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[2003

Fisheries Management Act 1998**The National Beche-de-mer Fishery Management Plan**

I, **Honorable Andrew Baing M.P** Minister for Fisheries by virtue of the powers conferred by Section 28 of the *Fisheries Management Act 1998*, and all other powers me enabling set out the revised national bêche-de-mer fishery management plan. This plan supersedes the previous plan and takes effect from the date of notification in the National Gazette.

Background*Description of the Fishery*

The increasing demand for bêche-de-mer from Asian market and their over-exploitation in some of the neighboring Pacific Island Countries has caused the introduction of tough management regime to control the harvest of the fishery, but more importantly maintain resources sustainability.

In the pass only a handful of beche-de-mer species were considered most valuable, but rapid declined in abundance of these group in the last 20 years has led the less favoured species being harvested increasingly. Today there are currently 20 different species are being harvested commercially in PNG.

There has been a marked declined in the volume of high value species and an increase in the volume of the low value species taken. The opening of the market to new species that traditionally had no commercial value has dramatically impacted on the volume of export. Figures for 2000 showed PNG exported about 607mt valued about K16.2 million. Of that the low value species accounted for 61% (370mt) and high value species made up the remaining. In 2001 PNG exported 484mt value about K17.2 million and again the low value species accounted for more than 60% of the total export.

The price paid to fishers per unit (kina/kg) has also increased dramatically. Between 1980 and 1983, average beche-de-mer prices paid by buyers in PNG ranged from K2.34/kg to K3.36/kg; in 1985 they averaged K3.67/kg and K4.64/kg, in 1986. In 1994, prices paid to fishers in PNG were said to range from K1/kg to K12/kg, but sandfish were fetching from K12.19/kg in North Solomons Province to K18/kg in Manus Province, and white teat from North Solomons were selling for K30/kg (C grade) to K46/kg (A grade). The price paid by importers in 1994 ranged from K4/kg to K23/kg. In 2000, prices paid to fishers ranged from K3.50/kg for chalkfish to K60/kg for (A grade) sand fish; however, this increased to an average of K10/kg for chalkfish and K100/kg for A-grade sandfish in the 2001 season.

Despite its importance in terms of economics of PNG and cash income to some 200,000 fishers scattered in coastal villages, the fishery is not well studied. NFA is therefore envisaging conducting 2 to 3 provincial stock assessments annually. This will be done in partnership with reputable public or private institutions to conduct its research to update its information on growth, mortality, recruitment and movement patterns. These data are needed for estimate of yield and stock sizes required for the review of this plan.

Socio-economic studies pertaining the impact of the fishery on the communities is being considered, once the results of the community studies currently conducted in Milne Bay Province (Trobriand Islands) by NRI in collaboration with Australia Maritime Collage is encouraging.

Environmental impacts

The bêche-de-mer trade has had environmental impacts. In areas where product is smoked, mangrove stands may be deforested as firewood is gathered. Estimates have been made that ten tonnes of wood is needed to smoke 1 tonne of bêche-de-mer.

Sea cucumber processing also results in the production of stickwater, which contains a toxin (holothurine) that originates from the boiling of holothurian skin. In other countries, the release of stickwater directly into the marine environment has resulted in fish kills in shallow coastal areas.

Other potential environmental impacts of bêche-de-mer harvesting are poorly understood. All sea cucumbers extract bacteria and organic matter from bottom sediments and some are responsible for

bioperturbation and oxygenation of the sea floor. Consequently, intensive collection may cause changes to the condition and nature of seafloor sediments with unknown impacts on other resources.

1. Interpretation

In this Management Plan, unless the contrary intention applies;

“Maximum sustainable yield” means the highest possible catch of beche-de-mer that may be taken from the management area with minimum effect on the ability of the stock to continue to replenish itself.

“Precautionary Approach” means setting down restrictions to control harvesting in absence of adequate scientific data. These restrictions include setting of TAC, seasonal and area closure and control fishing efforts.

“National Management Advisory Committee (NMAC)” means an advisory committee established under this plan to provide advice for NFA.

“Provincial Management Advisory Committee (PMAC)” means an advisory committee established in the province to provide advice to NFA or NMAC on provincial specific issues.

“Sustainability” means ability for a resource to maintain its stock at a fishable level given a level of effort or harvest.

“Total Allowable Catch (TAC)” means the set amount of catch that is allowed to be taken out of the fishery in any one year or season. The TAC is set at a safe level based on the average annual production or on stock assessment work.

“Traditional Management Practices” means methods for conservation of marine and coastal resources practiced by traditional indigenous inhabitants, that have been passed down from generation to generation and which are not usually formally recorded.

2. Application

- a) This beche-de-mer fishery management plan is cited as “the Management Plan”.
- b) This Plan applies to all animals belonging to the Class Holothuroidea, commonly known as sea cucumbers, beche-de-mer, pislama or trepang.
- c) This Plan applies to the beche-de-mer fishery and includes all fishing and activities associated with the collection, processing, storage, buying, selling and exporting of beche-de-mer products.
- d) The Schedules to this Plan form part of the Management Plan and shall be read together with the management.
- e) This Plan is to be interpreted in accordance with clause 1 of this Plan, Section 2, Interpretation, *Fisheries Management Act 1998* and Part 1.1, Interpretation, *Fisheries Management Regulations 2000*.
- f) Otherwise express so words and expressions used in the management plan shall have same meanings as defined in the *Fisheries Management Act 1998* and *Fisheries Management Regulation 2000*.
- g) Where there is inconsistency between the Plan and *Fisheries Management Act 1998* and *Fisheries Management Regulation 2000* the *Fisheries Management Act* shall prevail.

3. Objectives

- a) To manage the fishery to the maximum economic benefit of Papua New Guinea.
- b) To ensure that the development of the beche-de-mer fishery benefits coastal communities, particularly customary fishers.
- c) To ensure use of the beche-de-mer resource is sustainable and that beche-de-mer fishing has minimal impact on the marine and coastal environment.

4. Precautionary Approach

Consistent with relevant international instruments including most common principles of the precautionary approach developed pursuant to The FAO Code of Conduct for Responsible Fisheries 1982 and management objectives of the Authority, precautionary approaches of management shall apply in respect of the species specified in this Plan in the following manner;

- (a) In the absence of adequate scientific data, NFA shall take into account any uncertainties with respect to the size and productivity of the stock, to other management references points such as maximum sustainable yield, the level and distribution of fishing mortality, and the impact of fishing activities on associated and dependent species, and including climatic, oceanic, environmental and socio-economic conditions.
- (b) In managing the beche-de-mer fishery, NFA shall consider the associated ecosystems on reefs within PNG. NFA shall develop data collection and research projects to assess the impact of fishing on non-target species and their environment, adopt plans as necessary to ensure the conservation of non target species and consider the protection of habitats of special concern.
- (c) The absence of adequate scientific information shall not be used as a reason for postponing or failing to take measures to protect the target and non-target species in each provincial beche-de-mer fishery.
- (d) The precautionary approach shall be based on the best scientific information available, including appropriate techniques and be aimed at setting stock specific minimum standards for conservation and management.
- (e) NFA shall, in collaboration with relevant persons and reputable organisations in PNG or the world, develop systems to collect data, and to undertake research into conservation of the stock and the protection of habitats.

