

# South-East Pacific Region

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# 1 About

## 1.1 Overview

The South-East Pacific region spans the entire length of the Pacific coast of South America from Panama to Cape Horn, encompassing tropical, sub-tropical, temperate and subantarctic systems. In spite of this astounding diversity, the region's five countries (Chile, Peru, Ecuador, Colombia and Panama) find themselves united by two overwhelming natural phenomena known as Large Marine Ecosystems: that dominated by the cold, nutrient-rich Humboldt Current; with the largest upwelling system in the world supporting one of the world's most productive fishing grounds; and that of the Eastern Equatorial Pacific. However, the region is under threat from coastal and marine degradation by land-based and marine-based sources of pollution; the destruction of critical habitats and loss of species; and overexploitation of the regions natural resources.

In order to protect the rich marine and coastal environment of the region, the South-East Pacific Action Plan was adopted in 1981 together with the Convention for the Protection of the Marine Environment and Coastal Zones of the South-East Pacific (Lima Convention) and its associated protocols: 1) Agreement on Regional Cooperation in Combating Pollution in the South East Pacific by Hydrocarbons and other Harmful Substances in cases of Emergency; 2) Protocol for the Protection of the South East Pacific Against Pollution from Land- Based Sources; 3) Protocol for the Conservation and Management of Protected Marine and Coastal Areas of the South East Pacific; 4) Protocol for the Protection of the South East Pacific from Radioactive Pollution. The Action Plan is implemented within the framework of inter-agency cooperation between the Permanent Commission for the South Pacific (CPPS), UNEP and some two dozen agencies, programmes and Convention Secretariats.

The future priorities for the region will focus on: the full implementation of existing legal instruments, developing transboundary pollution monitoring and control programmes; the protection of threatened species, including marine mammals and turtles; the prevention of the introduction of alien invasive species; and to pursue a strong programme of public education and awareness.

The region has recently signed a historic agreement with the South Pacific Environment Programme (SPREP), to cooperate in the protection of a more extensive area of the Pacific.

## 1.2 Key Dates

1952	Santiago Declaration on the Maritime Zone and the complementary agreement to the declaration of sovereignty over the 200 nautical mile maritime zone on 18 August. The Permanent Commission for the South Pacific (CPPS) was established on 18 August.
1981	South-East Pacific Action Plan was adopted together with the Convention for the Protection of the Marine Environment and Coastal Zones of the South-East Pacific (Lima Convention) and the Agreement on Regional Cooperation in Combating Pollution in the South East Pacific by Hydrocarbons and other Harmful Substances in cases of Emergency was signed.
1983	Complementary Protocol on the Agreement for Regional Cooperation in Combating Pollution in the South East Pacific by Hydrocarbons and other Harmful Substances in Cases of Emergency and the Protocol for the Protection of the South East Pacific Against Pollution from Land- Based Sources was signed
1986	Lima Convention entered into force.
1989	Protocol for the Conservation and Management of Protected Marine and Coastal Areas of the South East Pacific and the Protocol for the Protection of the South East Pacific from Radioactive Pollution was signed.
1994	Protocol for the Protection of the South East Pacific from Radioactive Pollution entered into force.
2000	The text of the Framework Agreement for the Conservation of Living Marine Resources in the High Seas of the Southeast Pacific (Galapagos Agreement) was adopted by the delegation of the four Member States at the XXIV Ordinary Meeting of the CPPS, held from 14-18 February.
2002	Santiago Declaration 14 August 2002

## 1.3 Geographic and General Information

**Region:** South-East Pacific

**Participating States:** Chile, Colombia, Ecuador and Peru (N.B. Panama supports and participates in the Action Plan (UNEP 2001))

**Total Population:**

**Length of Coastline:** 16,000 km

**Large Marine Ecosystems:** LME #13: Humboldt Current; LME #11: Pacific Central American Coastal

**GIWA Region:** Subregion 64: Humboldt Current; Subregion 65: Eastern Equatorial Pacific

### 1.3.1 Oceanographic Information

In the south of the region the cold and nutrient-rich waters of the Antarctic Circumpolar Current approach the southern tip of the South American continent from the west at around 50-S and branch to the north and south. The northerly section splits into two arms: the coastal Humboldt Current (Peru Coastal Current) and the

Peru Oceanic Current. These two are separated by the warm, southward-flowing Peru/Chile Counter Current (Hurtado 1995).

The Humbolt Current is cold and rich in nutrients and it is characterized by numerous gyres that are the source of distinctive, local countercurrents and upwelling. At around 6°S the Humbolt Current merges with warm southward flowing waters to become the westward-flowing South Equatorial Current (SEC) (Hurtado 1995).

The SEC is supplemented by waters deflected to the south from the subsurface Cromwell Current that flows along the equator in a easterly direction at a depth of between 100-400 m, although it occasionally rises to the surface. The Galápagos Archipelago deflects this current to the north and south and causes upwelling of deeper and nutrient-rich water around the islands (Hurtado 1995).

In the north of the region the warm North Equatorial Counter Current penetrates the region at around 4+10-N. It splits to the north and south off the coast of Costa Rica, with an anticyclonic eddy forming to the north and a cyclonic eddy forming to the south off the coast of Panama and Colombia (Hurtado 1995).

Periodically the oceanography of the region is dramatically altered by the El Niño effect, which is caused by large-scale change in the ocean-atmosphere interaction. Warm, easterward-flowing waters from the equator dominate the Humbolt Current causing oceanographic changes: seawater temperature rises by 2-3°C, sea level rises by 40-50 cm, and levels of nutrients available in the surface waters are reduced (Hurtado 1995).

### **1.3.2 Coastal Geography**

The Pacific coast of Central America is characterized by numerous peninsulas, gulfs and bays. There are extensive intertidal areas and well-developed coastal barriers and lagoons. Short rivers discharge significant volumes of freshwater and suspended sediment during the rainy season from May to September. Continental shelves are narrow, in places less than 10 km. Wider shelves are found off the coast of Ecuador (up to 28 km) and in the Gulf of Panama (Hurtado 1995).

The Gulf of Panama forms the eastern half of the Pacific coast of Panama. Water depths range from 50-100 m in the middle of the Gulf. Most of the coast is flat with small river mouths, swamps and mangroves. West of the Panama Canal there are extensive tidal flats. On the eastern coast along the Darien Peninsula, there are predominantly marshes and mangrove swamps. The Gulf of San Miguel, with its many estuaries, divides the region into a narrow northwest segment, the Isthmus of Panama, and a wider mountainous, southeastern segment extending to the Colombian border. Cliffs are partly developed along the coast of Panama (Hurtado 1995).

The Pacific coast of Colombia stretches for 1,392 km. To the north of Cape Corientes the coast is high and mountainous with occasional gorges and fjords. To the south the coast is flat with sandy beaches and mangrove areas and extensive estuaries formed by the discharge of numerous rivers, some of which are of considerable size (San Juan, Patia). Islands are present off the coast, some of which (such as Malpelo and Gorgona) are volcanic in origin while others are associated with the deltas of major rivers (Hurtado 1995).

The coast of Ecuador is 950 km long and is formed by a series of alternating bays and capes. In the north and south, the coast is cliffed and fronted by beaches. Cliffs extend southward to around Santa Elena where the coast is formed by a series of stepped marine terraces. In the south the dominant feature of the coast is the Gulf of Guayaquil, which is an estuarine system with shoreline fringed by dense stands of mangroves and mudflats (Hurtado 1995).

The coast of Peru is arid and extends for 3,080 km. The hyperaridity of the coast limits the contribution of fluvial sediments and the development of beaches. Only a few rivers continuously reach the sea, while others do so on a seasonal basis. The shoreline is cliffed and interspersed with pocket beaches and beaches fronting river mouths. South of Pisco there is little or no coastal plain and the shoreline is primarily formed by towering cliffs or small embayments with narrow beaches. From Pisco north to Chiclayo, there are a number of rivers that reach the sea and contribute to the development of localized coastal plains. Coastal sand dunes reach impressive size along the central portion of the coast. Shoreline displacement is evidenced in many locations of coastal Peru by raised shore platforms and raised beaches (Hurtado 1995).

The northern two-thirds of Chile has characteristics similar to those of Peru. The Andean range comes down to the sea, and the cliffed coast is interrupted by small pocket beaches or alluvial embayments where infrequent streams lead down to the shoreline. Numerous terraces appear along cliffed headlands fronting the foothills. To the south the coastal range comes down to the sea and provides for only modest embayments. Pocket beaches prevail south from Valparaiso to Chiloé. South of the latitude of Puerto Montt the coastal configuration becomes broken, and the coast is strongly influenced by the effects of glaciation with many fjords, islands, and channels (Hurtado 1995).

### **1.3.3 Ecosystem Diversity**

#### **1.3.3.1 Coral Reefs**

Coral reefs are quite abundant in the region. Coral formations have been described off the coasts of El Salvador, Costa Rica, Ecuador, Panama, Colombia, and many of the offshore islands. The northern limit of distribution of coral reefs for the Eastern Pacific lies in the Gulf of California (in the Northeast Pacific Marine Region), with the southern limit at Machalilla on mainland Ecuador and the Galápagos Islands. The Eastern Pacific and the Central Pacific faunas are similar, although the Galápagos fauna exhibits a high degree of endemism. The upwelling of colder water, particularly in the Papagayo area and the Gulf of Panama, inhibit reef development (Hurtado 1995).

