation needs to be addressed in the formulation of PIPA. Some activities can quickly reduce pristine populations to almost zero, as in the case of recent shark finning activities and the recent harvests of coconut crabs on Nikumaroro. Without surveillance and enforcement, the resources of the Phoenix Islands can quickly be exploited to the point of stock collapse.

- Limited biosecurity measures at the source areas (especially Tarawa, Kiritimati) for vessels travelling to and through the PIPA.

- Sustainable economic development – There are limited economic opportunities in Kiribati. With the development of PIPA, opportunities for tourism and fisheries development and employment may develop. Opportunities may include ecotourism and catch and release fishing by visiting tourists. Other potential opportunities for revenue generation for GoK need to be investigated. GoK also wishes to keep the option of ocean mining operations open. Any development activities should be sustainable and executed in an environmentally friendly manner consistent with the PIPA Regulations 2008.

Critical issues that relate to support for management and logistics include:

- Transportation limitations – There are several major problems that will be encountered by anyone planning to use Kanton. These include the isolation and consequent lack of regular transportation to and from the island. During the Kakai Scheme, the costs of servicing the island were too high to justify the volume of cargo shipped. The

diversion of an inter-island vessel was over AUD $5,000 per trip. For any visit to the Phoenix Islands, transport costs can be very high.

- High operating costs of activity in the Phoenix Islands – There are extremely limited resources available on the Phoenix Islands. All supplies and construction materials, food and equipment must be imported. This makes establishing and operating any facility on the Phoenix Islands extremely expensive.

- Remoteness of each Phoenix Island relative to others – There are eight Phoenix Islands. Some of these islands are more than 200 nautical miles (nm) away from their neighbours. This distance cannot be covered safely in a small vessel with an outboard motor. It is costly and difficult to visit all of the islands of the Phoenix Group, even if based on Kanton. A sea-worthy vessel with at least 500 nm range would be required. Also, adequate fuel supplies for refuelling the vessel would be needed on Kanton.

- Costly communication - Communication is limited to radio and satellite phone. Internet is available to marine vessels so a similar system could be installed on the Phoenix Islands.

- Lack of safe anchorage and landing facilities – For most of the Phoenix Islands, except Kanton, landing facilities are non-existent. Changing weather and currents coupled with the limited size of suitable anchorage areas makes safe anchoring very difficult. During the guano period in the late 1800s, special permanent anchors and cables had to be set up for guano ships. Consideration is needed regarding permanent anchoring stations so that vessels can anchor safely and the fragile coral reef habitat is preserved.

- Developing effective biosecurity for the Phoenix Islands.

- Lack of potable water – There is limited freshwater in the Phoenix Islands. Some of the islands do have freshwater, but not enough to support large populations. Major considerations are needed for all activities involving placement of people on the Phoenix Islands, whether this is for short term (such as for research surveys) or long term (for management purposes).

.

CHAPTER 3. PIPA MANAGEMENT PLAN 2010 – 2014:

VISION, GUIDING PRINCIPLES, MANAGEMENT OBJECTIVES & STRATEGIC ACTION PLAN SUMMARY

3.1 PIPA's Vision:

"to conserve the natural and cultural heritage of the Phoenix Islands Protected Area for the sustained benefit of the peoples of the Republic of Kiribati and the world."

3.2 PIPA's Mission

"to implement effective integrated and adaptive management that ensures the natural and cultural heritage values of PIPA are maintained, and where necessary restored, to achieve PIPA's Vision"

3.3 Guiding Principles

The Management of PIPA will be carried in accordance with the PIPA Regulations (2008) and in consistent manner with the agreed PIPA Vision and Mission using the following guiding principles (drawn from DOALOS 2007):

- "Intergenerational equity - Future generations are entitled to inherit marine resources and biodiversity in a state that is as good as, or better than, their current state".
- "Ecological sustainability - Ecological sustainability is the foundation of both social and economic development. Key elements of management and planning for ecological sustainability include ecosystem-based management, conservation of ecological processes, protection of critical habitats, use not to exceed maximum sustainable yield or carrying capacity, conservation of biodiversity in general and conservation of rare and endangered species in particular".
- "The precautionary principle - The absence of scientific certainty should not be a reason for postponing management of protected areas. If an activity is assessed as having a low risk of causing serious or irreversible damage or if there is insufficient information with which to assess fully and with certainty the magnitude and nature of impacts, decision making should proceed in a conservative and cautious manner".
- "Integrated planning and management - Many of the activities that can potentially threaten Protected Areas (PAs) occur outside their borders, including terrestrial areas, and often come under the jurisdiction of other management agencies. Management of PAs should consider all potential sources of threats and develop a management protocol that addresses these threats. In order to achieve this, management of the PA will need to be integrated with management responsibilities of the other relevant agencies".
- Adaptive management – PA management needs to be viewed as an adaptive process or experiment that is varied in response to changes in the character and intensity of threats, increased knowledge, and changes in the composition of the local community. Adaptive management requires the establishment of performance measures at the outset of management. The results of systematic monitoring of key indicators are evaluated against the agreed performance measures, and management adjusted (if necessary) to ensure that objectives and goals are being achieved".

- Ecosystem Approach - A strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way (IUCN 2006). The application of the ecosystem approach will help to reach a balance of the three objectives of the CBD: conservation; sustainable use; and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources.
- Resilience – "The ability to absorb or recover from disturbance and change, while maintaining ecosystem functions and services. Resilience relates to the concepts such as representation, replication, refugia, connectivity, and management".
- "Stakeholder consultation and participation – protected areas are used by a range of stakeholders, many of whom derive their livelihoods from the PA and have no alternative sources of livelihood. They are likely to be affected by management of the PA and have the right to be consulted and to play an active part in the decision-making process. Many stakeholders also possess much knowledge and experience that can assist in planning and management'.
- "Capacity-building - A key element to the successful implementation of PA management is skilled and knowledgeable staff. Where skills and knowledge are limited, capacity building of staff is a critical element in the success of PAs. Capacity building is required both at headquarters level, focusing on skills for effective management, enforcement, communication and decision-making, and at field levels, focusing on surveillance, monitoring, pest and incident management, communication and education.
- Technology transfer - Considerable technology is available that facilitates decision-making and the evaluation of management actions. A modern and appropriate technology base is a central component of PA management. This includes computing and communication facilities, information resources, and geographic information systems. A sustainable long-term financing strategy is also important for the success of the PA".
- Transparency of decision making – Decisions regarding the management of the protected area need to be made transparent to the public. Information on decision makers, their decisions, and the basis for their decisions should be readily available to the public.

3.4 PIPA Regulations (2008) - Management Objectives

The PIPA Regulations (2008) set the long term management objectives for this PIPA Management Plan:

1. To conserve and manage substantial examples of marine and terrestrial systems to ensure their long-term viability and to maintain genetic diversity;

2. To conserve depleted, threatened, rare or endangered species and populations and, in particular, to preserve habitats considered critical for the survival of such species;

3. To conserve and manage areas of significance to the lifecycles of economically important species such as tuna;

4. To prevent human activities from detrimentally affecting the PIPA;

5. To preserve, protect, and manage historical and cultural sites and natural aesthetic values;

6. To facilitate the interpretation of marine and terrestrial systems for the purposes of conservation, education and tourism;

7. To accommodate within appropriate management regimes a broad spectrum of multi-use human activities compatible with the primary goal of marine and terrestrial conservation and sustainable use, including appropriate fishing, ecologically-sound tourism, and sustainable economic development;

8. To provide for research and training, and for monitoring the environmental effects of human activities, including the direct and indirect effects of development activities; and

9. To ensure consistency between all activities taking place in the PIPA and any third-party conservation contracts into which the Minister may choose to enter with the advice and approval of the Cabinet for the conservation and long-term sustainable use of the PIPA.

3.5 Summary PIPA Strategic Action Plan (SAP) Framework 2010 -2014

To implement the long term PIPA Management Objectives the following Strategic Action Plan (SAP) Framework for 2010-2014 has been developed.

SAP 1. PIPA Core Management:
Decision making, Administration, Core Management and Resourcing

- **SAP 1.1 GoK MELAD Minister and Cabinet**
- **SAP 1.2 PIPA Management Committee**
- **SAP 1.3 PIPA Managerial Operation**
- **SAP 1.4 PIPA Regulations, Licenses and Permits and Penalties**
- **SAP 1.5 PIPA Zonation**
- **SAP 1.6 PIPA Surveillance and Enforcement**
- **SAP1.7 PIPA World Heritage Listing**
- **SAP 1.8 PIPA Partnerships, Transboundary & International Collaboration**
- **SAP 1.9 PIPA Information Management, Education and Outreach**
- **SAP 1.10 PIPA Science and Research**
- **SAP 1.11 PIPA Tourism**
- **SAP 1.12 PIPA Kanton Atoll – Sustainable Resource Plan**
- **SAP 1.13 PIPA Monitoring and Evaluation**
- **SAP 1.14 PIPA Sustainable Financing, Resourcing and Business Planning**
- **SAP 1.15 PIPA Annual Operational Work Plan & Report**

SAP 2. PIPA 'Issues to Results'

- **SAP 2.1 PIPA Atoll& Reef Islands Restoration & Biosecurity**
- **SAP 2.2 PIPA Coral Reefs and Coastal Management**
- **SAP 2.3 PIPA Endangered and Threatened Species**
- **SAP 2.4 PIPA Offshore Fisheries**
- **SAP 2.5 PIPA Cultural and Historical Heritage**
- **SAP 2.6 PIPA Seamount & Deep Sea Conservation**
- **SAP 2.7 PIPA Climate Change**

SAP 3. State of PIPA Report 2014

CHAPTER 4. PIPA STRATEGIC ACTION PLAN FRAMEWORK 2010-2014

The PIPA Strategic Action Plan provides the framework, actions and targets to implement PIPA's Management Objectives through the implementation of this Plan.

STRATEGIC ACTION PLAN 1. PIPA CORE MANAGEMENT

PIPA Core Management provides for the requisite decision making, administration, management, resourcing and operation of the PIPA. These activities are regarded as essential for the basic maintenance of the PIPA to allow meeting obligations under the relevant statute(s). These essential programme elements are summarized here:

- **SAP 1.1 GoK MELAD Minister and Cabinet**
- **SAP 1.2 PIPA Management Committee**
- **SAP 1.3 PIPA Managerial Operation**
- **SAP 1.4 PIPA Regulations, Licenses and Permits and Penalties**
- **SAP 1.5 PIPA Zonation**
- **SAP 1.6 PIPA Surveillance and Enforcement**
- **SAP1.7 PIPA World Heritage Listing**
- **SAP 1.8 PIPA Partnerships, Transboundary & International Collaboration**
- **SAP 1.9 PIPA Information Management, Education and Outreach**
- **SAP 1.10 PIPA Science and Research**
- **SAP 1.11 PIPA Tourism**
- **SAP 1.12 PIPA Kanton Atoll – Sustainable Resource Plan**
- **SAP 1.13 PIPA Monitoring and Evaluation**
- **SAP 1.14 PIPA Sustainable Financing, Resourcing and Business Planning**
- **SAP 1.15 PIPA Annual Operational Work Plan & Report**

SAP1.1 GoK, Cabinet, MELAD Minister and PIPA Regulations (2008)

The Phoenix Islands, inclusive of the 200 nm EEZ and fully inclusive of PIPA, are owned by the Republic of Kiribati.

The initial authority for designating PIPA as a Protected Area was by decision of the GoK Cabinet in early 2006. This authorized the Minister of Environment, Lands and Agricultural Development, the Hon. Martin Puta Tofinga to declare the PIPA at the Biodiversity Convention 8th Conference of the Parties in March 2006 in Brazil.

The PIPA was legally established in early 2008 with the adoption by the GoK Cabinet of the Phoenix Islands Protected Area Regulations 2008, promulgated pursuant to the Environment Act (1999), as amended by the Environment (Amendment) Act 2007. At this time, the Cabinet approved extension of the PIPA area from the originally declared 187,600 sq. km. protected area to 408,250 sq. km. making PIPA the world's largest marine protected area. The PIPA Regulations 2008 are attached in Appendix 2.

PIPA is governed under the authority of the Minister of Environment, Lands and Agriculture Development. MELAD's primary law in this regard is the Environment Act (1999), as amended (2007), and the PIPA Regulation 2008. Specific guidance is provided in the Act's

Division 2 – Protected Areas (Sections 42 to 48) including protected areas that are listed for World Heritage (Section 48). PIPA is established under sections 43(1) and 86(1) of the Act.

The PIPA Regulations 2008 have three key objectives:

(1) to prescribe a protected area for the terrestrial and marine resources of the Phoenix Islands,
(2) to prescribe particular license and permits for regulating certain activities in the PIPA and to establish a schedule of penalties, and
(3) to approve the nomination of PIPA to the World Heritage list."

The PIPA Regulations 2008 came into force in February 14, 2008 and provide the commitment for PIPA to be nominated for World Heritage listing. The GoK submitted the PIPA nomination dossier in January 2009 and the decision of the World Heritage Committee is expected in June 2010.

The MELAD Minister provides regular reports to GoK's Cabinet on PIPA's management, progress and issues arising and has created a PIPA Office within the Ministry to administer various PIPA-related activities and responsibilities.

The PIPA Regulations also give specifications for PIPA's Management Plan consistent with furthering the obligations of the World Heritage Convention. These regulations give protected area status to all 8 atoll/islands, their lagoons and internal waters, adjacent Kiribati territorial sea and the EEZ to the outer boundary specified. PIPA is considered to be Category Ib under IUCN protected areas categories: Wilderness Area: protected area managed mainly for wilderness protection.

The PIPA Regulations specify the following:

(1) Requirements of the PIPA management plan;
(2) The PIPA Management Committee;
(3) General conservation and management measures;
(4) PIPA permit, licence and penalty provisions;
(4) The status of DWFN fishing access agreements; and
(5) Reporting requirements for the state on PIPA.

It is important to note that in the preparation of the PIPA Regulations (2008), a review was done of relevant national legal instruments regarding coastal and marine resource conservation and international commitments to ensure harmonisation and consistency.

Related to the long term strategy for management of the PIPA is the passage into law of the Phoenix Islands Protected Area Conservation Trust Act 2009. This is a separate piece of legislation providing for the establishment and operation of a PIPA Conservation Trust Fund in Kiribati, which is intended to provide sustainable financing for PIPA management costs, trust fund administration and agreed compensation for lost DWFN license revenues for GoK that may be associated with the restriction of PIPA to DWFN activities in the future.