5. National Management Arrangements

- a) The bêche-de-mer fishery will be managed nationally. A National Management Advisory Committee (NMAC) will be formed in accordance with clause (g) to provide advice to the Managing Director on the management of the bêche-de-mer fishery.
- b) The NMAC will provide advice to the Managing Director on management measures as the Managing Director may specify, including total allowable catches, closed seasons, reporting, restrictions, trade, and any other relevant issues that the Managing Director may direct from time to time. The final decision on the fishery management remains with the Managing Director.
- c) The NMAC may take on responsibility for advising on management of other marine species if directed to do so by the Managing Director or the Board.
- d) The Managing Director or the Minister may direct the NMAC to examine a particular issue in the fishery or to review all or part of the management plan.
- e) The plan will be reviewed by the NMAC at the direction of the Managing Director at least every three (3) years or at such earlier time as the Managing Director shall direct.
- f) Subject to prior approval of the board, any review of the management plan shall be made public by the NMAC and comments will be invited from all stakeholders in the fishery.
- g) The National Management Advisory Committee will consist of the following persons, appointed by the Managing Director:
 - i. two National Fisheries Authority (NFA) representatives (one will be appointed Chair)
 - ii. one fishery scientist
 - iii. two customary fisher representatives
 - iv. two fishing industry representatives nominated by the fishing industry
 - v. a representative from a non-government organization whose objectives include conservation of the marine environment and resources and;

- vi. one representative each from the Region Fisheries Secretariats for Southern, Momase and New Guinea Islands.
- h) No more than two members may represent groups or government from the same province.
- i) Elected political office holders are ineligible for membership of the NMAC. Should an NMAC member be elected to political office during their term he or she must resign their membership. Persons who nominate for provincial or national election shall stand down.
- j) The two representatives from NFA will serve as permanent members. Other members to the NMAC will serve for three-year terms. Representatives from Regional Secretariats will serve for one year and on rotational basis between provinces.
- k) The NMAC and its members will operate in accordance with the following procedures and such other procedures and standards as may be set by the Board:
 - i. a quorum requires two thirds of all members and must include one NFA representative;
 - ii. The Managing Director shall, with the endorsement of the Board lay down operational procedures for the NMAC, including place and dates for meeting and the NMAC shall meet at least once a year;
 - iii. prior to taking up membership, representatives will be required to disclose any direct or indirect personal or pecuniary interests in the fishery, otherwise than as a member of, and in common with the other members of, an incorporated company consisting of not less than 25 persons. The nature of his or her interest shall be disclosed as soon as possible to the NMAC. Such a disclosure shall be recorded in the minutes of the NMAC and submitted to the Managing Director;
 - iv. the NMAC and Managing Director must be advised of any substantive changes in such interests, or new such interests, during the course of membership. The Managing Director will determine if a change in interests will affect that member's term; and
 - v. where a member who has an interest described in subsection 5(k)(c), has not made a disclosure in accordance with that subsection, his or her vote shall be null and void retrospectively from the time such interest is considered and determined by the Managing Director and the Managing Director shall terminate the appointment of such a member.

6. Provincial Management Arrangements

- a) To ensure strong input from the Provinces, NFA will encourage provinces in the formation of Provincial Management Advisory Committees (PMACs).
- b) PMACs will advise the NMAC on Province-specific management arrangements.
- c) NFA will only recognise PMACs that comprise broad representation of marine resource users in the Province and the membership of each PMAC must include:
 - i. one representative from Provincial Administration;
 - ii. one District Administrator;
 - iii. three customary fisher representatives (from different Local Level Government areas);
 - iv. two local fishing industry representatives;
 - v. one NFA representative;
 - vi. provincial fisheries officer; and
 - vii. one representative from a non-government organization whose objectives include conservation of the marine environment and resources.
- d) The PMAC may submit a request to the NMAC, with justification, for members representing other stakeholder groups in the Province.
- e) The PMAC and its members will operate in accordance with the following procedures and such other procedures and standards as may be set by the Board:
 - i. the Chair of the PMAC will be voted in by a two thirds majority;
 - ii. a quorum requires any six members and must include one customary fisher representative, the Chair and an NFA representative;

- iii. the PMAC will meet as required, but, no less than twice a year.
- f) The Managing Director will determine, on the recommendation of the NMAC, if a PMAC will be represented on the NMAC. The composition of the PMAC will be the deciding factor. A PMAC must not include any elected political office holders from the national or Provincial Government or person nominated for such office.
- g) PMAC may be consulted on other fishery.
- h) The PMAC may in consultation with the Provincial Government develop a schedule to the National Bêche-de-mer Management Plan that covers province-specific management measures. The NMAC will endorse PMAC schedules for Board approval if they are consistent with the provisions of the management plan.

7. Management Measures

The following management measures set out in the management plan shall have the force of law upon notification in the National Gazette.

a) **Licensing**

i. **Licence Types**

- a) Under this plan the only licences required in the bêche-de-mer fishery will be export and storage facility licences.
- b) There is no limit to the number of export licences in any given province. However the PMAC of each province may recommend to NFA a specific number of export licences for the province based on the resources available.
- c) Export licences are not transferable.
- d) Licences are valid for one year and subject to renewal.

ii. **Licence Eligibility**

- a) The bêche-de-mer fishery is reserved for the use of citizens of Papua New Guinea.
- b) Only PNG citizens and PNG citizen enterprises may hold an export licence, or engage in any part of the bêche-de-mer fishery.
- c) Storage and trade of beche de-mer or/and beche-de-mer product are restricted to licensed operators only.

iii. **Licence Requirement**

- a) Licensed exporters will be required to provide returns (in the form on schedule 2) to NFA detailing all purchases made during the month. Failure to do so will result in export not being permitted.
- b) New or renewed export licensees will have to meet certain criteria set by the Managing Director with endorsement of the Board to qualify for an export license.
- c) Licences for the bêche-de-mer fishery will only be issued or renewed if the Board is satisfied that the company will meet, or has met, all licence conditions, and will comply, or has complied with the, provisions of the plan, *Fisheries Management Regulations 2000* and the *Fisheries Management Act 1998*, including any that may have prevailed prior to this plan.

b) **Total Allowable Catch (TAC)**

i. **TAC Allocation**

- a) Each Province will have an individual total allowable catch (TAC), applicable to a twelve month period, that is calculated using the best information available.
- b) The TAC will be divided into two groups: high value species and low value species. Schedule 1 sets out which species belong to each group. These will be referred to as value groups.
- c) The Managing Director, with the endorsement of the Board, will set TACs for the bêche-de-mer fishery in each Province. The NMAC will advise the Managing Director on TACs using information provided by NFA. TACs will be set after the yearly closure of

the fishery in each Province and prior to the opening of the fishery the following year. TACs for each province will be recorded in Schedule 4 to this Plan and once set shall not be changed until the following year.

ii. Monitoring

- a) NFA will monitor the total allowable catch for each value group in each Province.
- b) The NMAC will review the TACs for each Province annually taking into consideration any new and relevant research or information that is available.
- c) NFA will close the fishery on a date it estimates the entire TAC, or TAC of a value group, will be reached. This will be based on the best estimates of weight traded during the season.

iii. Penalty

If the allocated TAC for a Province is reached and exceeded by a considerable amount (more than 5mt), that excess amount will be taken off the next season's TAC.