The main coral areas of the Pacific coast of Central America are found in the waters off Panama (21 species recorded), south of Azuero Peninsula, and Coiba Island. Reef development continues from the border with Panama along the Colombian coast of South America. Important reef formations are found at Ensenada de Utría, Caleta Tebada and Gorgona and Malpelo Islands (UNEP/IUCN 1988 referred by Hurtado 1995).

Small coral formations are present along the mainland coast of Ecuador (e.g. Machalilla). Corals are also present around the Galápagos Islands with a total of 13 hermatypic species and 32 ahermatypic species recorded. The hermatypic corals of the Galápagos are largely of west Pacific origin; there is 30% endemism among the ahermatypic corals (UNEP/IUCN 1988 referred by Hurtado 1995).

#### **1.3.3.2 Mangrove Forests**

Mangroves are numerous along the sheltered regions of the Pacific coast of Central America. The following species are found within the region: red mangroves (*Rhizophora mangle*, *R. harrisonii*), black mangroves (*Avicennia germinans*, *A. bicolor*, *A. tonduzzi*), seed mangrove (*Pelliciera rhizophorae*), *Connocarpus erectus*, white mangroves (*Laguncularia racemosa*) and cork oaks (*Mora oleifera*, *Mora megistosperma*) (UNEP 1999).

From Cabo Corrientes to Ecuador, mangroves are discontinuous, forming inland, and are separated by sand beaches. Mangroves give way to sandy beaches and dunes along the north coast of Ecuador, but reappear in the Gulf of Guayaquil, where they

become the predominant community, and extend south to Tumbes, Peru. This community is a high mangrove forest (up to 30m), as is found in Colombia (IUCN 1992 referred by Hurtado 1995).

The mangroves of the Pacific coast of Panama mainly consist of communities of red mangroves, black mangroves, white mangroves, cork oaks (*Mora oleifera*), chestnuts (*Montrichardia arborescens*) and seed mangrove (UNEP 1999).

### **1.3.3.3 Open Ocean**

Major upwellings occur in the Gulfs of Papagayo and Panama. These are caused by Atlantic winds that blow seasonally across the mountains, moving surface water offshore, and causing upwelling of deeper, nutrient-rich water. Upwelling also occurs permanently off the coast of Peru and seasonally off the coast of Chile (UNEP/IUCN 1988 referred by Hurtado 1995).

The Peru-Chile Trench lies close to the coast of these countries, extending from south of the Gulf of Guayaquil to around 35-S off the coast of Chile. It has a maximum depth of around 8,000 m. The American Trench extends down the coast of Central America and has a maximum depth of about 6,600 m. (Hurtado 1995).

### **1.3.3.4 Kelp Forests**

An extensive kelp bed is found in the intralittoral fringe from Peru south to Tierra del Fuego. The kelp consists of *Lessonai nigrescens*, *Durvillea antarctica*, *Macrocystis pyrifera*, and *Melanophseal* spp. (Hurtado 1995).

### **1.3.3.5 Other Wetlands**

Competition with mangroves limits the presence of saltmarsh in tropical areas of the region. Saltmarsh does occur as a halophytic community occupying saline soils on the inner edge or within the mangrove formations. However, in most areas on the tropical Pacific coast the large tidal range and long dry season seem to inhibit the development of saltmarsh (Chapman 1977 referred by Hurtado 1995). On the Pacific coasts of Central and South America, tidal marshes are confined to small, disjunct inlets along the mountainous high-energy coast of southern and central Chile. Salt shrubs appear to dominate the small tidal marshes of southern Chile (e.g. along the central coast, *Spartina densiflora*) (Hurtado 1995).

### **1.3.3.6 Beaches, Dunes and Cliffs**

Sandy beaches and dunes are common on the Central American coast. Cliffs are also common feature of this coastline and are interrupted by beaches and occasional permanent or seasonal rivers. Cliffs are partly developed along the coast of Panama and towering cliffs are found along the Peruvian and Chilean and coasts. The Aysen region in southern Chile is strongly influenced by the effects of glaciation and is characterized by numerous fjords, channels, islands and islets. Large sand dunes are found along the central Peruvian coast (Hurtado 1995).

### **1.3.3.7 Islands and Submerged Banks**

There are relatively few islands off the coast of Central America with the exception of those off the coast of Panama. These include the islands of Coiba, Otóque, and the Pearl Islands, the latter an archipelago with four main islands and over 180 smaller islands. There are several islands off the Colombian coast, including some (Malpelo and Gorgona) formed by volcanoes and others associated with the deltas of major rivers (Hurtado 1995). The Malpelo Island in Colombia has some of the most unique flora and fauna (UNEP 1999).

The Galápagos Archipelago consists of 13 major islands and about 70 islets and rocks situated 1,000 km off the coast of Ecuador. The older islands are low and flat or undulating; the majority are younger and volcanic, flanked with lava (UNEP/IUCN 1988 referred by Hurtado 1995).

Juan Fernandez Island lies about 900 km off the coast of Chile while San Felix and San Ambrosio Islands are located about 700 km north of Juan Fernandez. From Puerto Montt south for over 1,500 km, an extensive rocky archipelago lies adjacent to the Chilean coast. The island of Chiloé lies at the northern end of this archipelago (Hurtado 1995).

## 1.3.4 Species Diversity

### 1.3.4.1 Algae

Species of algae that have been identified in the region include: Rhodophytae, Chlorophytae, Phaeophytae and Cyanophytae from the macroalgae. Of which, four species are used for food (*Porphyra columbina*, *Ulva fasciata*, *U. papenfussi* and *Gigartina chamissoi*) and four are used for the production of agar (*Gracilariopsis lemaneiformis*, *Agardhiella tenera*, *Hypnea valentiae*, *Ahnfeltia durvillae*) and four are used for the production of alginates (*Macrocystis pyrifera*, *M. integrifolia*, *Lessonia nigrescens*, *Gigartina chamissoi*). There are also 234 species of microalgae including diatoms, dinoflagellates, coccolithoflorids and phytoflagellates (UNEP 1999).

### 1.3.4.2 Benthos

The sea urchins (*Echinometra vanbrunti*, *Eucidaris thouarsii*, *Tripneustes depressus*, and *Diadema maxicanum*), the starfish (*Tamaria strae*, *Ophicoma aethiops*, *Mitheodia bradleyi*, *Narcissia gracilis*, *Leiaster callipeplus* and *Nidorella armata*) and the basket starfish (*Astrodictyum panamense*) are found on Malpelo Island, Colombia. Also reported are 78 mollusc species associated with coral (*Quoyola monodonta*). Also living at the base of coral are the porcelain snails (*Cyprea albuginosa*, *C. isabellamexicana*, *C. cervinetta*, *C. arabicula*, *C. robertsi*, *C. teres*) and the cones (*Conus didama*, *C. dalli*). In Chile the sea snail (*Concholepas concholepas*) and sea urchin (*Loxechinus albus*) can be found. In the Panama province is much richer in diversity with 971 mollusc species, 400 crustaceans, 61 echinoderms, 300 of marine worms, 5 of salamanders, 11 of chaetognaths, 52 of foraminifera, 1 of brachiopods and 35 Cnidaria (UNEP 1999).

### 1.3.4.3 Fish

The cold, nutrient-rich waters of the Humboldt Current support one of the world's most productive fisheries. More than 16% of the total catch of the Pacific Ocean is caught off the coasts of Colombia, Ecuador, Peru and Chile; the potential sustainable fisheries yield is estimated to be 12.6 million tons annually (Hurtado 1995). The Gulf of Panama is the area with the greatest biological productivity because of the great width of the continental shelf, the seasonal outcrop and the high output of drainage basins. The open sea fish population is dominated by anchovies (*Cetengraulis mysticetus*, *Anchoa spp*, *Engraulis ringens*), herring (*Opisthonema libertate*). Major predators are associated with these species such as the Pacific sierra (*Scomberomorus sierra*), barracuda and sharks. High densities of scad (*Decapterus macrosoma*), sardines (*Etrumeus teres*, *Sardinops sagax*) and jurel (*Trachurus symmetricus*) can also be found (UNEP 1999, Hurtado 1995). Other species of fish found in estuaries, inlets or on the seabed are the butterfish (*Estromateidae*), sea bass, croakers (*Micropogonias altipinnis*), snook (*Centropomus spp.*) and snapper (*Lutjanus spp.*) are common and smaller numbers of tuna fish (albacore, yellow-fin tuna) are found (UNEP 1999).

#### **1.3.4.4 Shellfish**

In Colombia the harvesting of saltwater shrimp is exploited with an area of 39,500 ha. The dominant species are *Penaeus stylirostris* and *Macrobrachium rosenbergii*. Similarly shrimp harvesting is economically important in Chile and Ecuador. The species of penaeid shrimps that are fished are the white shrimp (*Penaeus occidentalis*, *P. stylirostris*, *P. vannamei*), crystal shrimp (*P. brevis*), the carabali shrimp (*Trachypenaeus birdi*) and the Pacific seabob (*Xiphopenaeus reveti*, *X. kroyeri*, *X. precipua*) (UNEP 1999). In addition a large number of deep water shrimp are also fished such as the nylon shrimp (*Heterocarpus vicarius*), colibri shrimp (*Solenocera agassizii*) and the Chilean lobster (*Pleuroncodes planipes*). Other commercially important shellfish include scallops (*Argopecten circularis*), prawns, crabs (*Mithrax spinosissimus*, *Hapalocarcinus marsupialis*, *Lithodes antarctica*), spiny lobster (*Panulirus argus*, *P. guttatus*, *P. laevicauda*) and Juan Fernandez rock lobster (*Jasus frontalis*), clams, oysters and mussels (UNEP 1999, Hurtado 1995).