SUMMARY: For this Plan (PIPA Management Plan (2010-2014) the PIPA Regulations will continue to be the primary instruction together with the high level decision making roles embodied in the MELAD Minister and GoK's Cabinet.

SAP 1.2 PIPA Management Committee

The PIPA Management Committee is formally established by the Minister under the PIPA Regulations (2008). This committee was previously recognized as the PISC (PIPA Steering Committee) under the design phase of PIPA.

The PIPA-MC is chaired by the Secretary of the Ministry of Environment, Lands, and Agriculture Development (MELAD). The Management Committee meets regularly, monitoring and managing decisions ensuring these are well documented and reported by the PIPA Director who also acts as secretary to the Committee. The PIPA Management committee comprises representatives of:

- MELAD (the Principal Environment Officer, the Environment and Conservation Division, PIPA Office),
- Ministry representatives from Fisheries, the Phoenix Islands, Finance, Tourism, Foreign Affairs, Commerce,
- The Office of the Attorney General
- Kiribati Police Service
- Atoll Research Centre of the University of the South Pacific

In addition, local NGOs (e.g., Foundation of the People of the South Pacific) participate in an advisory capacity as do international NGO PIPA partners, such as CI and the NEAq.

The PIPA-MC, and its predecessor the PISC, have a successful track record in decision making and recommendations to the MELAD Minister and through to Cabinet as needed and appropriate.

As specified in the PIPA Regulation 2008, the primary responsibilities of the PIPA MC are:

- Preparation of draft PIPA Management Plan,
- Resolving any interagency differences and making recommendations to the Minister relating to actions for PIPA's management,
- Providing advice as required by the Minister, and
- Monitoring PIPA's management and making reports as required by the Minister to ensure compliance.

Further the PIPA MC has a key role to provide support for acquiring resources for implementing the PIPA management plan.

SUMMARY: For this Plan (PIPA Management Plan (2010-2014) the PIPA Management Committee will continue in its primary role as the management and Ministerial advisory body, and government coordinating body for the PIPA and MELAD's Minister.

SAP 1.3 PIPA Managerial Operation

The PIPA Director and the PIPA Office is based at MELAD in Bikenibeau (Tarawa). The PIPA Director is responsible for the day-to-day operation of the PIPA. The PIPA Office has utilized a range of consultants and staff during its first 4 years of operation. In this Plan the PIPA Office will be expanded and additional capacity and resources placed on Kanton Atoll.

. This includes a close working relationship fostered with the MELAD Wildlife Unit and the Agriculture Division on Kiritimati in the Line Islands.

Resources for this expansion are expected from the United Nations Environment Program (UNEP) Global Environment Facility (GEF) Pacific Alliance for Sustainability (PAS) funding and associated co-financing to PIPA for the period 2010-2014. In the next PIPA Management Plan (2015 onwards), the ongoing cost of core PIPA staffing and operation is expected to be covered from the PIPA Trust Fund endowment income. GoK and its NGO partners have agreed a phased approach to management activities and additional restrictions of current DWFN activities in the PIPA so that endowment capital growth will produce adequate income to cover agreed PIPA management costs, trust fund costs and compensation for loss of license revenue from DWFNs.

- PIPA Office – MELAD Tarawa

Core staffing: - PIPA Director, Secretary, Education/Outreach/Communication Officer, PIPA Monitoring Officer, Finance Officer. Other short term staff and/or consultants may be used based on PIPA needs and resources.

Core role: day-to-day operation of PIPA and promotion of its mission and vision in collaboration with the Kanton PIPA office and the MELAD Wildlife Unit and the Agriculture Division on Kiritimati. This position also provides a secretarial role to the PIPA MC.

Infrastructure requirements: the PIPA Office is already established. Additional infrastructure will be limited to equipment for the office eg computers, desks, chairs and resources for its ongoing operation eg internet, phone etc.

- PIPA Office – Kanton Atoll

Core staffing: two PIPA officers and their families (if any).

Core role: Work with the existing roles of the caretaker staff on Kanton but also locally responsible for surveillance and enforcement, biosecurity, visitor education and management, monitoring and Kanton atoll resource utilization.

Infrastructure requirements: housing, office space, surveillance boat, satellite phones etc will be required. Priorities in this Plan will be a boat suitable for surveillance of Kanton Atoll and its surrounds and communication equipment suitable to work with Kiribati Fisheries, Maritime Police and the PIPA office to monitor the wider PIPA area and to work with surveillance and enforcement effort.

It is realized that this vessel alone is insufficient for the surveillance and enforcement requirements of PIPA. Options for a larger boat suitable for PIPA/Phoenix EEZ-wide surveillance and enforcement (and resource monitoring) will be investigated. This will be combined with efficient design, and operation, of remote surveillance capacity through Kiribati's Fisheries programme.

- MELAD Wildlife Unit and the Agricultural Qurantine Section– Kiritimati Atoll

In many respects Kiritimati Atoll is a gateway to the Phoenix Islands. In particular biosecurity measures should be planned and implemented in a complementary way for both

the Phoenix and Line Islands. Resourcing and staffing requirements for an effective collaboration between the Wildlife Unit and PIPA will be investigated and implemented (as required).

- Multi-Agency responsibilities, PIPA-MC

It is recognized that as per the PIPA-MC membership and operation PIPA is a multi- agency undertaking. To be consistent with this arrangement, the MELAD PIPA Office and its Director (under the instruction of the PIPA-MC and with the Minister's endorsement) will contract out specific responsibilities on an annual basis. Contracts will be based on the PIPA-MC endorsed work plan. Agreed services that are required to manage the PIPA effectively include:

Agency	**Roles and responsibilities**
Kiribati Ministry of Fisheries	• Management of fishing effort in allowed zones • Marine resource surveillance and enforcement • Coral reef and marine monitoring
Environment and Conservation Division	• Environmental monitoring and impact assessment • Environmental and other conventions • Terrestrial, birds and invasive species (through Wildlife Conservation Unit (WCU), Kirimati) • Coral reef and marine monitoring
Agriculture	• Biosecurity and IAS issues
Kiribati Maritime Police	• Surveillance and enforcement services
Kiribati Tourism	• Tourism promotion of PIPA, tourism planning and feasibility study • Tour operator/Visitor Management
Office of the Attorney General	• Legal services
Cross-cutting	• International conventions – hosted with the relevant government focal point/Department • Climate Change

Any other agencies and activities not specified above are to be specified by the PIPA-MC and/or Minister.

- Existing government services, Kanton

Existing government services on Kanton will play a role in management, surveillance and enforcement of PIPA regulations. These include a police and customs officer, nurse, school teacher, wireless operator and meteorology officer. Additional budget allocations for Phoenix Islands work include Maritime Police Surveillance by the patrol vessel (including Phoenix Islands EEZ) and shipping service to Kanton en route to and from Kiritimati Atoll.

During 2010 a description and costing will be completed for each of the above services. The source of funding will be specified, including those from PIPA financing and from existing

budget allocations from the national Treasury. Services that are to be contracted under this Management Plan, will be costed and agreed on an annual basis under the auspices of the MELAD Minister. Modalities for financing these costs will be outlined in each annual workplan (e.g. from endowment income, grants, penalties, permits, fines, allocation from other ministries/departments)

SUMMARY: For this Plan (PIPA Management Plan (2010-2014) the PIPA Office will be expanded and resourced, including on Kanton Atoll, and with effective collaboration maintained with MELAD's Wildlife Unit on Kiritimati Atoll (Line Islands). Agreed PIPA Services (e.g., tourism development, surveillance) will be contracted out to relevant agencies within and outside Kiribati under the direction of the PIPA Management Committee and managed by the PIPA Director.

SAP 1.4 PIPA Regulations, Permits, Licenses and Penalties

The PIPA Regulations (2008) provide explicit guidance to licenses, permits and penalties allowable under the PIPA. Importantly PIPA Regulations 6(5) specify "that pending adoption of the management plan no activity that takes place in or affects the PIPA or places at risk the ecological integrity of the PIPA shall be licensed, approved or undertaken by any public authority without the express written authorization of the Minister." The exception to this is the ongoing management of the DWFN licenses as provided for by GoK's Fisheries Ministry consistent with the current Phase 1 Zonation of PIPA.

The PIPA Regulations (2008) also provide for any approvals for permits or licenses issued by the Minister or designated authority shall be consistent with the provisions of the PIPA Management Plan and Regulations. Further the Principal Environment Officer has the primary responsibility and authority to commence civil, criminal, injunctive or other action against any person or corporation reasonably believed to be in violation of the Environment Act, PIPA Regulations and/or the PIPA Management Plan.

The Principal Environment Officer has the responsibility and authority to amend, suspend, revoke or withhold any license or other authorization issues to a person or corporation reasonably believed to be in violation of their terms of license or authorization.

Currently, Licenses and Permits in the PIPA, issued by the Principal Environment Officer, are required for the following activities:

<u>Permits</u>

- Science, cultural, management, or educational studies – submission of research proposal to PIPA Director, discussion and recommendation by PIPA-MC together with any other specific agency requirement. Subject to approval (or not) by the Principal Environment Officer, the PIPA Director has authorization to issue a research permit (see Appendix 7) with an associated requirement of a research permit fee.
- Specimen collection – special permission is required from the Principal Environment Officer and is considered as part of the Research Permit process as outlined above, with final approval from the Principal Environment Officer and payment of specimen collection fee.

- Tourism Operators – A submission of a tourism operator proposal to the PIPA Director is required. This will be followed by discussion and decision by PIPA-MC together with any other specific agency. Subject to the approval (or not) of the Principal Environment Officer, the PIPA Director has authorization to issue a tourism operation permit and collect the associated permit fee. (Appendix 7).
- Visitor/Tourist Permit – if not covered by the Tourism Operator permit, then approval of a visitor permit can be made by the PIPA Director and/or applied for when the visitor reaches Kanton Atoll (see Appendix 7). Furthermore, if bone or catch and release fishing will be conducted in the PIPA, a permit and its associated fee will be required.
- Special Permit – any special permission must be obtained from the Principal Environment Officer prior to the start of any activity. Again a proposal must be submitted. The evaluation of such proposals is under the management of the PIPA Director with input from the PIPA-MC, with final approval given by the Principal Environment Officer.

Licenses

- DWFN Fishing – Kiribati's Fisheries Ministry is responsible for all fishing licenses issued in the PIPA and the Phoenix Islands EEZ. License fees are subject to negotiation between the DWFN and GoK's Fisheries Ministry. All DWFN are conditioned to prevent fishing inside 12 nm of the Phoenix Islands and to prohibit purse seining within 60 nm of Kanton.
- Domestic Commercial Fishing Licenses – all Kiribati vessels larger than 7 meters must be licensed. Kiribati intends to maintain the status quo with respect to the fact that there are no domestic commercial fisheries in PIPA by attaching conditions to annual domestic permits prohibiting commercial fishing in the PIPA. Through the Kanton Island Sustainable Use plan, impacts by subsistence fishing and/or by vessels under the size limit for permits will be maintained within the goals of PIPA.

Additional special conditions may be specified on each issued permit or license at the discretion of the government.

Penalties

A schedule of penalties, consistent with the Environment Act 1999, as amended, and the PIPA Regulations (2008) will be developed by the PIPA Director for the PIPA-MC review and endorsement to the Principal Environment Officer and MELAD Minister for approval no later than 30 June 2010. Fines will not exceed $100,000 AUD and/or terms of imprisonment not to exceed 5 years.

It is important to note that the Environment (Amendment) Act 2007 gives special recognition and protection to listed World Heritage sites (Section 48) with a fine provision of up to $100,000AUD and a maximum of 5 years in prison for an offence relating to a listed Kiribati World Heritage site (Section 28). Should PIPA become WHC listed, then this penalty will be applied.

Reporting

On a six monthly basis the PIPA Director under the approval of the Principal Environment Officer shall provide a summary report on permits issued, any management issues arising or

anticipated, and any recommendation for the Principal Environment Officer and Minister to consider in this regard. License and permit fees will be reviewed on an annual basis.

SUMMARY: For the PIPA Management Plan (2010-2014) the permit and license regime, as outlined above, will continue to operate, be reviewed on a six month basis and management refined and improved accordingly. By June 2010 a Schedule of Penalties and Fees shall be developed and endorsed by the Principal Environment Officer consistent with the Environment Act 1999, as amended and the PIPA Regulations (2008). It is expected that the Penalty and Fee Schedules will be attached to this Plan (Appendix 7) and be implemented upon its approval to all new permits and licenses made post 1 July 2010. Until such time the existing fee regime and PIPA Regulations 2008 (in particular Sections 6(5), 10 and 11) shall continue to apply.

SAP 1.5 PIPA Zonation

The use of zonation is a core tool of PIPA Management, including a phased zonation approach to core protection measures as resources and capacity allow. In this Plan (2010-2014) two phases of PIPA zonation are proposed: the current or Phase 1 Zonation and an increase of 25% in the no take zone coverage once the PIPA Trust Fund income reaches an adequate capitalization level to compensate for any losses in DWFN license fees associated with such limitations.

Four levels of protection are incorporated into the Management Plan:

1. No-Take Zones – total ban of all extractive activities, and strict control of all activities to ensure no impact to marine and terrestrial species or habitats. This is the strictest level of protection and all activities must be explicitly assessed and permitted by PIPA-MC.

2. Restricted Use – sustainable and subsistence use of resources are allowed in this zone, allowing some “take” of specified allowable species, and construction/habitat alteration that has the purpose of enhancing the management and use of PIPA, but is assessed to have non-significant impacts on species and habitats. Currently, this designation applies solely to Kanton Island, and all activities are managed under a Kanton Sustainble Use Plan (SAP 1.12). Marine and Terrestrial. Permits to be assessed and provided by PIPA-MC.

3. Fisheries Exclusion zone – commercial extraction by purse seines is prohibited, but longlines are allowed. Based on Fisheries Regulation, this applies to a belt from 12-60 nm around an atoll. In PIPA, this designation applies solely to Kanton Island. Marine. Permits to be assessed and provided by the Ministry of Fisheries and Resource Development.

4. Ocean buffer zone – The remainder of PIPA excluding zones 1, 2 and 3 above. Fishing activities are allowed under permits as per the current rules and regulations governing fishing in Kiribati. All other activities in the sea or on/under the seafloor must be assessed and permitted by the PIPA-MC. All activities in this zone should be commensurate with the objectives of PIPA.