c) Export Requirements

- i) Licensed exporters will only export bêche-de-mer of the sizes set out in Schedule 1 to this management plan.
- ii) Export of frozen beche-de-mer shall be consistent with the standards set out under section 13.3 of the Fish Quality Control (Export) Standards
- iii) Trade of undersized bêche-de-mer is prohibited and any undersized product will be confiscated and the licence may be revoked or cancelled.
- iv) The export of part or parts of, or broken bêche-de-mer, is prohibited.
- v) Parts of, or broken bêche-de-mer, weighing more than 40 kilograms found on export premises or packed for export will be confiscated and the export licence held may be revoked.
- vi) Bêche-de-mer product for export must be packed by species and the holding container clearly labelled with the name and quantity of the product and the name and licence number of the exporter.
- vii) Movement of bêche-de-mer product between Provinces is not permitted except with written authorisation from the Managing Director of NFA.
- viii) Where an exporter's nearest port for export is in another province, or is not functional, the company may apply for written authorisation, from the Managing Director of NFA, to use another port for export. If granted, such written authorisation shall:
 - a) be attached to the licence;
 - b) apply for one year only; and
 - c) be reviewed at the time the licence is renewed.
- ix) Samples for export shall be limited to 2 pieces of each species at any one time. Samples bound for overseas for personal consumption shall be limited to 2kg per person.

d) Prohibitions

- i) Non-citizens shall not take part in any aspect of the bêche-de-mer fishery. (Refer to G57 National Gazette 4th April 2002)
- ii) The use of hookah and SCUBA for the fishing of sea cucumbers is prohibited. (Refer to G57 National Gazette 4th April 2002)
- iii) The use of underwater lights or surface lights for the fishing of sea cucumbers is prohibited. (Refer to G57 National Gazette 4th April 2002)
- iv) Collection, buying, selling of all species of beche-de-mer is prohibited during the closed season or when a TAC is reached.
- v) Storage and trade of beche-de-mer or/and beche-de-mer products are restricted to licensed holders only.

e) Closure of the fishery

- i) NFA will close the fishery when the TAC is reached or the compulsory season closure date is reached, whichever occurs first.
- ii) A compulsory closed season will occur each year, from **1 October** until **15 January** of the following year, inclusive. The compulsory closed season applies to all Provinces.
- iii) If a fishery in one Province is closed early, other Provinces may continue to fish until their TAC is reached, or the season closure date is reached, whichever occurs first.
- iv) All collection, buying and selling of all species of bêche-de-mer will cease at the beginning of a closed season declared by NFA. Exceptions for export may be granted in writing by the Managing Director of NFA and such exceptions may be with conditions deemed approved by the Managing Director.
- v) NFA will advertise the closure of the fishery through national and local media, as approved by the Board.
- vi) On the fishery closure date, exporters must report holdings of bêche-de-mer product to NFA on the form set out in Schedule 3.
- vii) NFA may specify a date by which all holdings of beche-de-mer must be exported, or impose other measures for holding of product during the closed season.
- viii) NFA reserves the right to close any area of the fishery for conservation or regeneration purposes if it is considered necessary to do so for the sustainable management of the fishery

f) Reporting

- i) Standard trade names must be used in all reporting. These are set out in Schedule 1 to the Plan.
- ii) Licensed exporters must submit holding data to NFA on all bêche-de-mer product handled. This includes species composition, grades, ward of origin, supplier's name, weight in kilograms and any other information that NFA may deem necessary. The Ward names as in Schedule 5 should be used.
- iii) Monthly holding reports containing the information set out in Clause 7(f)(ii) must be submitted by the fifth (5) day of the following month on the form in Schedule 2 to this Plan.
- iv) Exporters shall declare all beche-de-mer products they intend to export on the form as in Schedule 2 of this plan to NFA, before NFA will issue approval for export and shall submit to NFA detailed proof of remittance.
- v) Five (5) working days after the closure of the fishery, export licensees must submit a report to NFA stating how much bêche-de-mer they hold at the start date of the closure set in Clause 7(e)(i). These will be submitted in the form set out in Schedule 3 to the Plan.
- vi) Failure to submit the required reports within ten (10) days, or submitting incorrect data, including incorrect trade names, may result in suspension or cancellation of the export licence under Sections 19 and 20 of the *Fisheries Management Regulations 2000*.

8. Specific Management Objectives

NFA will work with stakeholders in the bêche-de-mer fishery, non-government organisations and research institutions to carry out research and information-gathering activities to allow refinement of the Plan, particularly the conduct of resource surveys and assessments.

a) Stock Assessment and Fisheries Management activities aim to;

- i) Collect fishery data in a way that will test current assumptions of population abundance and productivity.
- ii) Sample specific areas according to the agreed sampling protocols to enable the collection of a time series of fishery-dependent information, which can be examined to determine harvest impacts within these areas. If need be, NFA will commission, or encourage research to identify negative environmental impacts to the bêche-de-mer industry in PNG, and develop mitigation methods against them.
- iii) Develop research and fishing protocols that will enable NFA and provinces to acquire the needed information for the fishery and aquaculture initiatives.

- iv) Collaborate with any reputable institution to conduct abundance surveys and test harvest rates. Where necessary the information made be made available to Provincial Governments and other relevant organisations to establish local programmes of fishery statistics collection.

b) *Aquaculture and Enhancement*

NFA recognizes the aquaculture industry as a legitimate user of PNG aquatic resources and will provide access to brood stock for industry development purposes (growth and diversification), and by aquaculture licence on an as-needed basis, subject to conservation and environmental requirements. Request to access the wild stock for development purpose must be supported by detailed project proposal by the proponent.

9. Customary Rights

- a) Existing customary management measures, which are consistent with this plan, are recognised by the NFA, and PMACs will be encouraged to notify NFA of such measures and incorporate these into their Provincial schedules.
- b) Customary open seasons that are inconsistent with closed seasons as set out in Clause 7(e)(i)&(ii) are prohibited under section 30 of the *Fisheries Management Act 1998*.

SCHEDULE 1**Value Groups, Trade Names and Minimum Size Restrictions****Value Group H - High Grade Species**

	Trade Name	Scientific Name	Alternative Names	Live Length (cm)	Dry Length (cm)
1	Sandfish	<i>Holothuria scabra</i>	Golden sandfish	22	10
2	Black teatfish	<i>H. nobilis</i>	Black mama	22	10
3	White teatfish	<i>H. fuscogilva</i>		35	15
4	Greenfish	<i>Stichopus chloronotus</i>		20	10
5	Prickly redfish	<i>Thelenota ananas</i>		25	15
6	Surf redfish	<i>Actinopyga mauritiana</i>	Rough surf	(20)	(8)
7	Blackfish	<i>A. miliaris</i>	Big blackfish	15	10
8	Curryfish	<i>Stichopus hernanni</i>		25	10
9	Stonefish	<i>Actinopyga lecanora</i>		15	10
10	Tigerfish	<i>Bohadschia argus</i>	Leopard fish	20	10
11	Brown sandfish	<i>B. vitiensis</i>	PK fish	20	10

Value Group L - Low Grade Species

	Trade Name	Scientific Name	Alternative name	Live Length (cm)	Dry Length (cm)
1	Amber fish	<i>Thelenota anax</i>	Giant bêche-de-mer	20	10
2	Lollyfish	<i>Holothuria atra</i>	Biglolly	(30)	(15)
3	Chalk fish	<i>Bohadschia similis</i>	False teatfish	(25)	(7)
4	Elephant trunkfish	<i>Holothuria fuscopuntata</i>	Trunkfish	(45)	(15)
5	Pink fish	<i>H. edulis</i>	Smallbelly	(25)	(10)
6	Snake fish	<i>H. coluber</i>			
7	Flower fish	<i>Pearsonothuria graeffei</i>	lollyrough, butterfly fish		
8	Deepwater red fish	<i>Actinopyga echinites</i>		(25)	(15)

Note: Figures in the brackets are provisional estimates only. NFA endeavors to update this value once new information is made available.