#### **1.3.4.5 Reptiles**

The lizard (*Phyllodactylus*) is an important species on Malpelo Island, Colombia (UNEP 1999). Four species of marine turtle have been recorded in the region. These are the green (*Chelonia mydas*), the olive Ridley (*Lepidochelys olivacea*), hawksbill (*Eretmochelys imbricata*), and the leatherback (*Dermochelys coriacea*) (UNEP 1999). The green turtle has its main areas of reproduction, feeding and mating in the Galápagos Archipelago. In tropical waters the olive Ridley is abundant, its feeding areas being mainly around the Isla de la Plata off the coast of Ecuador; it nests in this area occasionally. Major nesting sites for this species are found at Nancite and Ostional in Costa Rica. The hawksbill is less common, feeding and nesting in small numbers, along the coast. The leatherback also nests in small numbers but is the least common marine turtle species found in the region ((UNEP/IUCN 1988 referred by Hurtado 1995).

#### **1.3.4.6 Birds**

The Malpelo Island in Colombia has a large nesting colony of boobies (*Sula*) represented by two colonies the masked booby (*Sula dactylatra granti*) and the red footed booby (*Sula sula*). There are also small nesting colonies of frigate birds (*Fregata magnificens*) and tropic birds (*Pterodroma phaeopygea*). Other birds found are the *Pterodroma phaeopygea* and *Puffinus pacificus*. In Chile guano birds and penguins (*Spheniscus humboldti*) are found (UNEP 1999).

#### **1.3.4.7 Marine Mammals**

At least 60 species of marine mammals have been recorded in the region (Hurtado 1995). Over half the world's known species of whales are found in the region. Species of whales found include Blue, Fin, Sei, Humpback, Minke, Bryde's and Sperm whales. Dolphin species found in the region includes Risso's dolphin, bottlenose dolphin, Indo-Pacific humpbacked dolphin, striped dolphin, pan-tropical

spotted dolphin, spinner dolphin, Frazer's dolphin, and Irrawaddy dolphins. The dugong (*Dugong dugong*) is another marine mammal that can be found in the region, however, the dugong is listed as vulnerable to extinction at a global scale by the World Conservation Union (IUCN). In Chile the sea otters (*Mustellidae*, *Lutra provocax* and *L. felina*) and the southern river otter can be found (UNEP 1999).

### 1.3.5 Information on Participating States

#### 1.3.5.1 Chile

**Total Population:** 15,589,000 (HDR 2002)

**GDP (current US\$):** 64,153,380,000 (HDR 2002)

**Maritime Claims:**

territorial sea: 12 NM

continental shelf: 200/350 NM

contiguous zone: 24 NM

exclusive economic zone: 200 NM (CIA 2004)

**Length of Coastline:** 6,435 km (CIA 2004)

**Coastal Protected Areas:**

- Parque Nacional Pan de Azúcar
- Parque Nacional Bosque Fray Jorge
- Parque Nacional Archipelago Juan Fernández
- Parque Nacional Chiloé
- Parque Nacional Laguna San Rafael
- Parque Nacional Bernardo O'Higgins
- Parque Nacional Isla Guanblin
- Parque Nacional Isla Magdalena
- Parque Nacional Alberto de Agostini
- Parque Nacional Cabo de Hornos
- Reserva Nacional Pinguino Humboldt
- Reserva Nacional Laguna Torca
- Reserva Nacional Katalalixar
- Reserva Nacional Isla Mocha
- Reserva Nacional Las Guaitecas
- Reserva Nacional Alacalufes
- Monumento Natural La Portada
- Monumento Natural Cachagua
- Monumento Natural Cinco Hermanas

Proposed New MPAs:

- Parque Nacional Chiloé:
- Reserva Nacional Pingüinos de Humboldt:

(Hurtado 1995)

#### 1.3.5.2 Colombia

**Total Population:** 43,733,000 (HDR 2002)

**GDP (current US\$):** 80,925,073,408 (HDR 2002)

**Maritime Claims:**

territorial sea: 12 NM

continental shelf: 200-m depth or to the depth of exploitation

exclusive economic zone: 200 NM (CIA 2004)

**Length of Coastline:** 3,208 km (Caribbean Sea 1,760 km, North Pacific Ocean 1,448 km) (CIA 2004)

**Marine Protected Areas:**

- Parque Nacional Natural Isla Gorgona: (49,200 hectares)
- Parque Nacional Natural Utria: (53,400 hectares)
- Parque Nacional Sanquianga: (80,000 hectares)

Proposed New MPAs:

- Isla del Malpelo

(Hurtado 1995)

### **1.3.5.3 Ecuador**

**Total Population:** 12,818,000 (HDR 2002)

**GDP (current US\$):** 24,310,999,040 (HDR 2002)

**Maritime Claims:**

territorial sea: 200 NM

continental shelf: 100 NM from 2,500 meter isobath (CIA 2004)

**Length of Coastline:** 2,237 km (CIA 2004)

**Marine Protected Areas:**

- Reserva de Recursos Marinos Galápagos
- Santuario de Ballenas de Galápagos
- Parque Nacional Machalilla
- Reserva Ecologica Manglares-Churute

(Hurtado 1995)

### **1.3.5.4 Panama**

(N.B. Panama supports and participates in the Action Plan (UNEP 2001))

**Total Population:** 2,940,000 (HDR 2002)

**GDP (current US\$):** 12,295,799,808 (HDR 2002)

**Maritime Claims:**

territorial sea: 12 NM

contiguous zone: 24 NM

exclusive economic zone: 200 NM (CIA 2004)

**Length of Coastline:** 2,490 km (CIA 2004)

**Marine Protected Areas:**

- Isla Coiba
- Refugio de Vida Silvestre Golfo de Montijo: (80,765 hectares)
- Refugio de Vida Silvestre Isla Iguana: (53 hectares)
- Refugio de Vida Silvestre Isla Taboga
- Parque Nacional Sarigua: (8,000 hectares)
- Parque Nacional Cerro Holla: (32,557 hectares)

Proposed New MPAs:

- Isla de las Perlas (Pearl Islands)
- Manglares de San Miguel

(Hurtado 1995)

### **1.3.5.5 Peru**

**Total Population:** 26,749,000 (HDR 2002)

**GDP (current US\$):** 56,517,062,656 (HDR 2002)

**Maritime Claims:**

territorial sea: 200 NM

continental shelf: 200 NM (CIA 2004)

**Length of Coastline:** 2,414 km (CIA 2004)

**Marine Protected Areas:**

- Parque Nacional Paracas
- Zona de Reserva Punta San Juan
- Santuario Nacional de los Manglares de Tumbes: (2,972 hectares)
- Santuario Nacional de las Lagunas de Mejía: (690 hectares)
- Zona de Reserva de los Pantanos de Villa: (396 hectares).

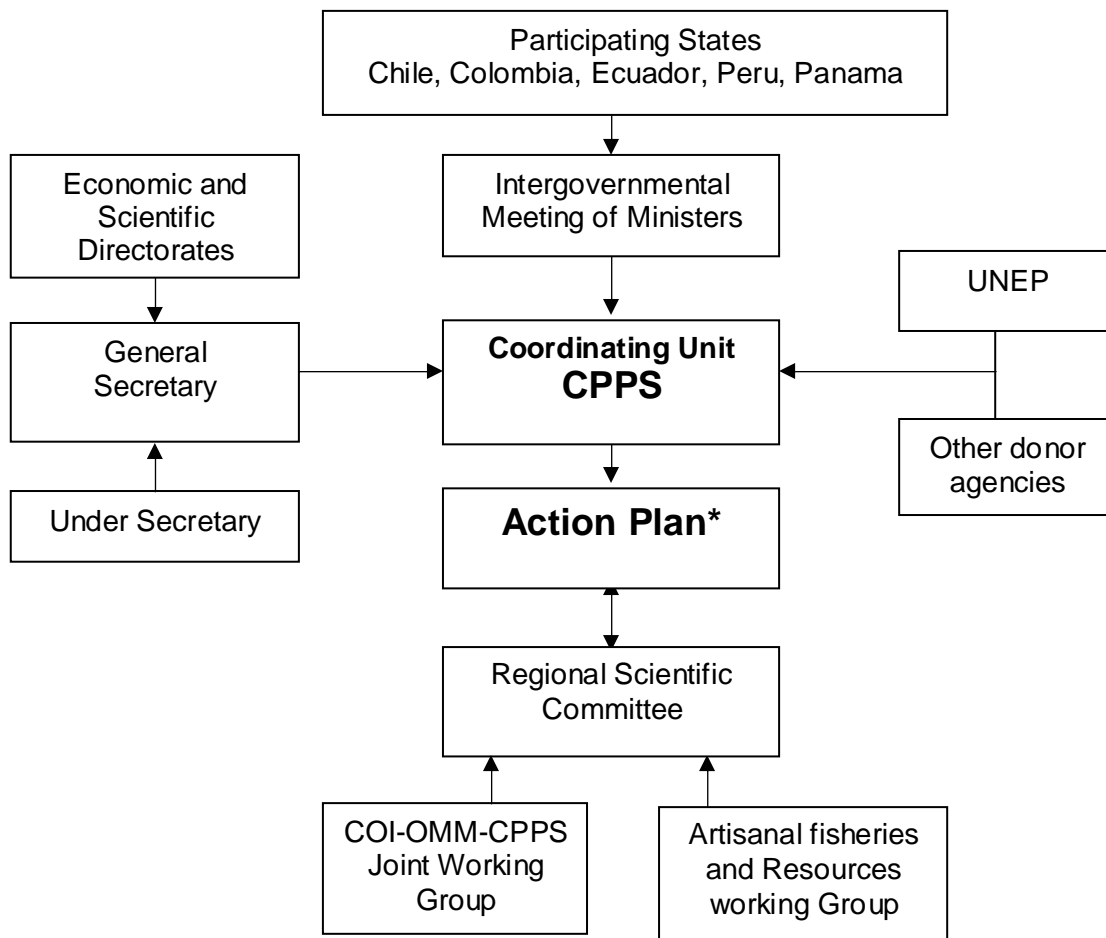
Proposed New MPAs:

- Estuarios de Virrilá
- Peninsula de Carro Illescas e Islas Lobos
- Manglares de San Pedro
- Bahía San Fernando
- Banco de Máncora

(Hurtado 1995)

## Organization

### 1.3.6 Institutional Structure



CPPS: The Permanent Commission for the South Pacific  
Action Plan\* for the Protection of the Marine Environment and Coastal Areas of the South-East Pacific

### 1.3.7 Ministerial Meetings

The Meeting of Ministers of Foreign Affairs of each Member State is the highest Authority of the Permanent Commission for the South Pacific. Its specific function is to determine global policies and establish guidelines for the activities carried out by the CPPS. Its aim is to promote and secure the principles and objectives of the Organization, establish policies and adopt action plans (CPPS 2004).

Meeting	Place	Date
1 <sup>st</sup> MM	Cali, Colombia	24 January, 1981
2 <sup>nd</sup> MM	Viña del Mar, Chile	10 February, 1984
3 <sup>rd</sup> MM	Quito, Ecuador	10 December, 1987
4 <sup>th</sup> MM	Lima, Peru	4 March, 1993
5 <sup>th</sup> MM	Santafé de Bogotá, Colombia	4 August, 1997
6 <sup>th</sup> MM	Santiago, Chile	August, 2000
7 <sup>th</sup> MM	Santiago, Chile	August, 2002

**Last Meeting: to come**

**Next Meeting: to come**

### 1.3.8 Coordinating Unit

#### The Permanent Commission for the South Pacific (CPPS)

CPPS is the regional maritime organization responsible for the coordination of the maritime policies of its Member States: Colombia, Chile, Ecuador and Peru. The organization was established on 18 August 1952, under the name of "Permanent Commission for the Conference on Exploitation and Conservation of the Marine Resources in the South Pacific", as a result of "Declaration on the Maritime Zone" subscribed at Santiago by the Governments of Chile, Ecuador and Peru. Colombia joined the CPPS on 9 August, 1979 (CPPS 2004).

The General Secretariat is supported by an Under-Secretariat (the Under-Secretary replaces the General Secretary during his absence). The latter coordinates legal matters and promotes the nature of the CPPS as a regional maritime organization. A Scientific Directorate and an Economic Affairs Directorate also assist the General Secretariat. The link between the CPPS and the Governments of the Member States is through the National Sections, subordinate to the Ministry of Foreign Affairs of each State (CPPS 2004).

#### Contacts:

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Website: [www.cpps-int.org](http://www.cpps-int.org)

## **1.3.9 Secretariat**

### **1.3.9.1 General Secretariat**

The General Secretary is the international and legal representative of the CPPS and is responsible for its organization and operation. The position of General Secretary is held on a rotational basis during a four-year mandate. In accordance to international practice, the country acting as permanent seat for the General Secretariat cannot accede to this position. The General Secretary duties are to:

Seek international cooperation and take the necessary steps to obtain resources to carry out programs and projects approved by the Assembly.

Seek and arrange contributions by the private sector to implement projects and programs.

Plan programs and projects in areas determined by the Assembly.

Ensure the application of Arrangements, Protocols, Declarations, Resolutions and other rules under the legal structure of the CPPS.

Comply with the mandates and resolutions set forth by the Assembly.

Establish objectives/aims for each Directorate and Administrative Area of the General Secretariat.

Maintain regular links with the Party States, providing the technical support required by the National Sections.

Put forth proposals to the Assembly, in accordance to its sphere of competence and submit initiatives and recommendations to facilitate the compliance of the Organization's objectives.

Undertake studies and propose measures for the sustainable utilization of marine resources.

Contribute to increased awareness among the general public.

Assess and inform the Assembly and the National Section on the application of Agreements, Protocols, Declarations, Resolutions and other arrangements.

Prepare technical reports/studies upon request by the Assembly, the National Sections, Work Groups etc. deemed necessary to comply with its objectives.

Develop agendas for annual work programs and plans, as well as the Organization's budget for the Assembly's consideration.

Seek the services of an international and independent audit company at the closing of each financial year.

Submit a report to the Assembly concerning the financial status of the Organization (CPPS 2004).

**General Secretary:**

Mr. Gonzalo Pereira Puchy

**Contacts:**

Comision Permanente de Pacifico Sur (CPPS)

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**1.3.9.2 Under Secretariat**

The Under-Secretariat supports the General Secretary and coordinates legal matters. In coordination with the other two Directors, the Under-Secretary submits programs and work plans to the General Secretariat, for its consideration and execution, in compliance with the mandates of the Assembly (CPPS 2004).

The Under-Secretary's action is directly involved with the major topics covered by the United Nations Convention on the Law of the Sea (UNCLOS), such as the legal aspects of high seas fishing, prospecting, research and exploitation of sea beds, as well as those issues examined and resolved in meetings of the States Parties to the UNCLOS. Other legal aspects include the ratification and implementation of the Framework Agreement for the Conservation of Living Marine Resources in the High Seas of the Southeast Pacific, "Galapagos Agreement" (CPPS 2004).

With relation to the Meeting of States Parties to the UNCLOS, before which the CPPS has Observer Status, the Under-Secretariat is tasked with preparing follow-up reports concerning this forum, for submission to the National Sections through the General Secretariat. The Under-Secretariat is also engaged in matters related to the International Court on the Law of the Sea and the continental shelf (CPPS 2004).

**Under-Secretary:**

Mr. Gonzalo Pereira Puchy

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### **1.3.10 Scientific Directorate**

The Scientific Directorate coordinates and fosters the development of scientific and technological activities, Programs and Projects concerning marine related matters of common interest to the Member States of the CPPS. These subject matters are identified in special meetings with the participation of researchers and multi-disciplinary officers from over 22 technical marine related institutions of the four Member States. Governments, within the framework of their maritime policies, approve Programs and Projects and instruct the General Secretariat to take charge of their execution, development and monitoring (CPPS 2004).

The Directorate coordinates: studies and assessments of the main marine resources and their fisheries with the aim to contribute towards their sustainable exploitation and management; oceanographic and meteorological studies related to the Southeast Pacific, with special emphasis on ENSO (El Niño Southern Oscillation); and technical and economic cooperation with public and private international organizations (CPPS 2004).

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### **1.3.11 Regional Scientific Committee**

The ERFEN Programme's Scientific Committee is the backbone of the regional research capacity on marine climate and climate variability, with special emphasis on El Niño, La Niña ENSO events. The Committee is comprised of experts from the region, such as oceanographers, meteorologists, climatologists, biologists, fisheries engineers, and researchers in the social and economic fields. The Committee is permanently working and meets on a regular basis (extraordinarily in the case of drastic climate changes), combining studies and data and preparing technical reports aimed at Governments, technical institutions and social and productive sectors. The Committee performs its activities in accordance to Article XIII of the ERFEN Protocol and emphasizes scientific research and technical cooperation (CPPS 2004).

## Meetings

Meeting	Date	Place
1 <sup>st</sup>	November 1980	Lima, Peru
2 <sup>nd</sup>	23-26 November 1981	Lima, Peru
3 <sup>rd</sup>	16-19 February, 1983	Cali, Colombia
4 <sup>th</sup>	28-30 May, 1984	Lima, Peru
5 <sup>th</sup>	21-24 April, 1986	Bogotá, Colombia
6 <sup>th</sup>	22-26 June, 1987	Callao, Peru
7 <sup>th</sup>	21-23 November, 1988	Viña del Mar, Chile
8 <sup>th</sup>	21-25 May, 1990	Cali, Colombia
9 <sup>th</sup>	1991	Chile
10 <sup>th</sup>	22-25 November 1993	Guayaquil, Ecuador
11 <sup>th</sup>	15-19 May 1995	Lima, Peru
12 <sup>th</sup>	6-11 October, 1997	Bogotá, Colombia
13 <sup>th</sup>	2-4 Noviembre, 1998	Guayaquil, Ecuador
14 <sup>th</sup>	25-27 October, 2000	Callao, Peru
15 <sup>th</sup>	27-29 October, 2001	Bogotá, Colombia

**Next Meeting: to come**  
**Contacts: to come**  
**Website: to come**

### 1.3.12 Working Groups

#### 1.3.12.1 COI-OMM-CPPS

The COI-OMM-CPPS Joint Working Group aims its efforts at El Niño related Research. It was established through resolution COI x-2 in November, 1977. The Joint Working Group is an extended regional forum between the technical-scientific institutions in the Member States of the CPPS and specialized bodies of the United Nations: Intergovernmental Oceanographic Commission (COI) and the World Meteorological Organization (WMO). The actions of the Joint Working Group are in accordance with the Terms of Reference, approved by its 8<sup>th</sup> Meeting held at Concepción, Chile, on 17-18 April 1996. Its main tasks are: promoting the El Niño related activities, including those supporting the CPPS-ERFEN Program (Regional Study of the El Niño Phenomenon); coordinating regional, national and international organizations; fostering activities related to the social and economic impact of the El Niño; drawing proposals, and others (CPPS 2004).