Current Phase 1 PIPA Zonation

The current PIPA Zonation (Phase 1) is given in Figure 4. The objective of Phase 1 Zonation is to secure the protection of the 8 PIPA islands, lagoons, reefs and nearshore habitats. This series of island-based no take zones amount to just over 15,000 sq km or 3.7% of the PIPA area. Current (Phase 1) PIPA Zonation is summarized below and in Table 2:

a) No-Take Zones around 7 PIPA islands (2.6%, excluding Kanton). All activities in these areas must be non-extractive and all require individual permits obtained from PIPA.
    a. Land area - 3 islands protected by Wildlife Sanctuary Ordinances and by PIPA legislation (Rawaki, McKean,Birnie)
    b. Land area - 4 islands not designated as Sanctuaries, but access is restricted by prior legislation as well as by PIPA regulations (Enderbury, Orona, Nikumaroro, Manra). This includes any freshwater/brackish ponds, such as on Manra, Enderbury.
    c. Marine area – the lagoons of Nikumaroro and Orona
    d. Marine area – a 12 nm territorial zone strip around each island
b) Restricted Use zones at Kanton (0.3%) – with an administrative population of about 30 people, extensive historical use, and good anchorage and airstrip. Designated for multiple use for purposes of PIPA management and sustainable development, and ongoing national presence;
    a. Land area – a sustainable Kanton plan is envisaged, to be developed under SAP 1.2 in which all activities, people and uses are permitted individually.
    b. Marine area – subsistence fishing - the lagoon and 12 nm territorial limits around Kanton designated for subsistence use by people resident on Kanton. Currently 30 people, but will expand with development and visitors. Permitting system required to manage impacts and limit numbers and fishery types. Bone fishing (catch and release) also to be allowed in the lagoon.
c) Fisheries Exclusion zone (9.5%) - Marine area, Kanton from 12 nm to 60 nm, exclusion for purse seiners but longliners allowed. All permits provided by MFMRD. No other fishing permits are to be given. PIPA regulations should mention no others permits to be given without consultation between MFMRD and PIPA-MC.
d) Ocean Buffer zone (87.7%). Buffer zone for the restricted zones of the MPA. No current uses other than those licensed by MFMRD (purse seine, longline, pole and line) and none can be initiated without permitting from MFMRD and PIPA. Future zones to be considered for protection in this zone include:
    a. Submerged reefs – Winslow and Carondelet
    b. Seamounts - Tai, Polo, Siapo, Gardner, Tanoa, Fautasi, Tau Tau and others.
    c. Sea floor
    d. Pelagic zones

Table 2. PIPA Zonation Summary

	Protection level	1) No-Take Zone			2) Restricted Use zone		3) Pelagic Fishery zone	4) Ocean Buffer zone	Total PIPA
	Permitting authority	PIPA			PIPA		Fisheries	PIPA	
	Protection type	Widlife Ord	Land/permit	12nm	multiple use	subsistence	60nm	open	
	Land/Marine	Land	Land	Marine	Land	Marine	Marine	Marine	
Islands	Rawaki	0.58							
	McKean	0.49							
	Birnie	0.48							
	Enderbury		5						
	Orona		6						
	Nikumaroro		4						
	Manra		5						
	Reef/shallow closure (7 PIPA islands, 12 nm)		.	12,714					
Kanton	Kanton (multiple use)				9				
	Kanton susbsitence zone (12 nm around perimeter of 50 km	.				2,486			
	Kanton purse seine exclusion (less Birnie, Enderbury)						37,197		
Ocean	Open ocean buffer zone							355,822	
	Totals	1.6	20	12,714	9	2,486	37,197	355,822	**408,250**
	Total restricted areas (protection types)			12,736		2,495	37,197	355,822	
	% total PIPA area			3.1%		0.6%	9.1%	87.2%	
	Total restricted areas (overall)						*52,428*	355,822	**408,250**
	% total PIPA area						12.8%	87.2%	

Phase 2 PIPA Zonation

Phase 2 PIPA Zonation has the core objective of increasing the no take zone coverage by an additional 25% of the total area of PIPA. Phase 2 Zonation will be implemented once the PIPA Trust fund is capitalized to a level sufficient to compensate GoK for any lost DWFN license fee income associated with the increase in the no take zone coverage. Agreed priorities in the increase of the no-take zone coverage are:

- 12 nautical mile no-take zone around Winslow and Carondelet Reefs.
- Increased no-take zone around 7 of the PIPA islands, excluding Kanton.
- Filling the gap between the two groupings of the PIPA islands with no-take zone.
- Maximizing underrepresented habitat in the no-take zone coverage, particularly seamounts.
- Ensure a more easily navigable and enforceable overall no-take zone boundary.
- Areas outside the above zones will still be allowable for fishing, consisting of DWFN or Kiribati boat access for tuna, as per the current rules and regulations governing fishing in Kiribati.

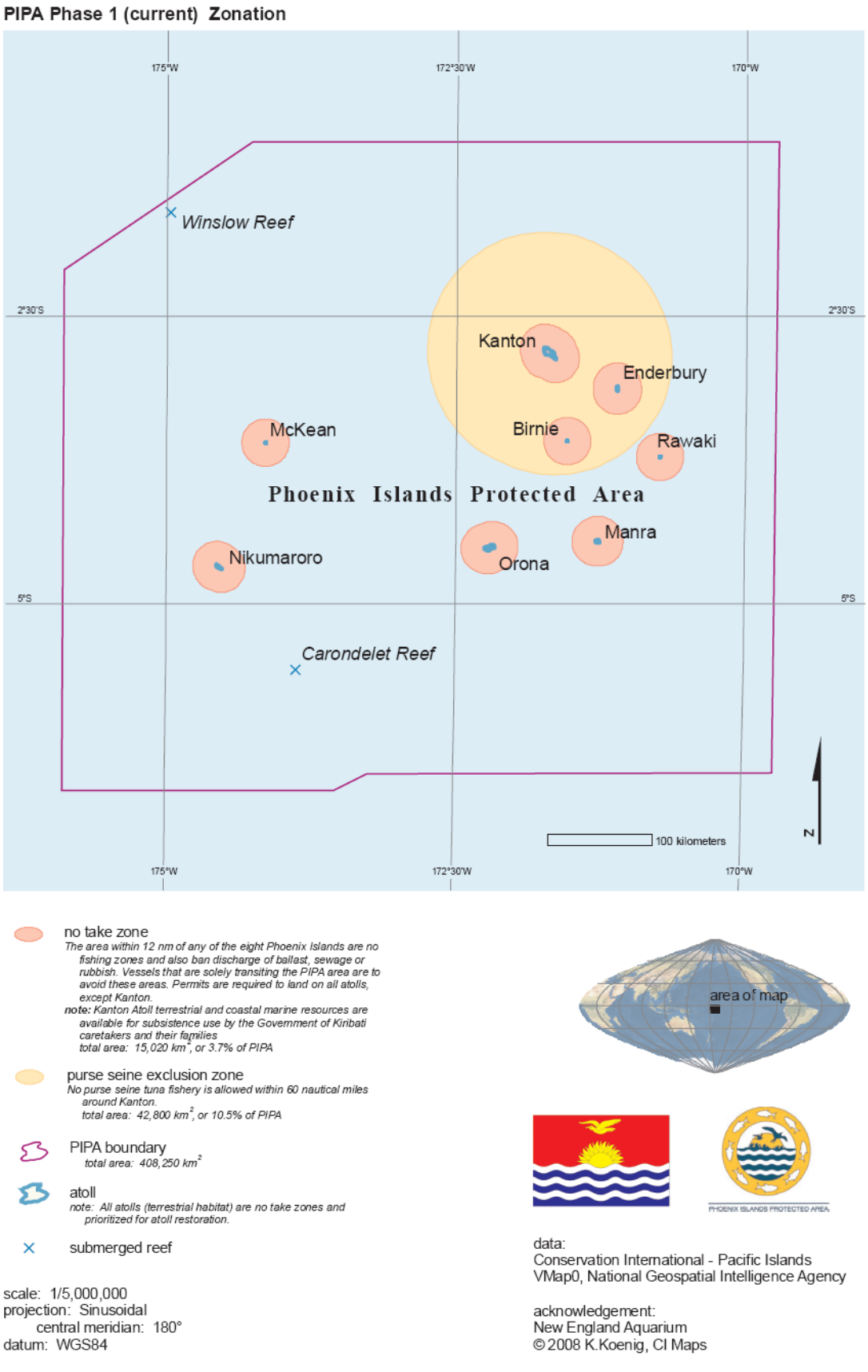
In addition it is expected that a more detailed zonation for Kanton Atoll will be completed during the Plan's implementation that is based on subsistence resource needs of the local caretaker community and possibly tourism needs.

Exact boundaries for Phase 2 PIPA Zonation will be finalized, based on the above, during this Plan's implementation.

Both Phase 1 and Phase 2 PIPA Zonations are seen as a simple zonation system with the primary objective of prioritized protection of these systems. It is envisaged that a more sophisticated zonation system will take into account possible tourism development. This will be discussed and implemented in either Phase 2 or Phase 3 Zonation of the next PIPA Management Plan cycle.

SUMMARY: For this Plan (PIPA Management Plan (2010-2014) both PIPA Phase 1 and Phase 2 Zonation are expected to be successfully implemented by December 2014.

Figure 4. PIPA Zonation



SAP 1.6 PIPA Surveillance and Enforcement

It is recognized that effective surveillance and enforcement of PIPA is a significant challenge in terms of technology, capacity and resources.

Minimization of illegal activities is key to the success of any MPA. This can be achieved through the application of several tools. In the case of PIPA, there are major constraints to surveillance. PIPA is extremely remote, inaccessible, and covers a very large area. Surveillance tools that could be applied include:

- Aerial surveillance (by aircraft and satellite);
- At sea surveillance (by boat); and
- Land-based surveillance.

MELAD PIPA Office & Director

Under the auspices of the MELAD Minister, Principal Environment Officer and guidance of the PIPA-MC, the PIPA Director is responsible for the definition, coordination, costing and management of surveillance and enforcement services for PIPA, which are sourced to relevant agencies within and outside of Kiribati. This will focus on building capacity within existing surveillance and enforcement programmes such as fisheries, and invasive species management. The MELAD PIPA Office and Director will also focus on issues faced in surveillance and enforcement of a large, remote MPA namely;

- Fishing (legal, illegal and related activities)
- Other Boat and Visitor Management
- Kanton Atoll Subsistence Resource Use
- Protected islands and bird populations

Fisheries Surveillance and Enforcement (Ministry of Fisheries and Maritime Police)

Kiribati's Ministry of Fisheries and Kiribati's Maritime Police have developed a Kiribati-EEZ wide surveillance and enforcement programme largely targeted at preventing illegal fishing and monitoring of licensed vessels. This programme is in cooperation with other Forum members states under the Forum Fisheries Agency (FFA) and under a range of bilateral and individual agreements including those provisions made with DWFN vessels. Provisions include:

- Vessel Monitoring System (VMS) all licensed boats must carry VMS system to identify vessel and location in real time, this can be matched to the operation by FFA of a geo-fence with alerts when vessels are known to enter a particular area.
- Fisheries Observer Scheme – currently DWFN carry trained Kiribati Fisheries Observers (ca. 20% coverage). Under the third arrangement to the Nauru Agreement Kiribati has committed to requiring all DWFN boats to carry an observer (100% observer coverage) by January 2010.
- Aerial surveillance provided by New Zealand (NZ) and Australia Air Forces (Orions) coordinated with regular and special surveillance operations run by the FFA.
- Operation of Kiribati Patrol Boat- regular patrol runs (currently only 1-2 per year to Phoenix Islands) and only called out when assistance required e.g. when there is a ship grounding.
- USA Kiribati Shipriders Agreement (2008) whereby Kiribati Maritime and Fisheries Officers are able to travel on USA Coastguard Ships and have the full power of arrest of vessel and other related powers under Kiribati Law. This initiative has already

proven highly successful with the impoundment and prosecution of a vessel caught illegally bunkering off Nikumaroro Atoll in PIPA ($4.7 AUD million fine).

The current effort and resourcing of surveillance and enforcement is a significant achievement for Kiribati, in being a small island developing state spread over a large area of ocean comprising three separate EEZ areas (relating to the Gilbert, Line and Phoenix Islands).

The key to a successful Fisheries-based surveillance and enforcement for PIPA requires the current foundation, outlined above, to be built upon noting:

- Vessels do not generally transit through the Phoenix Islands en route to anywhere else, rather it is a deliberate purposeful decision to be in the Phoenix Islands area.
- Additional requirements for surveillance and enforcement could be costed services for PIPA's management developed through the PIPA Trust Fund. This could include receiving vessel alerts by establishing a geo-fence based on the outer boundary of PIPA and on core zonation.
- Cost efficiencies, program design, and additional resources for PIPA surveillance can be developed further in partnership with the United States through the 2009 sister agreement.
- Additional support for the operation of the Kiribati Patrol Boat would enable more surveillance runs of PIPA. Primary support would include assisting in fuel and crew costs.
- PIPA Training Module for Fisheries Observers – Kiribati Fisheries have indicated strong interest in incorporating a PIPA Training Module for their Observers and this is expected to be developed and trialed before the end of 2009.

It is expected with additional PIPA resources for Fisheries Surveillance and Enforcement coupled with GoK's requirement for VMS, FFA geo-fencing capacity and 100% observer coverage that the surveillance of legally licensed vessels is manageable. The VMS licensed vessels are also expected to play a key role in reporting any unlicensed vessel in PIPA's waters, as indeed it is in their interest to do so. Illegal fishing remains a significant concern for the PIPA, other parts of Kiribati's EEZ and indeed other Pacific Island states.

PIPA vessels - IAS surveillance – each approved vessel to have an on-board system for detecting and eliminating IAS - trained observer to undertake inspection of vessel's biosecurity procedures and their effectiveness before approval is given to enter GoK/PIPA waters.

Terrestrial Surveillance and Enforcement
The islands, seabirds and turtle nesting beaches of the Phoenix Islands are highly vulnerable to general use and invasive species. The Wildlife Conservation Unit on Kiritimati Atoll has established procedures and staff for managing such resources, as well as for guiding and managing tourists and visitors.

Procedures for the application of these surveillance and enforcement tasks, updated with the ongoing PIPA Invasive Species Eradication Programme, will be key tools for managing PIPA.

Surveillance of Kanton Atoll
With planned increased human resources and infrastructure (including an atoll based boat) for Kanton atoll, there is a commensurate role for increased effort in surveillance and enforcement for Kanton. This will include monitoring the compliance of visitors and local resident caretaker population on Kanton for adherence to the proposed Kanton Atoll Sustainable Resource Use Plan.