**NATIONAL FISHERIES AUTHORITY****SCHEDULE 2****Monthly Buying Summary Report**

This form should report all marine product bought within a month

Name of Exporter:

Month/Year:

Export Licence NO:

Province:

Product Type:

Species NFA trade names	Dry Weight kilograms	Supplier first name and last name	<u>Ward</u> where bdm was collected

Send or Fax form to:

Facsimile: (675) 3202069
Telephone: (675) 3090444
Email: nfa@fisheries.gov.pg

Manager,
Licensing & Information
P O Box 2016
PORT MORESBY
Papua New Guinea



NATIONAL FISHERIES AUTHORITY

SCHEDULE 3**End of Season Holding Report**

This form should report all marine product held at the close of a season

Name of Exporter:

Month/Year:

Export Licence N0:

Province:

Product Type:

Species One per line. NFA trade names	Dry Weight kilograms	Species One per line. NFA trade names	Dry Weight kilograms

Send or Fax form to:

Facsimile: (675) 3202069
Telephone: (675) 3090444
Email: nfa@fisheries.gov.pg

Manager,
Licensing & Information
P O Box 2016
PORT MORESBY
Papua New Guinea

SCHEDULE 4**Total Allowable Catch for each Province**

Province	High Value Species (tonnes)	Low Value Species (tonnes)	Total TAC (tonnes)
Bougainville	20	40	60
Gulf	(0.5)	(0.5)	(1)
East New Britain	10	20	30
East Sepik	7	13	20
Madang	15	25	40
Milne Bay	60	80	140
Manus	18	32	50
Morobe	10	20	30
NCD & Central	(25)	(55)	(80)
New Ireland	25	55	80
Oro	15	25	40
West New Britain	20	40	60
West Sepik	7	13	20
Western	10	7	17
	242.5	425.5	668

Note: Figures in the brackets are provisiona' estimates only.