## Meetings

Meeting	Date	Place
1 <sup>st</sup>	16-20 October, 1978	Callao, Peru
2 <sup>nd</sup>	10-14 November, 1980	Guayaquil, Ecuador
3 <sup>rd</sup>	February, 1983	Cali, Colombia
4 <sup>th</sup>	31 May - 2 June, 1984	Lima, Peru
5 <sup>th</sup>	3-5 November, 1986	Guayaquil, Ecuador
6 <sup>th</sup>	24-26 November, 1988	Viña del Mar, Chile
7 <sup>th</sup>	16-18 January, 1992	Cartagena, Colombia
8 <sup>th</sup>	17-18 April, 1996	Concepción, Chile
9 <sup>th</sup>	5-7 November, 1998	Guayaquil, Ecuador

**Next Meeting: to come**

**Contacts: to come**

**Website: to come**

### **1.3.12.2      *Artisanal Fisheries and Resources***

Artisanal fishery, also called Small Scale Fishery, is a special activity in light of its social and economical significance, as an important source of work and income (CPPS 2004). For further information link to:

<http://www.cpps-int.org/english/artisanalfisheriesandresources.html>.

**Next Meeting: to come**

**Contacts: to come**

**Website: to come**

### **1.3.13      Economic Directorate**

This Economic Directorate is responsible for supporting and providing advisory assistance to the General Secretariat. The main functions are:

- Responsible for trade, business and other related aspects;
- Promote international cooperation and the Organization's strategic planning;
- Report the results of its work to the General Secretariat;
- Recommend research and studies of common interest to the General Secretariat, the execution of which should be suggested to the National Sections; and
- Prepare an annual program of activities (CPPS 2004).

**Next Meeting: to come**

**Contacts: to come**

**Website: to come**

### 1.3.14 National Focal Points

Country	Contact
Bulgaria	To come
Romania	To come
Russian Federation	To come
Georgia	To come
Turkey	To come
Ukraine	To come

## 1.4 Financial Arrangements

[blank]

## 1.5 Wider Cooperation

### Horizontal Cooperation among Regional Seas Conventions and Action Plans

The Permanent Commission for the South Pacific (CPPS) and the South Pacific Environment Programme (SPREP) signed in 2001 a Memorandum of Cooperation (MoU) in the framework of twining arrangement between two Regional Seas Programmes (RSPs), promoted by UNEP as a result of recommendations of the 3<sup>rd</sup> Global Meeting of Regional Seas Convention on Action Plans held in Monaco.

The horizontal cooperation comprises the development of joint activities; the coordination of bioregional meetings to review the state of the marine environment in the South Pacific as a whole; exchange of information and the cooperation in capacity building in institutional aspects. The identified areas of cooperation are: Research and Monitoring of the Marine Pollution; Integrated Coastal Zone Management (ICZM); Coastal and Marine Protected Areas (MPAs); climate change; biodiversity and natural resource conservation and environmental education.

The 22<sup>nd</sup> Session of UNEP Governing Council (GC)/Global Ministerial Environment Forum, through the Decision No.22/2-IIIIE requested the Executive Director to strengthen horizontal cooperation as well as twining arrangement established by the CPPS and the SPREP and to support the organization of an inter-regional conference between those two regions, in addition to a conference between the RSP of the Pacific Basin in 2004, in order to develop knowledge of the state of the marine environment in the Pacific.

In the process of implementation of this twining arrangement the CPPS' representative attended the 14<sup>th</sup> Meeting of SPREP Governing Council and Ministerial Meeting held in Apia, Samoa, September 2003, and maintained bilateral meetings with SPREP' Director and staff, in order to implement the MoU and UNEP GC Decisions. It was agreed that the Bioregional Conference between CPPS and SPREP will be held in 2004 with a technical and financial support of UNEP according to the above mentioned UNEP GC decisions.

### Cooperation with Multilateral Environmental Agreement

The Secretariat of the "Lima Convention" aware that the Regional Seas Conventions and Action Plans constitutes an efficient platform for the regional implementation of

the provisions of the Global Environment Agreement, established a formal cooperation linkage firstly with the Secretariat of the Convention on Biological Diversity, through a Memorandum of Cooperation (MoU) signed in 1991, among others, to promote and facilitate the regional implementation of Jakarta Mandate on issues regarding: marine and coastal protected areas; conservation of coastal and marine resources and ecosystems; integrated coastal and marine area management; effects of pollution on marine and coastal biodiversity. In the process of implementation of this MoU it was carried out joint activities such as regional workshops on alien species; mariculture; protected areas; ballast water management.

Another MoU was signed between the Secretariat of CPPS and the Secretariat of the Basel Convention in 2002, with the purpose to develop a regional level joint activities for the control of transboundary movements of hazardous wastes, which includes among others the design and development of education materials and training programs; cooperation in monitoring the effects of the management of hazardous wastes of human health and on the marine and coastal environment; transfer of technology and systems regarding to environmental sound management of hazardous wastes.

A similar MoU is currently in consultation with the Secretariat of the Framework Convention on Climate Change and with Ramsar Convention.

**Link to Regional Agreements:** <http://www.cpps-int.org/english/regionalagreements.html>

**Link to Inter-institutional Agreements:** <http://www.cpps-int.org/english/interinstitutionalagreements.html>

**Santiago Declaration:** <http://www.cpps-int.org/english/santiagodeclaration.html>

#### **Maritime Zone Declaration**

Complementary agreement to the Declaration of Sovereignty over the 200 mile maritime zone, Lima, 4 Decmeber 1954:

<http://www.cpps-int.org/english/declarationonmaritimezone.html>.

#### **Galapagos Agreement**

Framework Agreement for the Conservation of Living Marine Resources in the High Seas of the Southeast Pacific:

<http://www.cpps-int.org/english/galapagosagreement.html>.

#### **The Convention for the Establishment of an Inter-American Tropical Tuna Commission**

The Convention, which was adopted in 1949 and came into force in 1950, deals with yellowfin and skipjack tuna (and other species taken by tuna fishing boats) in the East Pacific Ocean. The Convention provides for investigation into population, biology and ecology of yellowfin and skipjack tuna and species used as bait; and into effects of natural and human impacts on those species. It also provides for analysis of information regarding population trends; studies of fishing methods and methods of maintaining and increasing populations; control over taking; joint action to ensure maximum sustained catch; compilation of catch statistics; publication of reports and scientific, statistical and other data. The principal duties of the Inter-American Tropical Tuna Commission are to study the biology of the tunas and related species of the Eastern Pacific Ocean, with a view to determining the effects that fishing and natural factors have on their abundance, and to recommend appropriate

conservation measures so that the stocks of fish can be maintained at levels which will afford maximum sustainable catches. In 1976 the Commission's duties were broadened to include work on the problems arising from the tuna-dolphin relationship in the Eastern Pacific Ocean. It was decided that the Commission should strive to maintain a high level of tuna production and also to maintain porpoise stocks at or above levels that ensure their survival in perpetuity with every reasonable effort being made to avoid needless or careless killing of porpoise (GIWA 2004). Inter-American Tropical Tuna Commission <http://www.iattc.org/>

### **Eastern Pacific Ocean Tuna Fishing Agreement**

The Agreement of 1984 applies to certain highly migratory species of tuna and tuna related fish in the Eastern Pacific Ocean. Provides for the establishment of a Council entrusted with the task of implementing the agreement. Provides for the issuance of international licenses authorizing holders to fish for the species covered by the Agreement in the Agreement Area including the EEZ of states, which are parties thereto (coastal states of the eastern Pacific Ocean or members of the Inter-American Tropical Tuna Commission). The 12-mile territorial sea is, however, outside the Agreement Area. The Agreement empowers the Council to make recommendations to parties concerning tuna resources but not until all States that fish for tuna in the area have acceded to the agreement (GIWA 2004).

## **1.6 Partners**

- UN Economic Commission for Latin America and the Caribbean (ECLAC) <http://www.eclac.org/index1.html>.
- Organisation of American States (OAS) <http://www.oas.org/>
- UNEP Regional Office for Latin America and the Caribbean (ROLAC) [http://www.rolac.unep.mx/indice\\_i.htm](http://www.rolac.unep.mx/indice_i.htm).
- Inter-American Development Bank (IADB) <http://www.iadb.org/>
- International Centre for Living Aquatic Resources Management (ICLARM) <http://www.worldfishcenter.org/>
- International Coral Reef Initiative (ICRI) [www.icri.org.uk](http://www.icri.org.uk)
- Coral Health and Monitoring Programme (NOAA) <http://coral.aoml.noaa.gov/index.html>
- Global Environment Facility (GEF)\* [www.gefweb.org](http://www.gefweb.org).