Additional
In order to assist in the detection of illegal activities, visitors and residents are required to comply with the following.

- All individuals, and/or the vessel they are on, must report during their stay in the PIPA; sightings of all other individuals or vessels; any suspicious activities; any out of the ordinary conditions. This includes all of the Phoenix Islands, (except on the island of Kanton) and all of the waters within the PIPA area.

- Sightings must be reported on the day observed. Reports will be sent to the MFMRD Fisheries Licensing and Enforcement Unit, the Kiribati Maritime Police Service (KPS) and the PIPA Office (MELAD). The reporting format is as follows: individual name / vessel name / vessel number / time in GMT / suspicious activity (short description, GPS Co-ordinates).

- For any suspicious activity or out of the ordinary condition, if possible photographic documentation should be made and submitted to the PIPA Authority. Images can be sent as attached files to emails.

- It is not the responsibility of any visitor (individual or vessel) to the PIPA area to apprehend any person or vessel acting contrary to these rules. However, reporting is a requirement.

- Biosecurity measures at Kanton must follow the pending Biosecurity Act and its associated regulations. Note that guidelines are currently being developed to help with this process and enhancing PIPA biosecurity generally.

Enforcement must be closely linked with surveillance. Surveillance is integral in identifying possible illegal activities. Information from surveillance activities shall be conveyed to the enforcement section as soon as possible. GoK will continue to rely on existing measures for enforcement based on fisheries regulations and allowable permits and conditions therein. Further surveillance and enforcement measures will be reviewed in light of finalising the PIPA penalty schedule.

Capacity building for surveillance officers, observers and guides require development. The focus will be to combine the strengths of Fisheries observer programmes, Wildlife Conservation Unit (WCU) programmes and the particular requirements of remote-island guiding and tourism (e.g. the Galapagos Islands).

SUMMARY: For this Plan (PIPA Management Plan (2010-2014) GoK and its partners for PIPA will base surveillance and enforcement on existing measures (eg fisheries, immigration and customs) and supplement these on a costed service-provider basis for

the additional needs of PIPA with the aim of fostering a mutually supportive programme for Kiribati's tourism, fisheries development and management that is consistent with PIPA's Vision. A surveillance and enforcement programme design will be finalised in the same timeframe (July 2010) as the completion of a PIPA Penalty Schedule.

SAP 1.7 PIPA World Heritage Programme

GoK has submitted its nomination dossier for PIPA to the United Nations Education, Scientific and Cultural Organisation (UNESCO) World Heritage Centre in January 2009 and it is under evaluation as a natural site for listing by UNESCO, IUCN and the WHC Committee with the decision due at the WHC Committee meeting scheduled for June 2010.

For the PIPA Management Plan 2010-2014 the objectives for the WHC are to secure a successful nomination of PIPA on the WHC list. The PIPA Management Plan embodies Kiribati's first commitment to fulfilling the obligations of the WHC. GoK and partners are cooperating with UNESCO, IUCN and highlighting the PIPA nomination and its importance with other Parties. Importantly this Plan has been harmonized with the PIPA WHC nomination dossier.

GoK and partners intend to continue to promote PIPA's WHC listing and a strong delegation from GoK and partners CI and NEAq is expected to attend the UNESCO WHC meeting in June 2010.

Should the nomination prove unsuccessful in June 2010 GoK and its partners will discuss the next course of action following the set decision making procedures for PIPA outlined above (PIPA-MC, Minister, Cabinet).

It is important to note that the Environment (Amendment) Act 2007 gives special recognition and protection to listed World Heritage sites (Section 48) with a fine provision of up to $100,000AUD and a maximum of 5 years in prison for an offence relating to a listed Kiribati World Heritage site (Section 28). Should PIPA become WHC listed then this penalty will be applied.

SUMMARY: For this Plan (PIPA Management Plan (2010-2014)) GoK and its partners for PIPA will ensure as far as possible the successful listing of PIPA as a World Heritage Site.

SAP 1.8 PIPA Partnerships, Transboundary and International Collaboration

GoK fosters and leads a partnership strategy for the implementation of the PIPA, to offset the limited resources and capacity in Kiribati to manage this large, remote site. PIPA has been designed and established by GoK in a core partnership with CI and NEAq under an agreed MOU and extension to support the design, establishment and ongoing operation of PIPA. CI and NEAq remain committed to this partnership for the period of this Plan and have signaled their intentions to continue supporting the PIPA in the longer term.

GoK, CI and NEAq will continue to foster partnership and resourcing for PIPA throughout this Plan. Partnerships and support for PIPA have been developed with the Governments of Australia, New Zealand, Save Your World Company, UNEP and the GEF Pacific Alliance

for Sustainability. Kiribati's membership of regional agencies such as SPREP, Secretariat of the Pacific Community (SPC), Secretariat of the Pacific Islands Applied Geoscience Commission (SOPAC), FFA and the Western and Central Pacific Tuna Commission all have programmes relevant to PIPA that Kiribati can both benefit from and contribute to their implementation. Examples include SPREP's Regional Marine Species Conservation Programme (e.g., for turtles, whales, dolphins), FFA's VMS programme.

The proposed listing of PIPA as Kiribati's first listed World Heritage Site is Kiribati's priority commitment for international collaboration included in the PIPA Management Plan (refer SAP 1.7). PIPA is also managed as an IUCN Protected Area Wilderness Site (1b). PIPA is Kiribati's primary protected areas commitment to implementing the CBD and is committed as part of the Global Islands Partnership (GLISPA).

A priority partnership for this Plan is with UNEP under the GEF Pacific Alliance for Sustainability. Under the PAS, the GEF have committed $1 Million USD to PIPA focused on the implementation of this Plan. UNEP is the designated Implementing Agency.

Additional priority transboundary and international collaboration measures include:

- Development of a proposed "sister-site' agreement with USA's Papahanamokuakea National Monument.
- Development of a Pacific Oceanscape under the Pacific Forum. In August 2009 the Pacific Leaders Forum endorsed a Pacific Oceanscape concept tabled by Kiribati together with its companion Pacific Ocean Arc initiative aimed at fostering increased investment in protected areas and needed transboundary and international cooperation. The Pacific Forum Secretariat will develop this initiative in 2009/10 as part of the Pacific Plan's implementation. Networking and learning with other protected area initiatives e.g. the Coral Triangle Initiative and the Micronesia Challenge is envisaged under the Pacific Oceanscape.
- Development of a Phoenix Ocean Arc based on cooperation with the USA's Pacific Marine National Monument programme with the aim of whole-archipelago management. As part of the Pacific Oceanscape, Kiribati announced its intention to foster a Phoenix Ocean Arc with PIPA as its first contribution and invited the USA (Howland and Baker Islands) to join Kiribati in this effort. Kiribati further announced its intention to develop a Line Islands Ocean Arc in a similar manner to the Phoenix Arc.

SUMMARY: For this Plan (PIPA Management Plan (2010-2014)) GoK will continue to foster its core partnership, transboundary and international programme for PIPA's implementation. Kiribati will assist the development of the Pacific Oceanscape and in particular the Pacific Ocean Arc initiative with the first arc under development being the Phoenix Ocean Arc.

SAP 1.9 PIPA Information Management, Education and Outreach

The PIPA Office (MELAD, Tarawa) is the primary caretaker of all information, files and records pertaining to PIPA. These are backed up by records kept by both NEAq and CI and material deposited with the SPREP Library and Resource Centre in Apia, Samoa. To date more than 700 references have been sourced, digitized and organized in a searchable database for PIPA. This database will be added to as the PIPA work progresses and it is

envisaged that most PIPA information sources will be made available online in an updated PIPA website.

Education, Outreach and the promotion of the values of PIPA and the work undertaken under Kiribati's leadership are an important priority for PIPA. A PIPA Education and Information Officer will be recruited by the MELAD PIPA Office under this Plan. Targets for this programme include:

- Review of Kiribati's Education Curriculum for opportunities to use PIPA information as part of core learning programmes in Kiribati.
- Design and implementation of a Kiribati PIPA Awareness programme, including domestic, regional and international media work for news of PIPA
- Update and expansion of PIPA website to include "Friends of PIPA", regularly news postings, archival information and resources.
- Review and participation in regional and international initiatives relevant to the promotion and to further understanding of PIPA and Kiribati.

SUMMARY: For this Plan (PIPA Management Plan (2010-2014) the MELAD PIPA Office (under the guidance of the PIPA Management committee and in partnership with CI and NEAq) will develop as part of the PIPA Operational Work Plan an education and outreach initiative for PIPA. It will also maintain and build the information management systems already established (e.g., PIPA website, literature database).

SAP 1.10 PIPA Science and Research

PIPA's management practice is based on the best available scientific and technical knowledge and in accordance with the Guiding Principles list above. Priorities for PIPA Science and Research will be those initiatives that provide insight and answers needed for practical management.

Science and research is seen as a cross cutting tool applicable to aspects of SAP 1, 2 and 3 and will be built into these Strategic Action Plans. Relevant activities will be reflected in the PIPA Annual Operational Work Plan rather than a standalone initiative to ensure that effort for science and research meets management needs. Operationally all science and research undertaken within PIPA will be operated on a permit basis (ref SAP1.4).

Fundamentally the Science and Research programme will focus on information needs for PIPA monitoring and evaluation and the information needed for the State of the PIPA report (SAP3). As far as possible inter disciplinary planning and multi targets for science and research will be undertaken due to the high expedition costs to PIPA.

SUMMARY: For this Plan (PIPA Management Plan (2010-2014)) science and research are seen as critical tools across many of the PIPA Strategic Action Programme initiatives. As part of the PIPA Annual Operational Work Plan, science and research will be designed and targeted to meet priority management needs.

SAP 1.11 PIPA Tourism

The development of environmentally-friendly, high-end tourism is a high priority for GoK. It is regarded as part of the sustainable management of the PIPA, contributing to Kiribati's development, employment and income generation.

Despite the high international profile of PIPA and related interest, tourism is very limited in the Phoenix Islands largely due to access issues. Tourism is limited to private yacht visits, tourism/research operated charters and the passage of occasional cruise ships. All visitors to the Phoenix Islands are required to clear customs and immigration on Kanton Atoll and must have a permit (ref SAP1.4) to visit. The PIPA Office vets all such permits under a standard operating system.

In 2009 GoK is expected to pass a new National Tourism Strategy, inclusive of a vision for the development of tourism in PIPA. Already significant domestic and offshore private sector interest in developing tourism associated with PIPA is evident. Measures being discussed and promoted include reopening the Kanton Airport, developing high-end land based tourism facilities on Kanton, possible joint venture initiatives (e.g., for boats) and tighter controls and improved facilities on boat-based tourism.

The PIPA Management Committee and PIPA Office fully recognize that if World Heritage listing is successful for PIPA in June 2010 that the profile and attractiveness for tourists to visit PIPA will increase significantly, if not exponentially. It is further recognized that much could be learnt from environmentally sound tourism development in other remote and large protected areas such as the Great Barrier Reef. It is considered that there is now a window of opportunity to sensibly plan and develop tourism in PIPA in a phased approach consistent with PIPA's Vision and the new Kiribati National Tourism Strategy. Resources are being secured to affect this. In the interim the existing visitor and tourism operator permit and fee system and associated monitoring will continue.

SUMMARY: For this Plan (PIPA Management Plan (2010-2014)) planning for tourism development in PIPA, consistent with PIPA's Vision and with the new Kiribati National Tourism Strategy is seen as a high priority for implementation. Given the potential World Heritage listing in 2010, the PIPA Office will work with the Kiribati Tourism Bureau to plan and develop a plan for tourism development, associated resources and partnerships required. This PIPA tourism plan will be reviewed by the PIPA Management Committee and implemented in a multi-agency approach as part of the overall PIPA Management Plan 2010-2014.

SAP 1.12 Kanton Atoll – Sustainable Resource Plan

Kanton Atoll is the only PIPA island currently inhabited. The population consists of a small government caretaker and administrative population of approximately 30 people. Government officers on Kanton have the responsibility for immigration, customs, fisheries and all government interests and roles in the Phoenix Islands. People on Kanton by necessity rely on both marine and terrestrial resources for subsistence needs.

In the baseline or Phase 1 Zonation Kanton has a 60 nm purse seine exclusion zone declared under the Fisheries Act. It also has a 12 nm no take zone except for harvest of resources for the Kanton community's subsistence needs.

It is recognized that Kanton is the gateway to the PIPA and being the only inhabited island needs special consideration in the PIPA Management Plan. The Kanton community, and proposed new government staff dedicated to PIPA work, are key in the development of PIPA and associated infrastructure including provision of adequate communication and access (e.g. wharf, air strip, anchorage). Development of land-based tourism is also seen as a priority to provide an income return to GoK and employment as part of PIPA's management.

With this array of actual and potential uses, Kanton Atoll is prioritized for a Sustainable Resource Use Plan on an island-wide basis out to the zonation of 12 nautical miles. In this Plan, all activites, and all individuals engaged in those activities should be explicitly named and defined, and annual permits given specifying their name, type of use, area of use and any limits required to keep activities and impacts within the objectives of PIPA Management Plan.

SUMMARY: For this Plan (PIPA Management Plan (2010-2014)) a Kanton Atoll Sustainable Resource Use Plan will be developed by December 2010 and implemented as resources and priorities allow as part of PIPA Core Management.

SAP 1. 13 PIPA Monitoring and Evaluation
Section 45(1)(f) and 48(4)(d)(for World Heritage areas) of the Environmental Act 1999, as amended, requires scientific and research studies to support protected areas. These provisions have been implemented through Section 6(2)(d) of the PIPA Regulations 2008, requiring that the PIPA Management Committee monitor the management of PIPA. Section 6(6) of the PIPA Regulations 2008 further requires that a monitoring programme be implemented in accordance with the Environment Act, PIPA Regulations and Management Plan.

The PIPA Regulations (2008) require monitoring of the following environmental and management indicators:

i. bird population trends;
ii. ecosystem/vegetation monitoring;
iii. live coral cover trends;
iv. selected reef fish population trends;
v. reef shark population trends;
vi. turtle population trends;
vii. pelagic conditions within the PIPA, including fisheries landing trends;
viii. annual visitor number trends; and
ix. such other matters as the PIPA MC shall choose to report

There are two basic components for Monitoring and Evaluation of PIPA under this Plan:

- Scientific research and monitoring to detect trends in core and important PIPA values and issues (e.g., seabird populations, visitors numbers)
- Management Plan Implementation Monitoring - task and process monitoring and evaluation of the management system used by PIPA to ensure improvement in a cost effective and efficient manner, and to implement adaptive management (including addressing new issues and threats as they may arise).