SCHEDULE 5**NAMES OF WARD AREAS IN EACH PROVINCE**

<p>MANUS PROVINCE</p> <p>Aua Wuvulu LLG Auna 1 Auna 2 Onnei 1 Onnei 2 Aua Island 1 Aua Island 2</p> <p>Nigoherm LLG Pateku Lau Island Pihon Liot Luf Amik</p> <p>Bisikani/Soparibeu LLG Salien Nihon Kali Maso Matahai Salapai Lessau Harengan Jowan 1 Jowan 2 Nyada Levei Sori 1 Sori 2</p> <p>Pomuuu/ Kurti/Andra LLG Ponari Tulu 1 Tulu 2 Lapahan Bundralis C/Mission Lehewa Saha Ndrehet Liap Derembat Andra Island Sou</p> <p>Lelemadih/Bupichupeu LLG Malabang Horan Powat Maraman Lapahan Ndrakot Lowa Ahus Yiringou Powat 1 Dungcinmasi Pitylui Ndrilou</p> <p>Lorengau Urban LLG Lorengau Urban</p>	<p>Los Negros LLG Loni Lolak Lombrum Papitalai Naringel Riuri Salamei resettlement Mokoreng Lombrum Naval Base</p> <p>Nali Sopat/Penabu LLG Lawes Nohang Katir Lowaiya Lapap Lahan Maleh Mbunai Pere Patusi</p> <p>Tetidu LLG Londru</p> <p>Pobuma LLG Mbuke/Wal Bundrahei/Sapondralis Likum Babun Timoenai Pohowai/Deyaha Peli Patu</p> <p>Balopa LLG Mouk Lipan Sone Paroi Buiat Baon Solang Rei Lako</p> <p>Rapatona LLG Mokarah Hahai Tong Nauna Polobuli Kuluo Penchal Lengau Mouklen</p> <p>NEW IRELAND PROVINCE</p> <p>Murat Rural LLG Tasitel Magien Lolieng Palakau Emirau Tench</p>	<p>Lovongai Rural LLG Taskul Patiagaga Patipai Ungakum Tsoi Tukulisava Ungalik Meterankasing Noipuas Sosson Umbukul Kone Meteselen Tioputuk Lovongai Meterankang Lungatan Kulingei</p> <p>Tikana Rural LLG Enang Nonovaul Panapai Kaselok Bagatare Lokono Ngavalus Paruai Lemakot Panamana Madina Kafkaf Namasalang Belifu Pangeifua Lamusmus Leon Lapai Lakurumau</p> <p>Kaveing Urban LLG Bagail Kulangit Maiom Kavieng</p> <p>Namatanai Rural LLG Palabong Kabanut Matakan Bureau Rasirik Labur Loloba Kanapit Pire Namatanai Salimun Bisapu Sopau Rativis Hibaling Himau</p>
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<p>Nokon Hipakāt Kembeng Sena Namatanai Urban</p> <p>Sentral Niu Ailan Rural LLG Simberi Tatau Datava Mapua Wang Tandis Lossu Konos Kimadan Lelet Dalom Lemeris Bulu Karu Komaiu Komaiabuo Danu Messi Ugana Lamau Patlangat Panaras</p> <p>Konoagil Rural LLG Rei Kamiang Morkon Kamilal Bakum Pukunmal Matkamlagir Beriotar Bakok Lambom Lamassa Kabaman Kait Watpi Tampakar Siaman</p> <p>Tanir Rural LLG Taonsip Fonli Kominasaeo Amfar Sungkin Put Nonu Lif Tefa Naton Basakala Balankolen Kamgot Balangat</p> <p>Nimamar Rural LLG Londolovit Putput Matakues Lataul</p>	<p>Komat Pangoh Wurtol Samo Lambuar Kosmaiun Kunaie Malie Malal Ton Mahur Londolovit Township</p> <p>WEST NEW BRITAIN PROVINCE Gasmata Rural LLG Amio Poronga Tesopol Akolet Aikon Kasuio Asirim</p> <p>Glouster Rural LLG Aumo Aisege Somate Kilenge Airagilpua Gakui Alaido Gurrisi</p> <p>Kandrian Coastal Rural LLG Amnge Apalik Aeglip Kandrian Kaul Loko Nambis Ioudo Vinum Pililio Agulo Ivanga Naplavui Kandrian Urban</p> <p>Kove/ Kaliai Rural LLG Kakota Talasea Poitala Kalmaruhi Sisili Apulo Mongamonga Akiivilik Lusi Anemsahe Aria No 1 Aria No 2 Mouk Lamogai</p> <p>Bialla Rural LLG Bialla Noau Ubili</p>	<p>Navo Lolobau Kabaia Barema Wilelo Apupul Bialla 2 Tiauru Sale/Malasi Sale/Sege Uasilau Silanga Pasusu Ubai/Bilomi Mangseng Bialla Urban</p> <p>Bali/Witu Rural LLG Penata Garomatong Kumburi Lovanua Mundua</p> <p>West Garove East Garove</p> <p>Hoskins Rural LLG Garua Kwalakesi Hoskins Kalu Valola Rikau/Siki Kagagu Malala Pokili Hoskins Urban Buluma Urban</p> <p>Kimbe Urban LLG Kimbe Urban</p> <p>Talasea Rural LLG Nalabu Boge Gabuna Bola Warou Tabekemei Bulu Valupai Baliendo Bunga</p> <p>EAST NEW BRITAIN PROVINCE Central Gazelle Rural LLG Tavilo Settlement</p> <p>Lassul Baining Rural LLG Poniar/Kanako Takis Nangas Traiwara Lassul Puktas Matanakunai</p>
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Mandrambit Wilambemki/Poiniara Panarapka Navui/Mampit Open Bay Timbers Watmetki Morokindam Mobisberg Plantation Livuan/Reimber Rural LLG Rababat Vunaioto Kabakada Toboina Putanagororoi Vunalir Ratongor Vunadawai Lungalunga Mailivuan Volavolo Bitapaka Rural LLG Londip Ganai Menebonbon Korai Kamakamar Rainau Malakuna Duke Of York Rural LLG Makada Molot Maren Butlivuan Waira Nabual Inolo Kabilomo Urakukur Kababiai Mualim Virian Palpai Utuan Karawara Kokopo/Vunamami Urban LLG Karavi Vunamami Kabakaul Takubar Vunapope Kokopo Raluana Rural LLG Raburua Bitatita Nguvalian Raluana Barovon Ialakua Vunatagia Ralalar Central/ Inland Pomio LLG Malakur Baian (west)	Galewa Pomio Sali Tokai Matong Buka Pulpul East Pomio Rural LLG Lamarain Long Kaukum Milim Guma Klampun Sampun Waswas Bain Raolman Melkoi Rural LLG Makmak Tavolo Meletong Uvol Inahele Ruachana Mininga Maso Mainge Atu Sinivit Rural LLG Marabu Lat Gar Merai Ili Karong Sunam Marunga Tol West Pomio/ Mamusi Rural LLG Malmal Manginuna Totonpal Kaiton Poro/Salei Kangelona Mauna Lau Bairaman Tolei Balanataman Rural LLG Ratung Pilapila Karavia Ratavul Volavolo Nonga Tavui No.1 Tavui No.2 Tavui No.3 Malaguna No.1 Malaguna No.2 Malaguna No.3 Iawakaka	Rapolo Tavana Valaur Nonga Base Kombiu Rural LLG Baai Nodup Matalau Rakumat Rabuada Korere 1 Korere 2 Talvat Matupit 1 Matupit 2 Matupit 3 Matupit 4 Matupit 5 Rabaul Urban LLG Rabaul Town Watom Island Rural LLG Rakival Taranata Valaur Vunabuk Vunakabai NORTH SOLOMON PROVINCE Tinputz LLG Tinputz Teop Taonita Kunua LLG Islands Hahon Rapois Kereaka Selau/ Suir LLG Sorom Hantao Siara Rapoma Suir Inland Buka LLG Tsitalato Hagogohe Halia Haku Tonsu Buka Urban Nissan LLG Sigon Pinepel Attols LLG Carterets Tasman Mortlock Nuguria
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Wakunai LLG Assigoro Bohi Ewara/Papana Arawa LLG Kokoda Torau Bava Pirung Apiatei South Nasioi Iroro 1 Iroro 2 Pinei-Nari Awara Urban Buin LLG Baubake Konnou Makis Lenoke Killerton Otobejari Konje Siwai LLG Ruhwaku Hari Torokina LLG Burue Goorei NORTHERN PROVINCE Oro Bay Rural LLG Sarir Gunimba Jegerakambo Emo Banderi Waiwa Beama Baberada Dombada Hanakiro Kararata Dobuduru Barisari Siremi Buna Kausada Jinanga Bakubari Batari Oure Aure Dewatutu Bindari Cape Nelson Rural LLG Kewansasap Marua Uiaku Ganjiga Rainu Koreaf Ajoa	Itoto Giriwa Managa Jebo Baga Kwave Sefoa Sinei Berebona 1 & 2 Ako Foru Karaisa Kinjaki Guruguru Embesa Tufi Govt. Station Tamata Rural LLG Hurata Oita Tandi Kikinona Korisata Utukiari Kurereda Jino Sia Manau Deboin Kotaure Tubi Ainsi Nindewari Ewore Bovera Tave GULF PROVINCE East Kerema Rural LLG Lelefiru Kukipi Uritai Popo Lese Miaru Iokea Sarota WESTERN PROVINCE Daru Urban LLG Daru Kiwai Rural LLG Sigabaduru Mabudawan Tureture Sui Severimabu Doumori Buji Mawatta Parama Wabada Kadawa Katatai NATIONAL CAPITAL DISTRICT Boroko/Kororosea Urban Taurama Beach Smnt	Vadavada Smnt Tutu Kilakila 3 Smnt Kilakila Village Pari Village Daugo Lata Kilakila/Kaugere Urban Horse Camp Smnt- Evedaha Horse Camp Smnt-Gimaune Kk Horse Camp Smnt-Evedaha Sabama Smnt Kilakila Vabukori Village Taikone Village Gabutu Heights Laloki/Napanapa Daugo Island Borehoho/Gabidaha Koukou Smnt MOROBE PROVINCE Kotte Rural LLG Wareo Fior Maruruo Jivewaneng Siki Heldsbach Yabim Mape Rural LLG Kolem Godowa Bugaium Nasingalatu Logaweng Kwalansam Kasanga Samanai Busiga Wanam Bukawasip Tigidu Finschafen Station Samantiki Macwaneng Embewaneng Mangac Kangaruo Haponhongdong Morobe Rural LLG Kui Paiawa Miana Zinamba Igori Amoa Bisadi Mou Ana Eware Kobo Eiya Wuwu Dona Ainse Zare
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<p>Siu Popoe Bau Morobe Station</p> <p>Salamaua Rural LLG Hote Yemly Bobodum Selebob Kamiatum Mubo Lababia Salus Buansing Laukanu Laugui Keila Murusapa Asini Buakap Lutu E Usama Awasa Busama Abubu</p> <p>Labuta Rural LLG Labuta Tamigidu Boac Buingim Ee'c Wideru Bukawa Mundala Yambo Buhalu Waganluhu Apo Musom/Tale Situm Momolili</p> <p>Sialum Rural LLG Gitua Kumukio Sialun Gitukia Kukuya Kangkau Rua Nunze Ririwo Karak Zankoa Walingai Rebafu Zongefifi Zunzumau</p> <p>Siassi Rural LLG Bon Masele Aimalu Pandamot Opae Bunsil Aronae Malai Tuam Mandok</p>	<p>Giam Gune Lablab 1 Marile Mabey Movi</p> <p>Wasu Rural LLG Yakawa Sio 2 Sio 1 Kulavi Wasu Kiari Weleki Towat Welowelo Singorokai Roinji Hongo Satop Wawet Domut Belombibi Karangan Nanaya</p> <p>MADANG PROVINCE Almami Rural LLG Ambana Dagui Gawat Wangor Suaru Pariakanam Turutapa Urumarav Milalimuda Aidibal Turupuav Wadaginam Sereken Wagimuda Yawera Yakiba Mugumat Yoro Suvat Dukumor Busip Kalelap Simbine Malala Wakor Amiten Aketa Aleswaw Manuga Gugubar Erewanem Ulatapun Tarikapa Muaka Korak Ulingan Toto Medebur Mereman</p> <p>Iabu Rural LLG Baliau Dangale</p>	<p>Kolang Bikure Abaria Warisi Dugulaba Budua Madauri Waia Zogari Iassa Kuluguma Boda Boisa</p> <p>Yawar Rural LLG Marangis Kayan Boroi Buliva. Daiden Dongan Awar Nubia Birap Rugusk Ambu Sepa Rugusak Banag Giri Tung Damangap Kumnung Minung Korak Mikarep Abegini Dinam Adui Apengan Ariangon Amber Arep Aringen Gun Dimuk Sirin Giar Wazamb Andeamarup Duapmung Andarum Ward Thirty Three Baritumbo Kayoma Bang Wokam Sanai Taringi Naupi Gwaia Akurai</p> <p>Ambenob Rural LLG Ward 2 Ward 3 Ward 4 Ward 5 Ward 6 Ward 7 Ward 8 Ward 9 Ward 10 Ward 11 Ward 12 Ward 13 Ward 14 Ward 15</p>
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Ward 16	Ward 3	Smain/But
Ward 17	Ward 4	Lowan
Ward 18	Ward 5	Kauk/Balam
Ward 19	Ward 6	Sowon
Ward 20	Ward 7	
Ward 21	Ward 8	Turubu Rural LLG
Ward 22	Ward 9	Mandi
Ward 23	Ward 10	Forok
Madang Urban	Ward 11	Kep
	Ward 12	Suanum
Madang Urban LLG	Ward 13	Samap
Madang Urban	Ward 14	Bungain
	Ward 15	Sinamblai
Astroiabe Bay Rural LLG	Ward 16	Manuwara
Ward 1	Ward 17	Sir
Ward 2	Ward 18	Putanda
Ward 3	Ward 19	Parpur
Ward 4	Ward 20	
Ward 5	Ward 21	Wewak Islands Rural LLG
Ward 6	Ward 22	Biem 1
Ward 7	Ward 23	Biem 2
Ward 8	Ward 24	Kadowar
Ward 9	Ward 25	Ruprup 1
Ward 10	Ward 26	Ruprup 2
Ward 11	Ward 27	Wei
Ward 12	Ward 28	Koil 1
Ward 13	Ward 29	Koil 2
Ward 14	Ward 30	Vokeo 1
Ward 15	Ward 31	Vokeo 2
	Ward 32	Koragur 1
Rai Coast Rural LLG	Ward 33	Koragur 2
Ward 1		Shagur
Ward 2	EAST SEPIK PROVINCE	Rumlal
Ward 3	Marienberg Rural LLG	Seresing
Ward 4	Kis	Brauniek
Ward 5	Kaup	Mushu 1
Ward 6	Murik	Mushu 2
Ward 7	Darapap	Walis 1
Ward 8	Karau	Walis 2
Ward 9	Mendam	Tarawai
Ward 10	Bin	
Ward 11	Suk	Wewak Urban LLG
Ward 12	Imbando	Wewak town
Ward 13	Mamber	
Ward 14	Watam	WEST SEPIK PROVINCE
Ward 15	Kopar	East Aitape Rural LLG
Ward 16	Mabuk	Poltulul
Ward 17	Gapun	Tales-Lambu
Ward 18	Arango	Tumeleo Island
Ward 19	Ombos	Ali Island
Ward 20	Oramai	Seleo Island
Ward 21	Jangit	Poro Settlement
Ward 22	Manimong	Lupai
Ward 23	Murken	Wauningi
Ward 24	Pokran	Pes
Ward 25	Jeta	Prou/Vokau
Ward 26	Binam	Lemieng
Ward 27	Pangin	Chinapeli
Ward 28		Kiriell-Kopom
Ward 37	Boikin/Dagua Rural LLG	Paup
Ward 38	Boikin	Yakamul 1
Ward 39	Karawap	Yakamul 2
Ward 40	Yuwo	Ulau 1
Ward 41	Karasau Est	Ulau 2
Ward 42	Banak/Hogi	Suain
	Bogumatai/Wautogi	Labuain
Karkar Rural LLG	Dogur	Womsis
Ward 1	Urip	Balup
Ward 2	Makopin	Matapau
	Maguer	