### **GEF Projects in the Region**

- UNDP - GEF - Biodiversity: Conservation of Biodiversity in the Lake Titicaca Basin <http://edcnts2.cr.usgs.gov/gef/gef.asp?fipscode=202>
- World Bank - GEF - International Waters/Biodiversity: Water Resources and Biodiversity Management, Chile
- World Bank - GEF - Biodiversity: Sustainable Use of Biodiversity in the Western Slope of the Serrania del Baudo, Colombia <http://edcnts2.cr.usgs.gov/gef/gef.asp?fipscode=625>.
- World Bank - GEF - Biodiversity: Monitoring System for the Galapagos Islands <http://edcnts2.cr.usgs.gov/gef/gef.asp?fipscode=601>
- World Bank - GEF - Biodiversity: Wetland Priorities for Conservation Action, Ecuador <http://edcnts2.cr.usgs.gov/gef/gef.asp?fipscode=628> (GIWA 2004).

## **2 Our Work**

### **2.1 Programme Strategy**

Link to Regional Seas Strategic Directions 2004-2007, downloadable document: to come.

### **2.2 Action Plan**

**Action Plan for the Protection of the Marine Environment and Coastal Areas of the South-East Pacific**

**Year Adopted:** 1981 (UNEP 2001)

**Participating Countries:** Chile, Colombia, Ecuador, Peru and Panama (UNEP 2001)

**For full text of the Action Plan link to:**

<http://www.cpps-int.org/english/planofaction/index.html>.

### **2.3 Convention**

**Convention for the Protection of the Marine Environment and Coastal Areas of the South-East Pacific**

**Short Title:** Lima Convention

**Year adopted:** 12 November 1981 (UNEP 2001)

**Year entered into force:** 1986 (UNEP 2001)

**Contracting Parties:** Chile, Colombia, Ecuador and Peru (N.B. Panama supports and participates in the Action Plan (UNEP 2001))

**Depositary State:** Commission of the South Pacific (UNEP 2001)

**Ratification:** [blank]

#### **2.3.1 Protocols**

**Agreement on Regional Cooperation in Combating Pollution in the South East Pacific by Hydrocarbons and other Harmful Substances in cases of Emergency**

**Signed:** 12 November 1981

**Participating Countries:** Chile, Colombia, Ecuador, Peru and Panama

**Complementary Protocol on the Agreement for Regional Cooperation in Combating Pollution in the South East Pacific by Hydrocarbons and other Harmful Substances in Cases of Emergency**

**Adopted:** 22 July 1983

**Entered into force:** 1987

**Participating Countries:** to come

**Protocol for the Protection of the South East Pacific Against Pollution from Land- Based Sources**

**Adopted:** 1983

**Entered into force:** 1986  
**Participating Countries:** to come

**Protocol for the Conservation and Management of Protected Marine and Coastal Areas of the South East Pacific**

**Adopted:** 1989  
**Entered into force:** 1984  
**Participating Countries:** to come

**Protocol for the Protection of the South East Pacific from Radioactive Pollution**

**Adopted:** 21 September 1989  
**Entered into force:** 1995

**Proposed Protocol on the Assessment of the Environmental Impact on the Marine Environment and Coastal Areas the South East Pacific**

**Signed:** to come  
**Participating Countries:** to come

**Proposed Protocol to Prohibit Transboundary Movements of Hazardous Wastes and their Disposal to the South East Pacific**

**Signed:** to come  
**Participating Countries:** to come

**Protocol on the regional program for the study of the El Nino phenomenon in the South East Pacific (ERFEN)**

**Adopted:** 6 November 1992  
**Participating Countries:** Chile, Colombia, Ecuador and Peru.

**For further information on the Convention and associated Protocols link to:**  
<http://www.cpps-int.org/english/planofaction/conventionsandprotocols.html>.

## **2.4 Issues and Threats**

### **2.4.1 Habitat and Species Loss**

Coastal marine vegetation in the region is endangered by the intense coastal development of various activities in the region, including those linked with urbanization and rapid population increases. These activities include the discharge of untreated sewage, discharge of industrial wastes in rivers and at sea, and shrimping activity. Shrimping activity is one of the causes of coastal degradation through the destruction of mangrove ecosystems, deterioration in the quality in estuaries and loss of habitats (UNEP 1999).

There are many endangered or threatened species in the region. In Chile the sea snail (*Concholepas concholepas*), sea urchin (*Loxechinus albus*), Juan Fernandez rock lobster (*Jasus frontalis*), southern king crab (*Lithodes antarctica*), guano birds, penguins, sea otters, cetaceans and the algae (*Durvillea antarctica*) are all endangered due to overexploitation and pollution (UNEP 1999). The dugong is listed as vulnerable to extinction at a global scale by the World Conservation Union (IUCN). Sandy beaches and dunes provide important nesting sites for marine turtles in Central America. Four species of marine turtle are now endangered the green (*Chelonia mydas*), the olive Ridley (*Lepidochelys olivacea*), hawksbill (*Eretmochelys imbricata*), and the leatherback (*Dermochelys coriacea*). Even though the countries

in the region have reinforced national legislation to provide protection for marine turtles, it is evident that there is inadequate control to ensure compliance with these laws (Hurtado 1995).

In addition climate changes have also had devastating consequences on the ocean pelagic fisheries of Chile, Peru and Ecuador, and the marine fauna that relies on these normally highly productive areas. El Niño events have also been associated with episodes of coral bleaching and mortality (Hurtado 1995).

#### **2.4.2 Land Based Sources of Pollution**

Populations are increasing in coastal areas due to high population growth rates and constant migration from rural to urban areas. This fact and the increasing pollution load from land based sources is contributing to the deterioration of the coastal areas (UNEP 1999).

Pollution from land-based sources consists of untreated sewage discharge, agricultural runoffs containing pesticides, nitrates and phosphates, ill-managed coastal development and emissions of contaminants from the ever-expanding industries. In Chile marine pollution from industrial activity generating liquid and solid wastes are discharged directly into the sea untreated causing grave damage to the quality of the aquatic environment. The mining and the fishery industry, agriculture and domestic sewerage are causing the bioaccumulation of heavy metals in fish and shellfish (UNEP 1999).

Runoff from terrestrial sources and from untreated sewage has led to eutrophication in many areas of the region (e.g. Tomaco in Colombia). Tomaco also has problems with dumps of shavings and saw dust in the mangrove plantations, carried out in order to harvest shrimp and this causes serious damage to mangrove ecosystems. In Ecuador shrimping activity is one of the causes of coastal degradation through the destruction of mangrove ecosystems, deterioration in the quality in estuaries and loss of habitats. Other polluted beaches found in Colombia include Buenaventura. In Panama the areas with the greatest sanitation risk and with severe pollution are the Bay of Panama, Matasnillo River, Club Union and the Club de Yates. In Peru the worst areas are Paita, Chimbote, Calloa, Pisco and Ilo (UNEP 1999).

#### **2.4.3 Sea Based Pollution**

Approximately 100,000 barrels per day of crude oil (0.3% of the world's seaborne oil) transit the coastal waters of the South-east Pacific region, whilst some 50,000 barrels per day pass through the Strait of Magellan. Increasing activity in the petroleum sector in recent years has seen a corresponding rise in the amount of oil and petroleum products being transported in this area. Over 1,000 tankers call annually at ports in the region. There are relatively few navigational hazards in the region, the main exception being the Strait of Magellan. The volume of tanker traffic through the Strait is relatively low at present, but increasing steadily as oil exploration and production activity expands in the region. In addition, there is an increasing number of modern vessels in transit that are too large to use the Panama Canal (ITOPF 2003).

There have been a number of spills here during the last 25 years, mainly as a result of groundings. The difficulties and dangers in navigating the Strait are exacerbated

by the prevalence of bad weather, especially towards the western end of the Strait and by the generally foul and rocky character of the anchorages. There have been a number of other major spills within the region, more than might be expected given the relatively low traffic densities. For example in 1976 the tanker Saint Peter exploded releasing 32,800 tonnes of crude oil into Colombian waters. More recently, in 1987, the tanker Cabo Pilar grounded off the coast of Chile releasing 5,200 tonnes of crude oil into the sea (ITOPF 2003).

All the countries in the region have developed national contingency plans and have response equipment to deal with Tier 1 spills. Chile, which has experienced more major spills than the other countries in the region, has also established a Tier 2 capability by means of a number of government-owned stockpiles located throughout the country. Ecuador and Colombia also have comprehensive spill response capabilities. The state oil companies of Colombia, Ecuador and Venezuela have agreements for mutual cooperation in place. In 1987 the Comision Permanente del Pacifico Sur (South Pacific Permanent Commission) adopted an agreement for assistance and cooperation in case of oil spills in Chile, Colombia, Ecuador, Peru and Panama and a contingency plan was approved. ROCRAM (Operative Network for Regional Cooperation among Maritime Authorities of South America) is a co-operative agreement between the maritime nations of South America, Mexico, Panama & Cuba, designed to encourage development and operation in anti-pollution measures. Most of the Latin American oil companies, including the state and privatised companies, are members of ARPEL, the Regional Association of Oil and Natural Gas Companies in Latin America and the Caribbean. In the event of a spill, member companies can call upon the organisation and fellow members for advice and resources. ARPEL has several ongoing initiatives concerning cooperative agreements and contingency planning. Although these are not legally binding, participation and adherence to these initiatives is encouraged (ITOPF 2003).

The shipping of products for export generates large volumes of waste, which is discharged directly into the sea in the region. The disposal of these wastes causes silting on the sea bed. As a result public works authorities must carry out dredging works from time to time on the sea bed under harbours and maritime terminals. The effect on the coastal marine ecosystem varies according to the type and volume of the waste disposed of, the most significant are those resulting from the mining sector (UNEP 1999).