Scientific Monitoring
Existing monitoring since the establishment of PIPA has included: water temperature loggers and monitoring of pre and post coral bleaching, assessment and follow up monitoring of key seabird and invasive species populations (as part of the atoll restoration programme), marine

and terrestrial surveys and observations as part of boat visits to PIPA, and ongoing fisheries surveillance of Kiribati's EEZ (inclusive of PIPA). Information and effort cost from existing monitoring efforts are being factored into an integrated monitoring programme under this Plan. All records will be located within the MELAD PIPA Office.

Tables 3.1 and 3.2 below summarise monitoring effort and proposed parameters. A full Monitoring and Evaluation Plan will be developed and agreed by the PIPA Management Committee not later than June 2010 and requirements will be reflected in the PIPA Annual Operational Plan. At this time a PIPA Baseline report will be completed to provide a frame of reference for these monitoring programmes and a baseline for the preparation of the 2014 State of the PIPA Report (ref SAP 3). Parameter measurements conducted at a four yearly periodicity is considered a minimum. Many other parameters will be measured more frequently and also measured opportunistically as part of research, other surveys, and visitor programmes to the site.

Table 3.1 Marine Ecosystem Monitoring Summary

Indicator	Parameter	Periodicity	Location of Record
Coral Reef Health	Coral cover, benthic cover	Previous (2000,2002,2005) @ 4 years	PIPA Office, MELAD NEAq, CI
	Coral Diversity and Health (Disease, Bleaching)	Previous (2000,2002,2005) @ 4 years	PIPA Office, MEALD NEAq,CI
	Water temperatures	Continuous water temperature loggers since 2000, satellite data, continuous since 1990s.	PIPA Office, MELAD NEAq, CI
Selected indicator Reef Fish and threatened species eg clams	Diversity, Abundance, Size class structure, Endemism	Previous (2000,2002,2005) @ 4 years	PIPA Office, MELAD NEAq, CI
Sharks	Diversity Abundance Lagoon nursery populations	Previous (2000,2002,2005) @ 4 years	PIPA Office, MELAD NEAq, CI
Turtles	Diversity Abundance – nesting surveys	Previous (2000,2002,2005) @ 4 years	PIPA Office, MELAD NEAq, CI
Tuna/Offshore Fishing	Effort Catch Bycatch	Continuous by GoK Fisheries as part of DWFN management, note 100% observer coverage is now mandatory in Kiribati waters.	Fisheries, SPC/FFA, PIPA Office, MELAD
Submerged Reefs/Seamounts	Baseline surveys Species diversity And abundance	2002 (partial survey down to 900 m) Effort will be based on resources available – deep sea mission planned for mid 2009.	NEAq, PIPA Office, MELAD

Table 3.2 Terrestrial Ecosystem Monitoring Summary

Indicator	Parameter	Periodicity	Location of Record
Seabirds	Species Diversity and relative abundance using pelagic transects and fly-on surveys of key indicator species Population Surveys by prescribed counts of colonies and nesting pairs	Previous (1960s, 2006, 2008), Future - species diversity opportunistically Population counts at least every 3-5 years	Pierce 2006, 2008 (PIPA Office, MELAD NEAq, EcoOceania, CI)
Terrestrial biota	Vegetation – photo-points, plant lists Vertebrate fauna (lizards, land-birds, shorebirds) - relative abundance, counts	Previously 1960s, 2006 2008 Future – at least every 3-5 years	Pierce 2006, 2008 (PIPA, MELAD, EcoOceania)
Invasive species	Species presence and abundance Eradication monitoring Monitoring key indicator species amongst seabirds (above)	Previous (2000,2002,2006, 2008) Future annually as part of atoll restoration until at least 2012 then every 3-5 years where possible using existing charters and biosecurity patrols.	Pierce 2006, 2008 (PIPA Office, MELAD, NEAq, EcoOceania, CI)

Actual field work will be contracted out and/or completed in collaboration with local and other agencies under the direction of the PIPA Management Committee and PIPA Director. All opportunities for local capacity building in these surveys will be taken to benefit Kiribati more widely. For bird and invasive species surveys, the Government of Kiribati Wildlife Unit under MELAD is on Kiritimati Island. The WCU already participates in bird or wildlife surveys for PIPA via CEPF and NZAID funding and there are plans to extend this relationship. Regional organizations, such as the University of the South Pacific (with the Atoll Research Unit in Tarawa, and main campus in Suva, Fiji), are willing to assist in field work. PIPA partners NEAq and CI will continue to assist in expertise and resources for surveys and monitoring. The PIPA office is seen as a catalyst or coordinating body, rather than a large organization doing all the research and monitoring surveys itself. Reports and the raw data will be housed within the PIPA office. Ultimately, it is the responsibility of the PIPA Director to ensure that all field data and survey reports are provided to the PIPA Management Committee (as part of any research permit).

Several terrestrial and marine surveys have been conducted over the past decades in the Phoenix Islands. Results for many of these surveys are available. However, since the methodologies used by researchers were different, it is difficult to compare results over time to measure changes to these resources. Another difficulty in past surveys is that many were not quantitative. With this Plan the objective is to standardize quantitative methods for each key species or group of organisms so that results can be comparable over time. This standardization process will draw heavily from existing methodology used by PIPA MC agencies eg Pacific Expeditions/Eco Oceania Ltd, Fisheries and consistent with those promoted by regional agencies eg SPC Fisheries.

Management Plan Implementation Monitoring
Based on the PIPA Annual Operational Work Plan the implementation of the Management Plan will be monitored by the PIPA Office and the results will be annually reported and evaluated under the PIPA Annual Operational Work Plan requirements.

3. Management Plan Implementation Monitoring

Indicator	Parameter	Periodicity	Location of Record
PIPA Management Committee Function	No of meetings Stakeholder review of decisions implemented	Continuous	PIPA Office, MELAD
Visitor Number Trends & Permit Monitoring	Permit Monitoring (tourism, research)	Continuous	Kanton Immigration, PIPA Office MELAD, CI
Surveillance & Enforcement and Penalties	Fisheries S & E report Infraction Report (at least annual)	Annual	PIPA Office, MELAD Fisheries, Kiribati Maritime Police
Financial Management	Annual audit of funds secured and spent on PIPA.	Annual	PIPA Office, MELAD

SUMMARY: For this Plan (PIPA Management Plan (2010-2014)) a Monitoring and Evaluation programme design will be completed no later than June 2010 that addresses the twin needs of monitoring and evaluation as required under the PIPA Regulations (2008) and the need to provide targeted information to monitor and evaluate the implementation of this Plan. It is envisaged that this information collection and analysis will also be used as the primary data source for donor reporting requirements.

SAP 1.14 PIPA Sustainable Financing, Resourcing and Business Plan
PIPA is currently financed by GoK, CI and NEAq with additional partnership and resources obtained from a variety of government, multilateral and private agencies.

A key component of PIPA's sustainable financing was the establishment under Kiribati law of the PIPA Conservation Trust Fund 2009. GoK passed legislation for the PIPA Trust Fund in May 2009 and the Board is expected to be constituted before the end of 2009. The PIPA Trust Board is expected to enter into a Conservation Contract with MELAD with income from the Trust Fund prioritized to cover PIPA management costs and any lost DWFN revenues associated with the future closure of areas of the PIPA EEZ to tuna fishing. The PIPA Trust Fund income is also required to cover the operational costs of the Trust.

Due to significant resourcing requirements associated with fully capitalizing the trust at a level that will immediately cover all associated costs of PIPA, a phased approach to building the endowment and covering the above mentioned costs has been agreed to by the founding members of the Trust: the Government of Kiribati, CI, and NEAq. For this Management Plan, the founding members are committed to initially capitalizing the Trust at $13.5M USD before the end of 2014. This would allow the Trust to cover potential lost DWFN fees (exclusive of fishing pursued under the Pacific Islands Treaty which is in force until 2013)

from closing additional 25% of the PIPA EEZ as a no take zone and would be implemented through the development of a Phase 2 Zonation plan. At this Trust Fund level, it is also anticipated that the Trust could support core PIPA management costs at approximately $300,000 USD per annum.

For this Plan it is also fully expected that additional resources will need to be secured, on a prioritized basis of supporting firstly PIPA core management followed by targeted activities under the issues and results programme (SAP2). In this regard the following partnerships and resources are secured or being fostered:

- CI/NEAq – ongoing support from the Global Conservation Fund of Conservation International (GCF) and other sources estimated at $500,000/5 years
- Save Your World – corporate sponsorship targeted at surveillance and enforcement costs estimated at $750,000/5 years
- UNEP GEF PAS PIPA project $1M USD commitment
- CEPF – targeted at the atoll restoration and trust fund design, approximately $500,000
- Government of Australia – support to PIPA World Heritage Nomination $50,000AUD.
- Endowment contribution from CI's GCF (subject to matching finance) $2.5 M USD.
- Endowment contribution from Kiribati Reserve Fund

Discussions are also underway with a range of potential donors and partners including the Governments of Australia, New Zealand, USA, European Union and others.

Against the framework of this PIPA Management Plan, a PIPA Business Plan will be developed led by the PIPA Director under the guidance of the PIPA MC, and under the approval of the Principal Environment Officer and MELAD Minister. This will aim to effectively manage fund raising and resourcing of PIPA's Management Plan implementation and will be developed as a companion to this Plan. Its yearly priorities will be reflected in the PIPA Annual Operational Work Plan and reported on in the same manner (ref 4.1.13).

SUMMARY: For this Plan (PIPA Management Plan (2010-2014)) the PIPA Annual Operational Work Plan and associated budget will reflect the resourcing needs on an annual basis. For the longer term a companion PIPA Business Plan to this Plan will be developed no later than October 2010 that will fully address the needs and issues arising for the effective resource operation of the PIPA.

SAP 1.15 PIPA Annual Operational Work Plan and Report

On an annual basis the PIPA Director under the guidance of the PIPA MC and under the approval of the Principal Environment Officer will prepare a PIPA Operational Work Plan that clearly identifies PIPA work to be carried out in that year in relation to the PIPA Management Plan.

These work plans will identify specific activities, budgets, secured/unsecured resources and partnerships for undertaking the PIPA Core Management Programme (SAP1) and activities and desired targets identified under the PIPA "Issues and Results" Action Programme (SAP2).

In the last year of the Plan and based on an agreed framework under the PIPA Monitoring and Evaluation programme the PIPA Annual Operational Work Plan will include a significant focus on completion of the five yearly "State of the PIPA" report (SAP3).

Prior to the development of subsequent years PIPA Annual Operational Work Plans, the PIPA Director will prepare a report on implementation progress of the current plan emphasizing achievements, targets completed, costs and issues arising for the next work plan.

Importantly each PIPA Annual Operational Work Plan and subsequent implementation report will clearly identify performance indicators consistent with achieving on an annual basis the requirements of the Conservation Contract and thus through the PIPA Trust Board's review the flow or endowment derived income dedicated to the management costs of PIPA.

SUMMARY: For this Plan (PIPA Management Plan (2010-2014)) the PIPA Director under the guidance of the PIPA MC and approval of the Principal Environment Officer will produce an annual PIPA Operational Work Plan. At the end of each year an Annual Report of its implementation will be produced by the PIPA Director prior to the development and agreement by the PIPA MC and Principal Environment Officer of subsequent years plans.

SAP 2. PIPA 'ISSUES TO RESULTS'

In addition to the core management requirements outlined above a number of key prioritized issues for PIPA requiring targeted action are identified for this PIPA Management Plan. For each 'issues to results' a summary end desired target state is identified for this Plan, the baseline status of the issue summarised as at January 2010, and a series of actions outlined. It is envisaged that significant fund raising effort will be used to package these 'issues to results' initiatives to secure additional project grant funding, resources and expertise to their implementation in addition to core resources secured for the PIPA Core Management outlined above. For each of these 'issues to results' programs detailed work plans and budgets will developed as part of the PIPA Annual Operational Work Plan. Implementation progress in each will be reviewed as part of the core PIPA Monitoring and Evaluation and implementation subject to adequate resourcing. Design and implementation of these initiatives will be synergistic across the PIPA effort combining resources, accessing expertise, and maximizing efficient and coordinated effort and use of funds available. Importantly work undertaken in the programmes below will contribute to SAP 3 – State of the PIPA Report. Identified PIPA 'issues to results' programmes are:

- **SAP 2.1 PIPA Atoll& Reef Islands Restoration & Biosecurity**
- **SAP 2.2 PIPA Coral Reefs and Coastal Management**
- **SAP 2.3 PIPA Endangered and Threatened Species**
- **SAP 2.4 PIPA Offshore Fisheries**
- **SAP 2.5 PIPA Cultural and Historical Heritage**
- **SAP 2.6 PIPA Seamount & Deep Seas**
- **SAP 2.7 PIPA Climate Change**

SAP 2.1 PIPA Atoll& Reef Islands Restoration & Biosecurity

Target: by the end of 2014 a PIPA Atoll and Reef Islands Restoration programme will be implemented that ensures the continued recovery of native island biota, e.g seabirds through targeted invasive species eradications and follow up monitoring. Further a PIPA Biosecurity Programme will be designed with the primary aim of preventing any further introductions of alien species and the implementation will be integrated into the PIPA Core Management programme.

Baseline:
Terrestrial threats to the PIPA are dominated by the impacts of invasive alien species (pest plants and pest animals). Of the pests, the invasive mammals are currently the most impacting as they can change entire ecosystems and eliminate many species of vertebrates, particularly birds, in the PIPA. The presence of mammalian species on all of the islands in recent decades has resulted in greatly depleted flora and fauna, including to the threatened and sensitive seabirds such as Phoenix petrels (Endangered IUCN Red List category (EN)), white-throated storm-petrels (Vulnerable IUCN Red List category (VU)) and blue noddies. Their declines, together with those of more common seabirds, have lead to degraded ecological processes that formerly linked the terrestrial and marine ecosystems. For example, the nutrient levels feeding the coral reef and ocean systems are now greatly reduced because of the extensive declines in the size of seabird colonies. Other more complex interactions are likely to include the failure of colonies of frigatebirds (two parasitic species locally) due to pest-induced failures of colonies of other seabird species on which they depend. Meanwhile, browsing rabbits and rats have caused the loss of nesting cover for petrels, storm-petrels, noddies, shearwaters, terns etc.