<p><i>Aitape Urban</i></p> <p>West Aitape Rural LLG</p> <p>Nimas Mainy (Sissano) Mainy on (Sissano) Paupa Arop 1 Arop 2 Mainyen Tanyapin Aipokon Nengian Koiniri Walwale Romei Barera Kaiye Mafoka Mori Mumuru Sumo Ramo Pou Sarai Rainuk Amsuku</p> <p>Bewani/Wutung Onei Rural LLG</p> <p>Wutur Musu Yaukono Yako Warimo Vanimo (Lido) Ningra Rawo Poko Nowake Laitre Puare Onei Osol Krisa Ossima</p> <p>Vanimo Urban LLG</p> <p>Vanimo Town</p> <p>CENTRAL PROVINCE</p> <p>Amazon Bay Rural LLG</p> <p>Aloke/Nonou Daena/Warumana Malaoro/Kenene Dorio/Bua Dagaea Oro/Abati Danava/Goiseoro Barauoro Ade/Edu Launoga Banaco Losoa/Bogia</p> <p>Aroma Rural LLG</p> <p>Paramana Pelagai Maopa</p>	<p>Gaivakalama Waro/Iruone Kelekapan Wairavanua Kelerakwa Waiori Wanigela Gavuone Kapari Lalaura Kupiano Urban</p> <p>Cloudy Bay Rural LLG</p> <p>Boru Doma Robinson River Si'ini Duramu Ganai Amau Ianu Damara Baramata Tutubu Merani Manabo Dom Moreguina Urban</p> <p>Hiri Rural LLG</p> <p>Poredaba Papa Roku Lealea Kido Manumanu Barakau Tubusereia Mt. Diamonc Gaire Dagoda Akuku Laloki Vanapa Brown River Kerea Boteka</p> <p>Kairuku Rural LLG</p> <p>Kivori Waima Abiara Waima/ Kore Delena Nabuapaka Chiria Abiara Biotou Rapa Mou Babiko Nara Hisiu Gabadi/Pinu Malati Veimauri Bereina Urban</p>	<p>Rigo Coastal Rural LLG</p> <p>Gabagaba Ginigolo Gunugau Tagana Gabone Tauruba Bonanamo Kemabolo Galomarupu Walai Babagarupu Riwalirupu Gemo Kararoko Irupara Hula Babaka Kamali Kalo Makerupu Alukuni Karawa</p> <p>MILNE BAY PROVINCE</p> <p>Makamaka Rural LLG</p> <p>Bai'awa Midino Iarame Pem Magabara Tapio Mukawa Bogaboga Ginada Irikaba Wabubu Dabora Banapa Menabi Pora Abuaro Giwa Koiyabagira Kwagila Biniguni Wapon Borovia Pumani Bemberi Gurukwaia Mapouna</p> <p>Daga Rural LLG</p> <p>Gaunani Birat Bonenau Param Kakaia Payawa Ilakae Uni Bibitan Danawan Biman Gwagut Gwadede Veiauwa</p>
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<p>Gwaira Kanuturu Gauwa Gwiroro</p> <p>Weraura Rural LLG Divari Kwabunaki Rumaruma Damaladona Wedau Manudaba Vidia Radava Gadoa Wadobuna Nakara Uga Augwana Sirisiri Taramugu Ikara Taubadi Bidiesi Awawa Dombosaina Warawadidi Bowadi Danobu Karagautu Wanama Boyaboya Gadovisu Didia Mainawa Pova</p> <p>Maramatana Rural LLG Lavora Topura Iapoa 1 Wamawamana Taupota Garuah Awaiama Keia Iapoa 2 Polotcna Huhura Guga Wagohuhu Biwa Ibulai Ronana East Cape Iabam/Pahilele Nuakata</p> <p>Huhu Rural LLG Mutuyuwa Divinai Daio Rabe Yaneyanene Siasiada Gibara Lamhaga Lelehudi Watunou Nigila</p>	<p>Ahioma Weama Gabugabuna Maiwara Naura Gelamalaia Gamadoudou Wagawaga Gwavili Upper Dawadawa Bubuleta Walalaia Bou Ipouli Kilakilana Borowai Laviam Lower Dawadawa Hagita Estate</p> <p>Suau Rural LLG Koukou Iloilo Bonarua Modewa Baibaisiga Suau Island Sibalai Ipulai Savalala Navabu Isuae Savaia Oyamamania Isudiudiu Saga'aho Isuisu Isudau Seasea (south) Seasea (north) Silosilo Kaukau Bonabona Island Dahuni Leileiafa Sueiabina Gadaisu Wadauda Boilave Takwatakwa</p> <p>Alotau Urban LLG Alotau Town</p> <p>Bwanabwana Rural LLG Hamama Loani Logea Kwato Tegerauna Gotai Dawson Samarai East Kwaraiwa Sauwasauwaga Anagusa Samarai North Tubetube</p>	<p>Yokowa Gigia Habani Simagai Ware Island Beaudna Sideia Kuiaro Sekuku Sidudu</p> <p>Louisiade Rural LLG Mwabua Narian Bwagaoia Hinauta Kaubwaga Boiou Siagara East Siagara West Gulewa Liak East Liak West Bagilina Ewena Edora Bwagabwaga Awaibi Alhoga Eaus North Eaus South Gaibobo Kimuta West Panaeati East Panaeati Panapompom Brooker Motorina North Motorina South Bagaman Panaumara Baimatana Lobwa Bwana</p> <p>Yaleyemba Rural LLG Sabara Grass Island Nimoa Western Point Gringgin Point Rambuso Rehuwa Madaua Jelewaga Damunu Morpa Wulunga Bay Jinjo Abeleti N'jaru Buwo Pambwa</p> <p>Murua Rural LLG Kulumandau Guasopa Wabununa Kavatana</p>
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<p>Iwa Unumatana Budibudi Ianabai Gawa Island Kauwai Madau Dikoias Kwaiwatta Muneiveyova Oyavata Alcester</p> <p>Kiriwina Rural LLG</p> <p>Kaibola Mwatawa Tubowada Daiagual Liluta Kwaibwaga Omarakana Kabwaku Okaikoda Yalumgwa Kuruwitu Yalaka Wabutuma Botalu Gumilababa Kapwapu Kavataria Mulosaida Okaiboma Ilalima Obulaku Sinaketa Oiveyova Tukwajukwa Loya Vakuti Kumwagea Lalela Okabulula Kaduwaga Koma Kuyawa Simsimla</p> <p>Goodenough Island Rural LLG</p> <p>Waibula Ufaufa Watuluma South Watuluma North Idakamenai Ulutuya Wakonai Vivigani</p>	<p>Eveli Kalauna Belebele Malaita West Malaita East Faivava Ufufu Bwadoga East Bwadoga West Wagifu Abolu Kilia Lauwela Awale Utalo Diodio Yauyaula Awaia Ibawana Kalimutabotabo</p> <p>West Ferguson Rural LLG</p> <p>Fayayana Ailuluai Ukeokeo Toagesi Igwageta Kukuya Ibwananiu Mapamoiwa Fagululu Iamalele North Iamalele South Gewata Saibutu Niubuo Ebadidi Tutubea Bwayobwayo Masimasi Gwabegwabo Atugamwana Agealuma Didiau Kalokalo Fatavi Iaupolu Kaurai</p> <p>Dobu Rural LLG</p> <p>Maiabari Bwakera Koruwea Yo'o Taulu Sisiana</p>	<p>Miadeba Darubia Kenaia Buduwagula Nade Si'ilugu Wesoiliwe Galubwa Neboluwa Salamo Gomwa Begasi Du'una Daguiara Deidei Bwaiowa Sawa'edi Waluma West Sebutuia Momoawa Basima Urua Gameta Duduna Wadalei Bosalewa Gumawana</p> <p>Sanaroa Duau Rural LLG</p> <p>Kelologea Sawatupwa Mwatebu Sewateatea Lomitawa Sipupu Weyoko Maudana Kwanaula Loboda Siausi Dawada Sigasiga Sapisapia Biauwa Somwadina Mwalakwasia Kasikasi Kumwarau Kalotau Barabara Bunama Gudumuli Isumainai Pwabapwana Sibonai Bwasiyaiyai Kurada</p>
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Approved this.....th.....day of.....2003