#### **2.4.4 Alien Species**

The common carp (*Cyprinus carpio*), has been introduced as a food and ornamental fish, in South America. It is considered a pest because of its abundance and its tendency to reduce water clarity and destroy and uproot aquatic vegetation, used as habitat by a variety of aquatic species. In addition the mosquito fish (*Gambusia affinis*) has been introduced throughout South America and has harmed aquatic ecosystems because of their highly predaceous habits. Intentional release by mosquito-control agencies continues. The large-mouth bass (*Micropterus salmoides*) has been widely introduced and have, in some places affected populations of small native fishes through predation, sometimes resulting in the decline or extinction of such species. The Mozambique tilapia (*Oreochromis mossambicus*) has spread worldwide through introductions for aquaculture. Established populations of this species in the wild are a result of intentional releases or escapes from fish farms. The brown trout (*Salmo trutta*) was introduced around the world for aquaculture, and

stocked for sport fisheries. It is blamed for reducing native fish populations, especially other salmonids through predation, displacement, and food competition (ISSG 2004)

## **2.4.5 Exploitation of Resources**

Population growth and new technologies has lead to increased stress on the resources of the region. The cold, nutrient-rich waters of the Humbolt Current support one of the world's most productive fisheries. More than 16% of the total catch of the Pacific Ocean is caught off the coasts of Colombia, Ecuador, Peru and Chile; the potential sustainable fisheries yield is estimated to be 12.6 million tons annually (Hurtado 1995). The Gulf of Panama is the area with the greatest biological productivity because of the great width of the continental shelf, the seasonal outcrop and the high output of drainage basins. In Colombia the harvesting of saltwater shrimp is exploited with an area of 39,500 ha. Similarly shrimp harvesting is economically important in Chile and Ecuador. Further environmental problems have been associated with the harvesting of shrimps such as the destruction of mangrove ecosystems, deterioration in the water quality in estuaries and loss of habitats. There is a need for the sustainable management of the fishery industries in the region (UNEP 1999).

## **2.5 Current Activities**

### **2.5.1 Pollution Research and Monitoring**

#### **Coordinated Regional Program for the Research, Surveillance and Control of Marine Pollution of the South East Pacific (CONPACSE 2000)**

The environment assessment is mainly carried out within the context of CONPACSE. The activities carried out included the execution of research programs for the assessment of oil hydrocarbons, heavy metals, persistent organic pollutants, and radioactive contamination, among others. They also included studies on microbial pollution, studies on the effect of pollution on living resources populations. Various regional workshops and courses were organized, the main ones being:

The First International Conference on Research and Surveillance of Marine Pollution in the South East Pacific;

The Latin American Workshop on Security and Prevention of Marine Pollution; and

The International Workshop of Radioactive Pollution.

A Meeting of Experts to Review the Progress of CONPACSE and the Degree of Marine Environmental Pollution in the South East Pacific was held in Guayaquil, Ecuador, in January 1996. The 2<sup>nd</sup> Meeting of the Ad Hoc Group of Experts on Radioactive Contamination was held in April 1996. This Group prepared a Profile of the South East Pacific Radioactive Contamination Research and Monitoring Programme and drafted a Radioactive Contamination Contingency Plan. A Regional Inventory on Land-based Sources of Marine Pollution was simultaneously prepared in addition to study the state of the Marine Environment in the South East Pacific and a Regional Diagnostic of Land-based Activities Affecting the Marine, Coastal and Associated Freshwater Environments in the South East Pacific. In 1996 two meetings of experts, one in Bogota, Colombia, and another one in Lima- Peru, were held with

the purpose to examine the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. A Course on Sea Outfalls and other Sewage Disposal Methods was held in Viña del Mar, Chile, in 1997. This course assisted in building national capacity to seek solutions to the serious pollution problem caused by domestic waste (CPPS 2004). There is an existing programme for monitoring levels and effects of pollution directed by Institute del Mar of Peru (IMAPRE) in selected areas along the Peruvian coast (UNEP 1999).

In accomplishment to the 2003 working programme a Consultation on updating of the Regional Contingency Plan on Oil Spill in the South East Pacific (with the support of IMO) and a Regional Training Course on Preparedness, Response and Control in Cases of Oil Spill (UNEP/IMO/CPPS) was carried out.

A Medium Size GEF Project for the Prevention, Reduction and Control of Pollutants in the Eastern Equatorial Pacific and Humboldt Current Large Marine Ecosystem: South East Pacific Component, is in the final process of evaluation of the GEF/UNEP. This project will allow the effective regional implementation of GPA, the LBA Regional Protocol for the South East Pacific and the Regional Programme for the Protection of the South East Pacific from Land-based Activities (PROSET).

The CPPS is currently participating as a Focal Point of the Global International Water Assessment - GIWA Project to the Sub-region 64 (Humboldt Current) and 65 (Eastern Equatorial Pacific). This project is producing an important mobilization of scientists on environment and socio-economic issues following the GIWA Methodology on Scaling and Scoping, Detailed Assessment, Causal Chain Analyses and Policy Option Analysis.

For further information link to: <http://www.cpps-int.org/english/planofaction/marinepollution.html>

## **2.5.2 Integrated Coastal Zone Management**

The 4<sup>th</sup> Intergovernmental Meeting of the Action Plan approved the Regional Environmental Management Plan of Marine and Coastal Areas in the South East Pacific, with the purpose of defining the general policy guidelines and the environmental regulations and increase knowledge on issues relating to coastal and marine areas of the South East Pacific, as systems so that the countries in the region will achieve an adequate and harmonious management of such areas. National Groups were then formed to carry out case studies. The first stage of the execution of the study cases on Environmental Management in Bahía de Valparaíso (Chile), Tumaco (Colombia), Bahía de Caráquez (Ecuador) Pisco-Ica (Perú), and Bique-Vacamonte (Panamá) was completed. The Meeting of Experts on Environmental Management of Coastal and Marine Areas in the South East Pacific was held in November 1995. This meeting evaluated the results of the case studies and recommended to proceed with the second phase, in addition to carrying out the training courses. An integral management course of coastal areas in Guayaquil, Ecuador, under the Programme of Management of Coastal Resources (PMRC) of Ecuador, was carried out in August 1997 (CPPS 2004).

For further information link to: <http://www.cpps-int.org/english/planofaction/integratedcoastalzonesmanagement.html>

### **2.5.3 Marine and Coastal Protected Areas**

The Regional Network of Protected Coastal and Marine Areas in the South East Pacific was approved in 1992 and a work programme for this network was prepared in a meeting of experts.

A Monograph on Protected Marine and Coastal Areas of the South East Pacific was prepared with the support of FAO within the framework of this environmental management mechanism.

A Meeting of the Ad Hoc Group of Protected Coastal and Marine Areas of the South East Pacific was held in June 1995. Among the main objectives of this meeting was the implementation of the "Protocol for the Conservation and Management of Protected Marine and Coastal Areas of the South East Pacific". A 2<sup>nd</sup> Meeting was held in Lima, Peru, July 1998, with the main purpose to examine the advances of the Protocol implementation in relation with the marine and coastal component of the Convention on Biological Diversity (CPPS 2004).

In accomplishment to the 2003 working programme a Fourth Meeting of Experts on Marine and Coastal Protected Areas was carried out.

For further information link to: <http://www.cpps-int.org/english/planofaction/protectedmarineandcoastalareas.html>

### **2.5.4 Biodiversity**

The following studies have been carried out:

Study of the biological diversity in the marine area adjacent to the Chiloé National Park – Chile;  
Contribution to the acquaintance with the coastal marine biological diversity of the Malpelo Island- Colombia;  
National Study of the marine and coastal biological diversity of the Machalilla National Park – Ecuador;  
National Study of the coastal and marine biological diversity of the Coiba National Park, Panama: a proposed management plan; and  
National Study of the marine and coastal biological diversity of the Paracas National Reserve -Peru (CPPS 2004).

For further information link to: <http://www.cpps-int.org/english/planofaction/marineandcoastalbiodiversity.html>

In accomplishment to the 2003 working programme on alien invasive species a Meeting of Experts on the impact of the introduction of Alien Species in the South East Pacific: Problem of the ship ballast water (IMO/CBD/CPPS) was carried out.