The potential for restoration of these islands is however very high as they each support only 1-3 pest mammal species and few other pests. All except one of the islands are uninhabited and most are difficult to land on from boats. These features mean that the there is little likelihood of new invasive species arriving and high efficacy to a well-designed biosecurity programme. Recovery of species is likely to occur at high rates compared with other inhabited islands in Kiribati and the Pacific generally.

The SAP PIPA Atoll Restoration initiative has the primary purpose to restore the entire terrestrial ecosystem of the PIPA islands through the removal of pest mammals. An important companion initiative is implementation of the PIPA Biosecurity programme which aims to ensure these islands are maintained in a pest-free state following the eradications. PIPA Biosecurity planning and implementation will address all of the potential invasive species that could arrive, including mammals, ants and other invertebrates, reptiles, mynas and pest plants.

Pests and indigenous biota were documented during a CI CEPF-funded terrestrial conservation survey of the PIPA in 2006. Pest findings are summarized in Table 4 below. Although some pests appear to have died out or been removed (e.g., cats on Enderbury and Pacific rats on Orona), mammalian pests were still present on each of the 8 atolls in 2006 (Pierce et al 2006).

Table 4. Known pest mammal status in PIPA 2006

Island	Pest status 2006	Comments
Rawaki	Rabbits (targeted 2008)	Eradication success to be confirmed late 2009/10
Birnie	Pacific rat	

McKean	Asian rat (targeted 2008)	Eradication success to be confirmed late 2009/10
Enderbury	Pacific rat	Cats also previously reported but have died out
Orona	Cat	Pacific rat were once present but may have been eradicated early 2000s with brodifacoum used by coconut growers (status needs confirmation); no dogs, pigs in 2006
Nikumaroro	Pacific rat	No cats detected 2006
Manra	?	Not surveyed 2006; cats, rats and pigs previously reported.
Abariringa	Cat, *Rattus* spp.	Not surveyed 2006; possibly Pacific rat and larger rat species present

Prioritization of island pest eradications is based on a combination of several factors including:

- urgency - securing the most threatened seabird species form current threats,
- ecosystem values – extent and intactness of natural ecosystems
- potential for ecosystem recovery and recolonisation by indigenous species, etc
- cost-effectiveness/feasibility
- defence/biosecurity

On this basis, two small islands (Rawaki and McKean) were rated urgent for pest eradication, because they supported a high diversity of seabird species (including threatened species) that were at risk from rabbits (Rawaki) and the recently invading Asian rat (McKean). Three other islands (Birnie, Enderbury and Orona) were also rated high in 2006 due to high ecosystem values and/or potential for ecosystem and species recovery). Manra was not able to be visited. Subsequently a NZAID-funded eradication programme attempted to eradicate pests on Rawaki (rabbits), McKean (Asian rats) and Birnie (Pacific rats) in 2008. The Birnie eradication was aborted, however, and confirmation of eradications on Rawaki and McKean will not be known until at least late 2009.

Important habitats and seabird features of the island as well as an eradication timetable are displayed in the following tables 5 and 6.

Table 5. Key habitat and seabird features of the islands (Pierce et al 2006).

Island (pest)	Land area (ha)	Risk of pests invading[1]	Main vegetation types	Seabirds
1. Pest targeted 2008				
Rawaki (ex-rabbits?)	<50	Low	Grass, low scrub, recovering veg 2008	Most diverse in PIPA – 17-18 spp.
McKean (ex-Asian rat?)	c.20	Low	Grass, low scrub	Moderate diversity – declines since 20th C
2. Other highest priority islands for restoration/pest removal				
Enderbury (Pacific rat)	500+	Moderate	Mainly grass and low scrub, trees, few coconuts	Diverse seabirds and recovering since cats died out; near Rawaki
Birnie	<50	Low	Grass, low scrub	Depleted birds, but

(Pacific rat)				close to Rawaki
Orona (cats)	c.600	High	Forest, scrub, coconut plantation	Good habitat for tree-nesters, also lizards, invertebrates
3. Priority islands for detailed ecological survey				
Manra (cats? rat spp.?)	c.500	Low	Forest, scrub, coconut plantation	Needs survey – few birds on fly-on counts
Kanton (cats, Pacific rats, large rat?)	c.900	High	Forest, scrub, coconut plantations	Depleted, but some tube-noses in SE (needs survey)
4.Others				
Nikumaroro (Pacific rats)	c.400	High	Forest, scrub, coconut plantation	Good habitat for tree-nesters, lizards etc

Note 1: this is simply a reflection of ease of landing (some of it illegally) and transporting pest mammals/ants etc ashore. Landing is difficult to achieve at the small islands. Coconut plantations may attract illegal landing at the three large southern islands and Kanton.

Table 6: Programme for eradication implementation by the biosecurity programme

Action/Task	Where	Timing	Who
Fisheries biosecurity	Source ports	Ongoing	PIPA/Fisheries
Port biosecurity	Tarawa	By 2010	Quarantine/Ag
Port biosecurity	Kiritimati	By 2010	Quarantine/Ag
Port biosecurity	Kanton	By 2011	?
Signage	7 islands	By 2012	PIPA
Coconut removal	Enderbury	By 2011	PIPA/delegate
Rodent surveillance and biota response	7 islands	Ongoing	PIPA/Ag/WCU?
Ant surveillance	7 islands	Every 5 years	PIPA/Ag/WCU?
Pest removal			
2008 success	Rawaki, McKean	2009-2010	PE/PIPA
Feasibility pest removal	Enderbury/Birnie	2009-2010	PIPA delegate/PE
Cat removal	Orona	By 2010	PE

2010 – 2014 Actions:

- *Rawaki –monitor outcome of rabbit removal which aims to secure and make more productive this site which is currently the sole viable breeding location for a million or more birds of 17-18 seabird species in PIPA – includes the threatened or sensitive species Phoenix petrel, white-throated storm-petrel, blue noddy, three shearwater species and grey-backed tern and other terns, frigatebirds, etc.*
- *McKean – monitor outcome of Asian rat removal which aims to reverse the previously crashing populations of nearly all seabirds on this island and will see the rapid return and increased breeding success of all local tern and noddy species, including blue noddy, and the gradual increase in numbers of storm-petrels, Audubon's shearwater and other shearwaters. The more successful nesting of frigatebirds should follow due to the threatened birds becoming more common.*

- *Enderbury – eradicate Pacific rats from this large atoll which is one of the gems of the PIPA with a large, little- modified grassland-shrubland ecosystem, but with depleted birds. The removal of rats will see the vegetation recover and a return of all of the seabird species currently breeding on neighbouring Rawaki, including Phoenix petrel, storm-petrels, shearwaters, grey-backed terns and brown noddies and blue noddies (all visit, but with little or no successful breeding), lizard and invertebrate communities recover.*
- *Birnie – eradicate Pacific rats from this small atoll. It is also located near Rawaki and most of the seabird species present there will also colonise Birnie.*
- *PIPA Biosecurity programme - fully integrated and ongoing implementation of biosecurity measures with the primary aim of preventing IAS species introductions. This addresses particularly the key potential source areas, including Tarawa and Kiritimati, and many international ports in the Pacific region, and measures to minimise the transport of IAS on vessels. It also addresses pest surveillance and contingency measures at the PIPA, including e.g. no landing signage and removal of coconut trees (which may attract illegal landing) at Enderbury. See table above for biosecurity workplan.*

SAP 2.2 PIPA Coral Reefs and Coastal Management (out to 12 nautical miles).
Target: by the end of 2014 PIPA's coral reefs and coastal habitats around 7 of the 8 PIPA Atoll and Reef Islands will have been effectively fully protected for the 5 year period through complete protection and their recovery from past unsustainable practices, e.g., shark finning, and meteorological impacts, e.g., coral bleaching will be better understood via work undertaken in the PIPA Monitoring and Evaluation programme. For Kanton Atoll, a Sustainable Resource Use plan will be developed and implemented inclusive of addressing coral reef and coastal management needs. Further climate change adaptation measures as recommended by SAP2.7 Climate Change programme will be assessed and implemented as resources allow.

Baseline:
The coral reefs of PIPA are among the least disturbed coral reefs in the world. Currently more than 200 coral species have been recorded in the PIPA but undoubtedly many more deep water coral species associated to seamounts remain unidentified within PIPA. The reef system is so remote and untouched by human activities that it can serve as a benchmark for understanding and potentially providing guidance for restoring other degraded hard coral ecosystems. The Phoenix Island reefs provide a model of what atoll reefs in this part of the Pacific Ocean are like with minimal human disturbance. The PIPA coral reefs offer a unique opportunity for coral reef research and conservation which is important on an international scale.

Most coral species have been listed as threatened or near-threatened as a result of global warming. PIPA, lying in the equatorial Pacific where ENSO cycles are generated, provides a unique geographic location for acclimatization and evolution of resistance to warming temperatures in corals. The widespread survival of corals in PIPA during the unprecedented warming in 2002-3 suggests this region may hold a key role in the long term adaptation and survival of coral species. Their ability to regenerate is much better than reefs in more populated areas due to the general lack of other environmental stresses on the reefs. This

provides an important and likely unsurpassed opportunity to research and understand climate change impacts on coral reef systems in the virtual absence of other anthropogenic factors.

PIPA also contains nationally, regionally and internationally important assemblages of species associated with coral reef and lagoon systems. Of note are clams, fish and sharks, which are summarised below.

The Kanton and Orona lagoons host spectacular giant clam (*Tridacna maxima* and *T. squamosa*) communities in sizes rarely seen elsewhere in the world. The density of these giant clams in Orona lagoon is an outstanding feature of PIPA and augurs well for the long term conservation of this increasingly threatened species.

Currently 518 shallow reef fish species are recorded from PIPA while several remain unidentified. A formula for predicting the total reef fish fauna based on the number of species in six key indicator families (Allen, unpublished data) indicates that at least 576 species, over 50 more than currently listed, can be expected to occur in the coastal reef ecosystem of PIPA. Fish diversity of seamounts is unknown but expected to have high levels of endemism. PIPA is not only outstanding in its reef fish biodiversity but is outstanding for the extraordinary abundance and size of fish, indicative of the high habitat quality and level of protection.

Many fish species in PIPA are seen in exceptional sizes and occur in much higher densities than occur in many other localities in the Indo-Pacific region, noteworthy species including surgeonfishes (Holocentridae), *Eviota* (Gobiidae), and *Trimma* (Gobiidae) (*Acanthurus guttatus, A. nigricans, A. triostegus, A. xanthopterus, Naso literatus,* and *Zebrasoma veliferum*) and parrotfishes (*Hipposcarus longiceps* and *Scarus ghobban*) further testimony to their general lack of exploitation and habitat quality occasioned by remoteness and formal protection. All of these species can be readily sighted in extraordinarily large aggregations in PIPA. Especially noteworthy are the huge spawning aggregations of longnose parrotfish (*Hipposcarus longiceps)* found at Kanton and large shoals (>200) of the threatened Bumphead Parrotfish (*Bulbometopon muricatum*) (VU) seen on most dives at Orona, both in the lagoon and on outer reefs (Allen and Bailey). The lagoon at Orona is also notable for its population of juvenile Napoleon Wrasse (*Cheilinus undulatus*) (EN) thus providing a safe breeding area for this globally endangered species. Overall, the Phoenix Islands population of Napoleon Wrasse (*Cheilinus undulatus),* usually a good indicator of absence of local fishing pressure, is exceptional compared to other internationally recognized marine hotspots recently surveyed in the Indo-Pacific region by CI.

PIPA hosts a large proportion of regional (Central Pacific) and local endemic species, species new to science (Allen and Bailey), and unusual species assemblages. Spectacular mass spawnings by parrotfish and wrasse species have been observed and documented within PIPA. PIPA may also host spawning grounds for the commercially important skipjack tuna. The near-pristine coral reefs provide important protected habitat for populations of higher predators such as sharks.

Recent observations show that PIPA reefs are highly vulnerable to iron enrichment from shipwrecks, which can cause widespread mortality of corals and conversion to an algae-dominated state. Better understanding of this risk will be useful for managing impacts locally.

Currently, the only domestic reef fisheries are associated with subsistence fishing on Kanton Atoll in connection with the administrative settlement on Kanton. This level of harvests is

minimal and will be analyzed further and managed through the Kanton Sustainable Resource Use Plan [cite]. There are no other domestic commercial fisheries on PIPA reef resources, although there are currently no license limitations on such fisheries in current domestic commercial licenses. License conditions prohibiting commercial fishing in the PIPA will be developed and added to commercial licenses as they are re-newed.

2010-2014 Actions:

- *Full protection of coral reefs and coastal habitats and associated species will continue to be implemented around 7 of the 8 PIPA Atoll and Reef Islands out to 12 nautical miles.*
- *The Kanton Atoll Sustainable Livelihoods/Conservation and Sustainable Resource Use plan will be take into consideration in its development and implementation maximizing effective conservation of Kanton's coral reefs, coastal habitats and associated species out to 12 nautical miles whilst ensuring that the subsistence needs of the local Kanton Atoll caretaker population are met.*
- *Recovery from previous unsustainable practices, e.g., shark finning, and meteorological impacts, e.g., coral bleaching, will be monitored and related recommendations for improving management from other SAPs eg Climate Change, Endangered and Threatened Species programmes will be made.*
- *License conditions prohibiting domestic commercial fishing on the PIPA coral reefs will be developed and included in all domestic commercial fishing licenses.*

SAP 2.3 PIPA Endangered and Threatened Species

Target: by the end of 2014, effective PIPA Endangered and Threatened Species conservation will be fully integrated into the management of PIPA. Further the PIPA Monitoring and Evaluation Programme will enable detection of trends in these species and the threats facing them in order to improve management interventions designed to improve their conservation status.

Baseline situation:

Protected Species have been prescribed by the Wildlife Conservation Ordinance 1975. The current situation with regard to species protection in the Phoenix Islands is presented below drawn from existing laws and regulations and measures agreed in PIPA's interim management. The current IUCN Red List for Kiribati/PIPA is given in Appendix 6.