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HON. ANDREW BAING MP
MINISTER FOR FISHERIES



NATIONAL FISHERIES AUTHORITY

Fisheries Management Act 1998

NATIONAL SHARK LONGLINE MANAGEMENT PLAN

2002

This National Shark Longline Management Plan is drawn-up pursuant to the Fisheries Management Act 1998, and shall supercede all previous plans upon coming into on gazettal in the National Gazette.

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Background

Description of the Fishery

Commercial gillnet-based shark fisheries, mostly in the Gulf of Papua, commenced in the early 1980s, but ceased in the late 1980s due to decreasing catch rates and controls on drift net fishing. Following the closure, shark fishing was primarily carried out on a small scale by local communities and artisanal fishers. There was no officially sanctioned commercial shark fishery in Papua New Guinea (PNG) other than this operation. A trial shark fishery commenced in the early 1990s, targeting deep bottom sharks for their liver oil. The trial shark fishery ended in 1994.

Shark is also taken as by-catch in industrial fisheries such as the tuna longline and prawn trawl. However, since 1996, the deliberate targeting of shark by some freezer vessels provisionally issued with tuna longline fishing licences has increased. Declared total exports of shark products grew from about 20mt, processed weight (dried fins and dressed frozen) in 1990 to almost 2,000mt in 2000. Shark meat, oil and fins (frozen and dried) have been the primary products exported. The exports of shark oil however ceased in the early 1990s, as noted. The shark oil production peaked in 1992 with a volume of 20.73mt worth K1,030,277.39.

Shark meat and shark fins are the only shark products currently exported. Shark meat volume increased from 18mt in 1990, worth K16,000, to 1,685mt in 2000, worth K2.3 million. Frozen shark fin exports increased from 1.2 mt in 1991, worth K1,400, to 134.4mt in 2001, worth K3.7 million. Dried shark fin exports increased from 0.006 mt in 1991, worth K57.00 to 10mt, worth K1.6 million, in year 2000.

The increase in production has largely been the result of increasing prices paid for shark products in Asia and the ease with which some of the shark products (eg, dried sharkfins) can be processed and transported for export.

The high price offered for the shark products resulted in the increased unregulated fishing for sharks by the licensed tuna longline vessels, which subsequently prompted the National Fisheries Authority (NFA) to consider the introduction of a Shark Management Plan in mid February, 2001.

The NFA has since then developed this proposed plan, which recognizes shark fishing as a legitimate fishery if managed on a sustainable basis. The Plan is specific to shark longlining involving the use of freezer vessels, which is the method currently used in the directed shark fishery, but recognizes that other fisheries targeting shark may come under the jurisdiction of the Plan if and when they develop.

The Plan allows for the fishery to be gradually phased down to a sustainable level using a formula of two vessels being withdrawn after the first year from the gazettal date of this plan. A review after the end of second year from gazettal date will determine the future of the Plan. The reason for this is that a significant amount of shark is taken by tuna longline vessels as bycatch and increases in the number of tuna longline vessels, associated with implementation of the PNG tuna domestication policy, will inevitably result in increased bycatch of sharks, of the order of 20% of the total catch of each vessel.