## **2.5.5 Climate Change**

### **Regional Group on Implications of Climate Changes in the Marine Environment and in Coastal Areas of the South East Pacific**

The Regional Group is in charge of preparing national and regional reports on the effect of climate changes on the marine and coastal ecosystems of the South East Pacific. In 1991 the Regional Group prepared a regional diagnosis, published under the title "Effects of Climate Changes in the Marine and Coastal Ecosystems in the South East Pacific". The 3<sup>rd</sup> Meeting of the Regional Group, held in Santiago de Chile, 1992, recommended to each member country of the Plan of Action to carry out national case studies on the implication of the socio-economic effects of climate changes, following the methodology recommended by the Intergovernmental Panel of Climate Changes (IPCC 1991), using different scenarios for an accelerated increase in the ocean level to be achieved in the year 2100. The case studies were carried out since 1992 in Tumaco, Colombia; Concepcion, Chile; Estuary of the Chone River in Ecuador, Metropolitan Lima and Callao in Peru and Vacamonte in Panama. The 4<sup>th</sup> Meeting of the Regional Group, September 1996 in Viña del mar, Chile, reviewed the results, analyzed the efficacy of the common IPCC methodology (1991) and examined the applicability of the technical guidelines of IPCC (1995), and identified the areas for future action regarding the anthropogenic effect of climate changes on the marine environment and coastal areas, within the context of the United Nations Framework Convention on Climate Change, to be submitted for analysis to the 8<sup>th</sup> Intergovernmental Meeting of the Plan of Action (CPPS 2004). For further information link to:

<http://www.cpps-int.org/english/planofaction/climatechanges.html>

### **The Regional Program for the Study of the El Niño Phenomenon (ERFEN)**

ERFEN is one of the most important programs developed by the CPPS it carries out its activities with the support of over 22 scientific institutions from Chile, Colombia, Ecuador and Peru. During the last 10 years, the program's efforts have been directed at improving predictions of El Niño events to mitigate its damaging effects and take advantage of its beneficial effects. For further information link to <http://www.cpps-int.org/english/erfenprogram.html>. The Protocol on the regional program for the study of the El Niño phenomenon in the South East Pacific is a legal instrument that strengthens and institutionalizes the ERFEN program (CPPS 2004).

### **Regional Scientific Committee**

The ERFEN Program's Scientific Committee is the backbone of the regional research capacity on marine climate and marine climate variability and performs its activities in accordance to Article XIII of the ERFEN Protocol and emphasizes scientific research and technical cooperation (CPPS 2004).

### **COI-OMM-CPPS Joint Working Group**

The COI-OMM-CPPS Joint Working Group also works on El Niño related Research. The Joint Working Group is an extended regional forum between the technical-scientific institutions in the Member States of the CPPS and specialized bodies of the United Nations: Intergovernmental Oceanographic Commission (COI) and the World Meteorological Organization (WMO) (CPPS 2004). For further information link to:

<http://www.cpps-int.org/english/joinworkinggroup.html>.

CPPS also publishes the Climate Alert Bulletin (BAC) on a monthly basis. For further information link to: <http://www.cpps-int.org/english/bac.html>.

### **Buoy Network Project - INTEGRATED SYSTEM FOR SURVEILLANCE OF MARINE CLIMATE AND ITS VARIABILITY IN THE SOUTHEAST PACIFIC**

**Aim:** To strengthen the observation capacity of the ocean and the atmosphere of the Southeast Pacific through the countries' technical institutions.

#### **Expected results:**

- More effective follow-up of the marine climate under normal conditions and El Niño and La Niña conditions;
- Increased knowledge with regards to the coastal climate of our countries, directly linked to production and services related activities; and
- Contribute to establishing an early warning system to facilitate damage reduction activities and others related to the utilization of benefits (CPPS 2004).

## **2.5.6 Conservation of Marine Mammals**

One of the initial activities was the drafting of a Regional Diagnosis on the state of marine mammals based on the national consultation reports. The Governments, with the purpose of enhancing the application in the South East Pacific of the Global Programme of Action for the Conservation, Management and Use of Marine Mammals, approved the Plan of Action for the Conservation of Marine Mammals in the South East Pacific. A Meeting of Experts was held in Costa Rica in January 1995 resolved that there had been progress in terms of research, management and legislation to protect these species.

A Regional Course on Catch, Monitoring, Data Collection Techniques and Assessment of Marine Mammals Stocks took place in 1997, Guayaquil, Ecuador. National studies have also been conducted on the development of techniques for monitoring marine mammal mortality rates. Several works are currently being carried out to launch different campaigns with the purpose of increasing awareness among communities of artisanal fishermen and authorities (CPPS 2004).

In accomplishment to the 2003 working programme a ICARM Workshop in the South East Pacific. Third Meeting of Experts on Marine Mammals (in preparation) was carried out.

For further information link to: <http://www.cpps-int.org/english/planofaction/marinemammals.html>

## **2.5.7 Fisheries Management**

There is currently a working group on Artisanal Fisheries and Resources is underway in the region.

Link to: <http://www.cpps-int.org/english/artisanalfisheriesandresources.html>.

The methodologies used to study marine resources that are based on hydro acoustics have become increasingly used worldwide due to the technological progress in software and hardware. The application of acoustic methods and equipment, coupled with the use of Geographic Information Systems (GIS), and Remote Sensing (RS), has led to more precise and reliable research. The Member States of CPPS have been applying such methodologies in the study of distribution, abundance and availability of the main fisheries resources, which have proved to be valuable tools for fisheries management. Two workshops on Acoustic Assessment Methodologies were held in March 1992 and February 2000 (CPPS 2004). For further information on the workshops link to:

<http://www.cpps-int.org/english/secondregionalworkshop.html>.

## **2.5.8 Environmental Education**

### **Regional Programme on Environmental Education to the Sustainable Development of the South East Pacific.**

In accomplishment to the 2003 working programme a Regional Workshop on Education to the Sustainable Development of the Coastal and Marine Areas of the South East Pacific (IOC-UNESCO/CPPS) was carried out.

## **3 Publications**

### ***3.1 Regional Seas Reports and Studies***

Link to the Regional Seas Reports and Studies:

[http://www.earthprint.com/show.htm??url=http://www.earthprint.com/cgi-bin/ncommerce3/CategoryDisplay?cgfrnbr=21240&cgmenbr=27973&CGRY\\_NUM=&next=1](http://www.earthprint.com/show.htm??url=http://www.earthprint.com/cgi-bin/ncommerce3/CategoryDisplay?cgfrnbr=21240&cgmenbr=27973&CGRY_NUM=&next=1)

### ***3.2 Meeting Reports***

Meeting of Experts for Cooperation in Marine Mining and Uses of the Southeast Pacific Ocean: Scientific, Technical, Legal, Environmental and Planning Considerations. Quito, Ecuador, 12-16 June, 1989.

Link to: <http://www.cpps-int.org/english/meetingsofexperts.html>

Regional Seminar on Exploration and Exploitation of Sea-beds. July 1999

Link to: <http://www.cpps-int.org/english/meetingsofexperts.html>

Meeting of Experts on Fisheries Subsidies held in Rome, December, 2002. Link to: <http://www.cpps-int.org/english/specialactivities.html>

### **3.3 Other Publications**

Status of the Problem caused by the Presence of the "White Spot" virus (WSSV) in Shrimp Farming of the Coast of Ecuador in 1999.

Special Bulletin prepared by the National Fisheries Institute (INP) Ecuador, December 2000 (140 pgs.)

El Niño: Reality and Fiction  
UNESCO/COI (142 pgs.)

Executive Agenda/Climate  
Ecuador 2001 INAMHI  
(Applications of meteorology and hydrology in agriculture)

Minutes of the Technical Symposium on Artisanal Vessels  
Pan-American Institute of Marine Engineering (IPIN)  
Ecuador, Guayaquil, (ESPOL), 1 and 2 August, 2001 (24 pgs.)

### **3.4 Website Links**

**CPPS** (The Permanent Commission for the South Pacific) [www.cpps-int.org](http://www.cpps-int.org).  
**Inter-American Tropical Tuna Commission** <http://www.iattc.org/>  
**ARPEL** Regional Association of Oil and Natural Gas Companies in Latin America and the Caribbean. <http://portal.arpel.org/wps/portal>  
**ROCRAM** Operative Network for Regional Cooperation among Maritime Authorities of South America <http://www.rocram.mar.mil.br/>.  
**ECLAC** UN Economic Commission for Latin America and the Caribbean <http://www.eclac.org/index1.html>.  
**SPREP** South Pacific Regional Environment Programme <http://www.sprep.org/ws/>.  
**OAS** Organisation of American States <http://www.oas.org/>  
**OAS Water Resources Programme** <http://www.oas.org/usde/waterresources.htm>.  
**ROLAC** UNEP Regional Office for Latin America and the Caribbean [http://www.rolac.unep.mx/indice\\_i.htm](http://www.rolac.unep.mx/indice_i.htm).  
**IADB** Inter-American Development Bank <http://www.iadb.org/>  
**ICLARM** International Centre for Living Aquatic Resources Management <http://www.worldfishcenter.org/>  
**ICRI** International Coral Reef Initiative [www.icri.org.uk](http://www.icri.org.uk)  
**Coral Health and Monitoring Programme (NOOA)** <http://coral.aoml.noaa.gov/index.html>  
**GEF** Global Environment Facility [www.gefweb.org](http://www.gefweb.org).

### **Conservation of Biodiversity in the Lake Titicaca Basin**

<http://edcnts2.cr.usgs.gov/gef/gef.asp?fipscode=202>

**Sustainable Use of Biodiversity in the Western Slope of the Serrania del Baudo, Colombia** <http://edcnts2.cr.usgs.gov/gef/gef.asp?fipscode=625>.

Monitoring Systems for the Galapagos Islands

<http://edcnts2.cr.usgs.gov/gef/gef.asp?fipscode=601>

**Wetland Priorities for Conservation Action, Ecuador**

<http://edcnts2.cr.usgs.gov/gef/gef.asp?fipscode=628>

## **3.5 Newsletter**

**Climatic Alert Bulletin (BAC)** Within the framework of the ERFEN Program, the CPPS publishes the Climate Alert Bulletin (BAC, its abbreviation in Spanish). For further information link to: <http://www.cpps-int.org/english/bac.html>.

## **4 Calendar of Events**

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## **5 Professionals**

### **5.1 List of Technical Consultants**

To come

## **6 List of Institutions**

To come

## **7 Advertisements**

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