Birds -. In Schedule 1 of the Wildlife Conservation Ordinance, fully protected birds are listed below:

Local Name	**English Name**	**Scientific Name**
1. Te Eitei, Katafa	Great Frigatebird	*Fregata minor*
2. Te Eitei	Lesser Frigatebird	*Fregata ariel*
3. Te Taake	Red-tailed Tropicbird	*Phaethon rubiricauda*
4. Te Ngutu	White-tailed Tropicbird	*Phaethon lepturus*
5. Te Mouakena	Masked or Blue-faced Booby	*Sula dactylatra*
6. Te Kibui	Brown Booby	*Sula leucogaster*
7. Te Kota, Makitaba	Red-footed Booby	*Sula sula*
8. Te Korobaro	Wedge-tailed Shearwater	*Puffinua pacificus*
9. Te Tinebu	Christmas Island Shearwater	*Puffinus nativitatis*

10. Te Nna	Audubon's Shearwater	*Puffinus lherminieri*
11. Te Tangiuoua, Ruru	Phoenix Petrel	*Pterodroma alba*
12. -	Bulwer's Petrel	*Bulweria bulwerii*
13. Te Bwebwe ni marawa	White-throated Storm-Petrel	*Nesofregata albigularis.*
14. Te Tiriwenei	Pintail Duck	*Anas acuta*
15. Te Kaai	Reef Heron	*Demigretta sacra*
16. Te Mangkiri, Takiri	Black or White-capped Noddy	*Anous tenuirostris*
17. Te Kunei, Io	Brown or Common Noddy	*Anous stolidus*
18. Te Raurau	Blue-grey Noddy	*Procelsterna caerulea*
19. Te Tarariki, Kereekere	Sooty Tern	*Sterna fuscata*
20. Te Tarangongo	Grey-backed Tern	*Sterna lunata*
21. Te Kiakia	Black-naped Tern	*Sterna sumatrana*
22. Te Karakara	Crested Tern	*Thalasseus bergii*
23. Te Matawa	White or Fairy Tern	*Gygis alba*
24. Te Kun	Pacific Golden Plover	*Pluvialis fulva*
25. Te Kitiba, Kolili	Rudy Turnstone	*Arenaria interpres*
26. Te Kewe	Bristle-thighed Curlew	*Numenius tahitiensis*
27. Te Kiriri	Wandering Tattler	*Heteroscelus incanus*
28. Te Kaka	Bar-tailed Godwit	*Limosa lapponica*

Corals – over 1/3 of scleractinian corals are listed as Threatened on the IUCN Red List, and all species are vulnerable to climate change due to rising temperatures and acidification. Actions under SAP 2.2 will include species-related measures to maximize their protection.

Turtles – Previously under the Wildlife Conservation Ordinance, green turtles - their eggs and nests, were protected in most of the Phoenix Islands, excluding Kanton and Enderbury According to Pulea and Farrier (1993), the green turtle was fully protected in the following designated areas: Birnie, Nikumaroro (Gardner), Orona (Orana, Hull), McKean, Rawaki (Phoenix), and Manra (Sydney). Prohibited acts included: (1) hunting, killing or capturing, (2) possession of any part, (3) searching for, taking, or wilfully destroying or damaging eggs and nests, and (4) possession, acquiring, selling or giving eggs or nests. Pulea and Farrier (1993) note that green turtles were protected on certain Phoenix Islands, but were not protected at sea. Other marine turtles were protected on land by Section 7 of the Wildlife Conservation Ordinance (Pulea and Farrier 1993). Hunting, capture, and killing other marine turtles while on land were prohibited without a permit. However, like the green turtle, they were not protected at sea.

Under this Plan all turtle species are fully protected throughout PIPA except for current take for subsistence purposes by the local Kanton caretaker population for turtle harvest from Kanton Atoll only. As part of the development of the Kanton Atoll Sustainable Resource Use Plan the sustainability of this take will be assessed and measures taken accordingly.

Tuna – Under Kiribati's Fisheries law a 60 nautical mile purse seine exclusion zone applies around Kanton Atoll. Additionally all DWFN effort is banned in a 12 nautical mile zone around each of the Phoenix Islands atolls. Further under recent subregional arrangements (Nauru Agreement) Kiribati has agreed to ban the use of FADs for fishing for 3 months (July to September) for all DWFN and instituted a mandatory 100% observer coverage. These and related measures are now in force under the 3rd Arrangement under the Nauru Agreement and are being progressively phased in as DWFN licenses (largely annual except for USA purse seiners) expire and are re-issued.

Under this Plan the above measures for tuna conservation management will be extended through the proposed additional 25% no take zone coverage consistent with the capitalization of the PIPA Conservation Trust and compensation for lost revenues. This no-take zone will apply to all DWFN fleets except the USA fleet until the US Fisheries Multilateral Treaty (USFMT) expires in 2013.

Bonefish – Under the Fisheries Ordinance, the catching of bone fish in the PIPA was strictly regulated in 2005, restrictions include method (gear type) and amount of catch, catch and release and fees for tourism fishing.

Other terrestrial and marine biota – it is important to recognise that under the current or baseline PIPA Zonation all biota, terrestrial and marine, is fully protected in and out to 12 nautical miles for seven of the eight PIPA atolls/ reef islands. This is a key measure for terrestrial and coastal biota and immediate offshore areas due to the paucity of status information for most endangered and threatened species, including locally important and endemic species, in PIPA and indeed in Kiribati. For Kanton Atoll the conservation needs of endangered and threatened species will be a key consideration in the proposed Kanton Atoll Conservation and Sustainable Resource Use Plan.

One key gap identified in protected species coverage is the conservation needs of cetaceans, and several migrant seabirds travelling through the area (Pierce et al 2008)..

2010-2014 Actions:

- *Drawing from the current protected species measures, gaps identified in protected species coverage from the IUCN Red List for PIPA and species identified as locally important, e.g., native medicinal plants and endemics, a revised Protected Species List for PIPA will be developed and appendixed to this Plan by the end of 2010.*
- *This current Protected Species List and its further development outlined above will be used to inform the development PIPA Monitoring and Evaluation Plan to ensure its usefulness to assess information needs eg threat and species status trends for improved management of endangered and threatened species protected in PIPA.*
- *The contribution of PIPA to maintaining populations of the above species and how this may help protecting/restoring and where appropriate using these species in the Gilbert and Lines island groups will be identified and built into national programmes for protecting and using threatened species.*

SAP 2.4 PIPA Offshore Fisheries

Target: by the end of 2014 PIPA's Offshore (tuna) Fishing effort will be reduced by 25% on an area closure basis through increased no take zonation commensurate with compensation from the PIPA Conservatipon Trust, as set forth in the PIPA Conservation Contract. Impacts of this decision will be monitored and understood through monitoring of landing catch and fishing effort data. Currently this excludes fishing effort and revenues from the USFMT as the current treaty arrangements do not expire until end 2013. Research will be identified to further clarify tuna spawning hot spots and special management zones within the PIPA.

Baseline Situation:

Offshore fishing by DWFN is currently allowed under license except in the 60 nautical mile purse seine exclusion zone surrounding Kanton Atoll and in the 12 nautical mile no take

zones surrounding the eight PIPA islands. PIPA is the world's first MPA to be used in part as a contribution to tuna conservation management and it's compatible with wider regional tuna and DWFN operational decisions that Kiribati is part of, e.g., 3rd Arrangement of the Parties to the Nauru Agreement. Additionally the basis of lost DWFN license fees is a principal component of the PIPA Conservation Trust construct. It is thus important over time to understand more fully the nature of the fishing currently allowed in PIPA, the impact of no-take or exclusion zones and the contribution of area-based closures to tuna conservation management.

In endowment discussions with GoK, catch and revenue estimations have had to rely on a relatively short time-series of data. Consequently, analysis of fishery license revenues hinges on a number of assumptions that cannot be verified or disproved without additional, more precise data. For instance, an important assumption in calculating potential reductions in DWFN revenues associated with the establishment of a tuna "no-take" zone within the PIPA relates to the spatial distribution of the annual DWFN catch and the harvest implications of spatially constraining the DWFN fleet in PIPA waters. Uwate et al. (2008) assumed that catch is evenly distributed throughout the Phoenix Islands EEZ. However, it is not clear to what degree foregoing harvests in all or part of PIPA will affect total DWFN landings in the Phoenix Islands EEZ. In addition, it is not clear whether a reduction in catch from the PIPA area results in an equivalent reduction in total catch (from open areas in the Phoenix Islands EEZ as well as DWFN operations in the rest of the Kiribati EEZ), because some or all of the catch and fishing effort that historically took place in potentially closed areas of the PIPA would be displaced to different areas. Indeed, the net effect of some MPAs has been to increase catches in adjacent areas, in what has been termed the "spillover effect." Skipjack tuna juveniles have been collected in the Phoenix Islands area, suggesting that skipjack tuna may spawn in that area. If the Phoenix Islands are a major tuna spawning area, then there may be positive spillover effects in adjacent waters of PIPA, actually enhancing catches in the EEZ areas that remain open to fishing. This dynamic could have significant implications for the impact of the PIPA zonation scheme on net DWFN revenues, and thus on the scope of the no-take zone that could be supported at any set level of the PIPA Conservation Trust..

Apart from tuna fisheries (long line and purse seine), no other offshore fisheries are operating in PIPA waters. Measures to sustainably manage and protect other offshore resources of PIPA must be developed and integrated with programmes for fisheries development and negotiations with DWFN. In particular, fishing methods that destroy habitat must be excluded. See SAP 2.6 on Seamounts.

2010-2014 Actions:

- *Early agreement by GoK and partners as part of the PIPA monitoring programme on which parameters are to be measured to understand fishing effort (catch landings, license revenues) and their relationship to PIPA management and no take fishing zonation. Implementation of this part of the monitoring programme is a high priority to inform the further development and use of the Conservation Contract with thePIPA Conservation Trust.*
- *Expanded tuna no-take zones will be identified and implemented through limitations on annual DWFN fleet licenses as necessary to comply with the terms of the Conservation Contract executed between the GoK and the PIPA Conservation Trust.*

- *Early discussions with the U.S. will be undertaken in advance of the re-negotiation of the U.S. MFT to access the potential impacts of various PIPA zonation approaches on potential U.S. MFT revenues.*

SAP 2.5 PIPA Cultural and Historical Heritage
Target: by the end of 2014 a conservation and information programme for PIPA's cultural and historical heritage programme will be designed and implemented under the direction of the Kiribati Museum and Cultural Centre in partnership with the MELAD PIPA Office.

Baseline Situation:
The Phoenix Islands have a rich and diverse cultural and historical record with the common element of human occupation reaching its limits. PIPA cultural and historical values identified include:

- Archaeological artifacts, including walled structures, are evidence of early colonization by both Micronesians and Polynesians, providing an important cultural link and an example of island voyaging over time and the limits to which human settlement can extend – even into modern times. The Phoenix Islands could be considered an overlap area of these two important Pacific Islands peoples.
- The island Nikumaroro was named by Gilbertese settlers in 1937 in honour of the island of Nikumaroro, in the south of the Gilbert Group, from which the famous Gilbertese ancestress Nei Manganibuka came, bringing with her the traditional lore of deep-sea navigation and the first *buka* tree.
- Nikumaroro is possibly the site of the crash landing of Amelia Earhardt on her failed trans-Pacific flight in 1938. Remains of a well-documented World War II aircraft crash exist on the island of Manra.
- Several islands in the group hold archaeological remains of settlements, guano mining and whaling/transiting ships from the 19th and early 20th centuries.
- Archaeological remains of the 20th century world beyond the Phoenix Islands and Kiribati borders include British and United States military bases from the Second World War, the airfield markers and base for the Trans-Pacific Pan-Am Clipper seaplane flights of the mid 1940-50s, and the United States missile testing base SAMTEC.

The only active regular historical investigation in the PIPA is the ongoing investigation of the Earhardt crash by the US-based NGO, The International Group for Historic Aircraft Recovery (TIGHAR). TIGHAR operates under a PIPA Research Permit and has provided all reports to the PIPA Office.

2010-2014 Actions:

- *Development and implementation of a Cultural and Historical Heritage Conservation Programme for PIPA under the auspices of the Kiribati Museum and Cultural Centre.*
- *Development of an information programme on the cultural and historical heritage of the Phoenix Islands, including information useful for tourism development.*
- *Ongoing TIGHAR investigation into the Earhardt disappearance under a PIPA permit and with TIGHAR resources, noting that if clear evidence was found this would be of international importance.*

SAP 2.6 PIPA Seamount & Deep Seas

Target: by the end of 2014, increased understanding and conservation of PIPA seamount and deep sea habitat will be fostered through targeted research, a proposed seamount naming campaign and increased representative habitat protection in the Phase 2 Zonation no-take zones.

Baseline Situation:
A globally unique aspect of the PIPA is the ocean-scape scale of the management area. PIPA has a huge bathymetric range with waters reaching to maximum of 6,147 meters depth but the main seafloor averages around 4,500 metres below the ocean surface. Additional to the ancient volcanoes that reach or approach the surface, bathymetry reveals a series of topographic features which are interpreted to also be volcanoes and which technically qualify as 'seamounts' – 'submerged mountains with a height of more than 1,000 metres above the sea floor but whose peak lies below the photic zone'. To date, some 14 seamounts have been identified within PIPA, thirteen of which have been formally registered but only nine of those have yet been named: Tai, Polo, Siapo, Gardner, Tanoa, Fautasi, Tau Tau, Carondelet and Winslow Reef (see Annex 3 for Seamount Summary Descriptions).

Seamounts are known to have a high level of endemism and often contain high numbers of species that are new to science. Seamount ecosystems are of very special interest for conservation. Seamounts are particularly vulnerable to serious impact and local extinctions as a consequence of concentrated commercial fishing. It is estimated that as much as 25% of the world's seamount ecosystems have already been degraded by deep sea fishing. Kiribati has recognised threats to seamounts and deep sea habitat in its signature of the *Declaration on Deep-Sea Bottom Trawling to Protect Biodiversity in the High Seas (Nadi Communiqué, Pacific Islands Forum, October 2006).* This agreement commits the members of the Pacific Islands Forum to urgently take actions consistent with international law to prevent destructive fishing practices on seamounts in the Western Tropical Pacific Islands Area. Protection of seamounts and deep sea habitat within PIPA is a complementary domestic measure to conserve these habitats within Kiribati's EEZ.

PIPA is fortunate in being so remote and its seamounts are so deep that the PIPA seamounts have escaped deep sea trawling to date. Consequently, their biota is believed to be intact and so, with continued protection, remain a valuable conservation asset. PIPA is one of the very few large marine protected areas in the world that contains numerous seamounts, and the only one in the tropics. The 2000 deep-sea surveys by NEAq recorded the first distribution records of sixgill (*Hexanchus griseus)* and Pacific sleeper (*Somniosus pacificus*) sharks for this part of the Pacific from 900 meters depth near Kanton. It is probable that the seamounts of PIPA have great importance for pelagic and commercially important fishery such as tuna and skipjack. With 25% of the world's seamounts already degraded, the pristine seamounts of PIPA provide critically important protection for these fragile ecosystems and associated species, representing a conservation resource of global significance.

PIPA's seamounts and deep sea habitats are seen as an important yet little understood component of PIPA. Targeted action during this plan seeks to address their effective protection and increase research effort and understanding as resources allow.

2010-2014 Actions:

- *Maximise and incorporate protection of the Winslow and Carondelet Reef Seamount systems in PIPA Phase 2 Zonation.*

- *Adjustments to the PIPA zoning plan of the open ocean/buffer zone to specify protection levels for seamounts.*
- *Investigation into naming rights of seamounts with the view to renaming with I-Kiribati names those named already and 'auctioning' naming rights as part of the PIPA awareness and fund raising programme.*
- *Develop and support a seamount and deep sea research programme within PIPA with the following aims:*
    - *To describe the biodiversity and habitats of the deeper areas of the PIPA;*
    - *To explore potential links between deep and shallow habitats of the PIPA;*
    - *To use this biological data from the deep areas of the PIPA to inform the PIPA Management Planning process.*
    - *To document lessons learnt in the PIPA development as the first MMA model in the Pacific Islands region and the first for a Small Island Developing State (SID) that is inclusive of deep sea habitat.*

SAP 2.7 PIPA Climate Change

Target: by the end of 2014, best practice measures for climate change adaptation in tropical marine protected areas will be investigated and implemented, as resources allow for PIPA Further a PIPA Climate Change Research Programme will be designed and promoted using PIPA as a globally important sentinel site in understanding the impacts of climate change on tropical marine and island atoll systems in the virtual absence of other anthropogenic factors.

Baseline situation:
Climate change is considered the most significant environmental risk to Kiribati as a nation and this includes significant potential risk to the development and integrity of the PIPA. Kiribati and associated partners and donors have invested significantly into understanding and planning for climate change and this is reflected in the World Bank Kiribati Adaptation Programme 2nd phase (KAP2).

In 2002-3, the Phoenix Islands experienced a bleaching event as a result of increased sea surface temperatures that reached 21 Degree Heating Weeks and persisted for several years. Inside the lagoon of Kanton the luxuriant community of *Acropora spp.* corals suffered near 100% mortality and there was an estimated 60% mortality of corals throughout the island group, as measured in 2004 and 2005. Fish populations were not noticeably affected. By 2009 the Phoenix coral reefs have shown spectacular and rapid signs of recovery, regaining 50% of the area lost, and nearly 100% recovery in the best sites

The Phoenix Islands' example of mortality from a global event then recovery in the absence of significant local human impacts is significant as a reference case globally. With good water quality and intact fish herbivore populations, the initial colonization by algae following the coral mortality followed a succession from turf algae to coralline algae, and a progressive recovery of corals which are promoted by coralline algal cover. Also, the deep atoll slopes allowed deeper water corals to survive the bleaching event, species of fish remained robust, and there were signs of regeneration on even the most badly hit reefs shortly after the bleaching occurred. That is taken to be a positive sign and suggests both the resilience of the Phoenix Islands reefs to global climate change and the value of these remote island reefs as global benchmarks. Impacts of the warming in 2002-3 to other components of the Phoenix

Islands flora and fauna were not studied, but their remoteness will make them as valuable examples as global benchmarks for these systems as well.

The effects of global climate change and global warming are expected to be experienced even in the remote areas such as PIPA. In fact PIPA is located in the part of the Central Pacific from which warm surface waters that drive the El Niño phenomenon originate. There have been various meteorological studies that suggested that the Phoenix Islands region is ideally placed for monitoring changes in weather patterns, especially ENSO activities in the central Pacific. The impacts of these changes could be amplified in the frail and unique ecosystems of the Phoenix Islands. Rising sea levels could submerge these atolls (though individual islands may be rising tectonically) and warming sea surface temperatures can result in coral bleaching.

The meteorological conditions also have a big influence on fish stocks in the region. Lehodey et al (1997) examined the ENSO in relationship to the western equatorial Pacific warm pool. During ENSO events this warm water pool shifts to the east and skipjack tuna populations also shift to the east extending significant catches to the Phoenix Islands. The Phoenix Islands region appears to be the centre of El Niño activities in the Pacific so may be ideal for studying the El Niño phenomenon and more generally in relation to climate change.

Even though coral reefs of the Phoenix Islands are not isolated from the effects of global warming such as bleaching, their ability to regenerate appears much better than reefs in more populated areas in part because of lack of other threats and stresses to the reefs and possibly because they have adapted to the variations in water temperature caused by ENSO phenomena over a long period of time. This provides an important and likely unsurpassed opportunity to research and understand climate change impacts on coral reef systems in the virtual absence of other anthropogenic factors.

With respect to the direct PIPA management implications of climate change, there is an increasing body of literature and best practice advice for both marine and terrestrial protected area design, planning and implementation to best adapt to impacts of climate change. Drawing on this information a PIPA Climate Change Vulnerability Assessment was resourced with CI funding in 2009 and results will be incorporated into this Plan's implementation. It is noted that to date the most successful basic management strategy is to remove all other anthropogenic stressors to the PIPA environment, e.g., reduce fishing effort, avoid pollution, and eradicate invasive species, on the basis that PIPA would then have the best chance to cope with impacts of climate change.

In summary, PIPA will be managed in accordance with best practice advice and information for adaptation to climate change in marine and island protected areas. PIPA, as a very remote, intact, protected oceanic environment, is of scientific importance as a global benchmark for identifying and monitoring the processes of sea level change, growth rates and age of reefs and reef builders, both geologically and historically, and in evaluating effects from climate change and coral bleaching events without the confounding factors of pollution or resource extraction. The reef system is so remote from industrial activities that it can serve as a critical benchmark for coral ecosystem understanding and potential guide the restoration of other degraded hard coral ecosystems. The atolls and associated reef systems are acknowledged as critical sites for ongoing study of:

- global climate change, ocean acidification and sea-level events in that they are located in a region less affected by other anthropogenic stresses;

- growth of reefs, evolution of reef systems, biological behavioural studies, recruitment processes in isolation, size classes and population dynamics of all marine organism groups and reef species diversity studies.

As such, the PIPA has exceptional value as a natural laboratory for the study and understanding of the significant ongoing ecological and biological processes in the evolution and development of marine ecosystems of the Pacific, the world's largest ocean, indeed all oceans.

2010-2014 Actions:

- *By March 2010 a PIPA Climate Change Scoping Study will be completed and based on this specific advice and input to this Plan (via annual Operational and Business Plans) on climate change issues will be made to ensure that PIPA management is consistent with best practice for climate change resilience and adaptation for protected areas.*
- *By March 2010 linkages between PIPA and the Kiribati National Adaptation Strategy under the National Adaptation Steering Committee in the Office of Te Beretitenti the Kiribati Adaptation Programme (KAP2) and the Climate Change Unit of the ECD will be established for reporting, policy linkages and implementation of this Plan and its Operational and Business Plans.*
- *By March 2011 assessment and development of PIPA as a 'natural climate change resource laboratory' will be made based on PIPA's attributes as being a large, remote, all marine habitat inclusive MPA that has limited other anthropogenic impacts and as such clearly articulates national, regional and global potential benefits. As part of this PIPA will explore and outline potential partnerships eg through its sister agreement with the North-west Hawaiian Marine National Monument (USA) and with international reef protection organizations, to better understand and capitalize on PIPA's apparent climate resilience (e.g., rapid recovery from bleaching events caused by increases in sea surface temperature). This is seen as a key investment strategy for PIPA to help with needed research, monitoring and management costs.*

SAP 3. State of PIPA Report 2014

Under the auspices of the MELAD Minister and the Principal Environment Officer the PIPA Office will produce, not later than 1 July 2014, a "State of the PIPA" report as required by the PIPA Regulations (2008). This report will assess PIPA status and trends including:

- Bird population trends
- vegetation/ecosystem responses
- Live coral cover trends
- Selected reef fish population trends
- Reef shark population trends
- Turtle population trends
- Pelagic conditions within the PIPA, including fisheries landings trends
- Annual visitor number trends and
- Such other matters as the PIPA MC shall chose to report

The design of the PIPA Monitoring and Evaluation Programme will be completed by the end of June 2010 to ensure consistent and standard methodology to monitor the parameters listed above. At that time a PIPA Baseline Report for these parameters based on existing information will be compiled to be used as a reference base for the evaluation of trends for the 2014 report.

This report will be used as a basis for evaluation of the effectiveness of PIPA Management to date, issues arising and will provide input to a new PIPA Management Plan to be effective from 1 January 2015.

SUMMARY: For this Plan (PIPA Management Plan (2010-2014)) the PIPA Office will lead the development and completion for the Principal Environment Officer and MELAD Minister approval of a "State of the PIPA " report to be completed not later than 1 July 2014.

APPENDICES

9. **Glossary of Terms**
10. **PIPA Regulations (2008)**
11. **PIPA Seamount Summaries**
12. **PIPA Island Summaries**
13. **IUCN Red List – Kiribati/PIPA**
14. **PIPA Permits**
15. **PIPA Species List**

REFERENCES CITED

Allain, V. 2006. Seamounts and pelagic fisheries interactions under study. SPC fisheries newsletter #116 – January/March 2006. Pp. 33-35.

Atherton, J. 2006 CEPF Ecosystem Profile for the Polynesia/Micronesia Hotspot

Division of Ocean Affairs and the Law of the Sea Office of Legal Affairs (DOALOS). 2007. Development, implementation and management of marine protected areas training manual (draft). Train-Sea-Coast Workshop, Honiara, Solomon Islands. 15-20 January 2007. United Nations, New York.

Chapman, L. 2004. Nearshore domestic fisheries development in Pacific island countries and territories. 4th SPC Heads of Fisheries Meeting, 30 August-3 September 2004, Noumea, New Caledonia. Information Paper 8.

Conservation International. 2006. Technologies for tracking & combating illegal fishing. Power point presentation prepared by the Regional Analysis Program, Center for Applied Bioidiversity Science, Conservation International. 20 slides.

Garnett, M.C. 1983a. A management plan for nature conservation in the Line and Phoenix Islands. Part 1. Description. Unpublished report prepared for the Ministry of Line and Phoenix Islands, Kiritimati Island, Kiribati. 318 pp.

Garnett, M.C. 1983b. A management plan for nature conservation in the Line and Phoenix Islands. Part 2. Policy. Unpublished report prepared for the Ministry of Line and Phoenix Islands, Kiritimati Island, Kiribati.

Garnett, M.C. 1983c. Part 3. Recommendations. Unpublished report prepared for the Ministry of Line and Phoenix Islands, Kiritimati Island, Kiribati. 125 pp.

Government of Kiribati/MELAD 2009 . Phoenix Islands Protected Area. Nomination Dossier to the UNESCO World Heritage Convention.

Hampton, J., T. Lawson, P. Williams, and J. Sibert. 1995. Interaction between small-scale fisheries in Kiribati and the industrial purse seine fishery in the western and central Pacific Ocean. In: R.S. Shomura, J. Majkowski, and R. Harman (eds). Proceedings of the Second FAO Expert Consultation on Interactions of Pacific Tuna Fisheries. Shimizu, Japan. 23 to 31 January 1995. FAO Fisheries Technical Paper T365.

IUCN. 1994. Guidelines for protected area management categories. IUCN Commission on National Parks and Protected Areas with assistance of WCMC. IUCN, Gland, Switzerland and Cambridge, UK.

IUCN. 2006. The ecosystem approach: demystifying the concept and its application in the Marine Environment. 7th meeting of the United Nations. Open-ended Informal Consultative Process on Oceans and the Law of the Sea, New York, New York, June 12-16, 2006.

IUCN Protected Areas Programme. Draft. Management planning for World Heritage properties, a resource manual for practitioners. World Commission on Protected Areas, World Heritage, and UNESCO. [draft report 2007].

Langley, A. 2003. Kiribati national tuna fishery status report no. 2. Oceanic Fisheries Programme, Secretariat of the Pacific Community.

Kelleher, G. (ed.). 1999. Guidelines for marine protected areas. World Commission on Protected Areas of IUCN. Best Practice Protected Area Guidelines Series No. 3. IUCN – The World Conservation Union.

New England Aquarium. 2006. Pacific islands paradise protected. News release, Newswide, March 28, 2006.

Pierce, R.J., T. Etei, V. Kerr, E. Saul, A. Teatata, M. Thorsen, and G. Wragg. 2006. Phoenix Islands conservation survey and assessment of restoration feasibility: Kiribati. Report prepared for: Conservation International, Samoa and Pacific Islands Initiative, Auckland University, Auckland.

Pollution Control Unit. 2006. Report on Kanton chemical cleanup mission (19/5/06 - /05/06). Environment and Conservation Division.

Salafsky, N., R. Margoluis, and K. Redford. Undated. Adaptive management: a tool for conservation practitioners. Washington, D.C.: Biodiversity Support Program.

Stone, GS, Obura, DO & Rotjan, RD. 2009. Phoenix Islands Protected Area Expedition 2009 – Assessment Report. New England Aquarium, PIPA, Conservation International

Uwate, K.R. and T. Teroroko. 2007a. Compilation of reports related to the Phoenix Islands. Phoenix Islands Protected Area, Ministry of Environment, Lands and Agricultural Development, Government of Kiribati, Bikenibeu, Tarawa, Republic of Kiribati. PIPA Technical Report No. 1.

Uwate, K.R. and T. Teroroko. 2007b. Phoenix Islands Protected Area – Stakeholder opinions. Phoenix Islands Protected Area, Ministry of Environment, Lands and Agricultural Development, Government of Kiribati, Bikenibeu, Tarawa, Republic of Kiribati. PIPA Technical Report No. 2.

Uwate, K.R., W. FitzGerald, and T. Teroroko. 2007. Valuation of Phoenix Islands marine and fisheries resources. Phoenix Islands Protected Area, Ministry of Environment, Lands and Agricultural Development, Government of Kiribati, Bikenibeu, Tarawa, Republic of Kiribati. PIPA Technical Report No. 3.

World Heritage Centre (WHC). 2005. Operational Guidelines for the implementation of the World Heritage Convention. United Nations Educational, Scientific and Cultural Organisation, Intergovernmental Committee for the Protection of the World Cultural and Natural Heritage. WHC 05/2, 2 February 2005.