This plan is complementary to the National Tuna Management Plan, which sets out limits for shark bycatch in the tuna longline fishery.

Management considerations

The main shark species harvested in Papua New Guinea waters, belong to the families Carcharhinidae, Pristiidae and Squalidae. As a result of their slow growth rates, long gestation periods, low fecundity, and localised movement, sharks are of particular management concern. Previous commercial shark fisheries have experienced boom and bust cycles due to over-harvesting, often with the fishery ending in an abrupt population crash. Most sharks are top predators and their role in the marine environment is not well understood, although it is clear that over-fishing of sharks may result in an imbalance in marine ecosystems.

There is growing regional and international concern about the conservation of shark populations and moves to limit shark fishing are increasing. Environmental groups are actively campaigning against consumers and producers of shark products, and some countries including the US have legislated against shark finning practices. In line with the Food and Agriculture Organization's (FAO) International Plan of Action for Sharks (IPOA), PNG is required to actively manage the shark fishery to ensure that the resource is harvested on a sustainable basis and that benefits from the important coastal and reef-associated sharks can accrue to users such as the dive operators and some rural communities, for other than fishery purposes. The proper management of the shark fishery would minimize negative perceptions that may tarnish the reputation of other Papua New Guinean fish products or bring the longline industry to a halt.

Terms used

In this Management Plan, unless contrary intentions implies;

Surface longline	fishing method that has a mainline suspended horizontally in the water column, floating or attached to a vessel and the gear retrieved by hand or mechanical means, and from which branch lines with hooks are attached.
Bottom longline	fishing method that has a mainline that lays on the bottom or is suspended near the sea bottom for the majority of its length, whether retrieved by hand or mechanical means, and from which branch lines with hooks are attached.
Emergent reef	ridge of rock or coral etc. at or near the surface of the sea that is known or mapped or would be known upon investigation.
Sharkfin	<p>fins of a shark prepared for commercial sale, which are;</p> <ol style="list-style-type: none"> i) Anal fin, which is the fin on the lower body of the fish close to the anus ii) Caudal fin, which is the fin at the tail end of the fish iii) Pectoral fins, which are the fins on the ventral (lower) side of the fish iv) Dorsal fins, which are the fins on the dorsal (upper) side of the fish v) Lower caudal fin, which is the lower lobe on the tail end of the fish

Carcass	dead body of an animal (shark in this case)
Trunk	body of a shark with the head, fins and stomach removed.
Dressed weight	weight of the trunk, representing about 60% of the whole weight.
Whole weight	weight of the shark with all body parts intact.
Total Allowable Catch (TAC)	total amount of catch by weight specified as allowed to be harvested per year. It can be either whole weight or dressed weight.
Leader or trace material	section of the branch line that connects the branch line and the hook.

1. Application

- a) This National Shark Longline Management Plan shall be cited as “the Plan”.
- b) This Plan applies to all animals belonging to the Class Chondrichthyes, commonly known as sharks and rays
- c) This Plan applies to the shark longline fishery and includes fishing and all other activities associated with the collection, processing, storage, buying, selling and exporting of shark products originating from the shark longline fishery.
- d) The Schedules to this plan are an integral part of the management plan.
- e) This Plan is to be interpreted in accordance with Fisheries Management Act 1998 and the Fisheries Management Regulations 2000 and where there is inconsistency between this plan and the Act prevails.

2. Objectives

- a) To apply a precautionary approach to the management of the shark fishery, ensuring the harvest of shark resources is sustainable and that shark fishing has minimal impact on the marine ecosystem.
- b) To ensure that there are benefits to Papua New Guinea from the sustainable use of its shark resource.
- c) To ensure that the utilization of the shark resource does not have negative impacts on coastal communities.

3. Management Arrangements

- a) The shark longline fishery will be managed nationally. A National Management Advisory Committee (NMAC) may be formed in accordance with paragraph (f) to advise the Managing Director on the management of the shark fishery.
- b) The NMAC will advise the Managing Director on management measures including, total allowable catch, seasons, reporting, restrictions, trade and any relevant issues that the Managing Director may direct from time to time.
- c) The Managing Director may direct the NMAC to examine a particular issue in the fishery or to review the Plan.
- d) The Plan will be reviewed by the NMAC at the direction of the Managing Director at least every one (1) year or at such earlier time as the Managing Director shall direct.

- e) Any review of the Plan shall be made public by the NMAC and comments will be invited from all stakeholders in the fishery.
- f) The National Management Advisory Committee will consist of the following persons, appointed by the Managing Director:
 - i. two National Fisheries Authority (NFA) representatives (one will be appointed Chair)
 - ii. one fishery scientist from outside NFA
 - iii. two fishing industry representatives
 - iv. a representative from a non-government organisation whose objectives include conservation of the marine environment and resources.
 - v. one representative from the recreational dive industry.
- g) Elected political office holders are ineligible for membership of the NMAC. Should an NMAC member be elected to a national or provincial political office during their term, their membership will automatically lapse.
- h) The Managing Director will appoint members to the NMAC for three year terms.
- i) The NMAC and its members shall operate in accordance with the following procedures and such other procedures and standards as may be set by the Managing Director:
 - i. a quorum requires four members and must include one NFA representative;
 - ii. the NMAC will meet as required, but no less than once a year;
 - iii. prior to taking up membership, representatives will be required to disclose any direct or indirect personal or pecuniary interests in the fishery, otherwise than as a member of, and in common with the other members of, an incorporated company consisting of not less than 25 persons. The nature of his or her interest shall be disclosed as soon as possible to the NMAC. Such a disclosure shall be recorded in the minutes of the NMAC and submitted to the Managing Director;
 - iv. the NMAC and Managing Director must be advised of any substantive changes in such interests, during the course of membership. The Managing Director will determine if a change in interests will affect that member's term; and
 - v. where a member who has an interest described in subsection 3(i)(iii), has not made a disclosure in accordance with that subsection, his or her vote shall be null and void retrospectively from the time such interest is considered and determined by the Managing Director and the Managing Director shall terminate the appointment of such a member.

4. Management Measures

The management measures set out in the management plan shall have the force of law upon notification in the National Gazette.

4.1 Licensing

- a) Licences required in the shark fishery shall be Fishing Vessel Licence, Fish Export Facility Licence, and Fish Factory Licences, issued under Section 2 of the Fisheries Management Regulation 2000.
- b) Fishing vessel or Export facility licences are not transferable.
- c) Only PNG citizen companies shall hold a licence in the shark fishery.
- d) Licences are valid for one year and subject to renewal.
- e) Only nine (9) licensed vessels, as listed in schedule 1, will be allowed to fish under the Plan, and all will operate as freezer vessels.
- f) Licences for the shark longline fishery shall only be issued, when clients show genuine commitment to comply with or in the case of renewal have met all licence conditions, provisions of the Plan and the Fisheries Management Act 1998 and Fisheries Management Regulations 2000, including any that may have prevailed prior to this Plan.
- g) Vessels issued shark fishing licences under this Plan will hold a licence for the shark longline fishery only.
- h) All licensed vessels must have automatic location communicators (ALC) installed and operational.

4.2 Prohibitions

- a) Longline fishing for sharks is permitted using only surface longline. Other methods, namely gillnets or bottom longline, are prohibited.
- b) Fishing effort in the shark longline fishery will involve up to nine (9) vessels provided such vessels were active in the fishery as of the gazettal date of this Plan. All such vessels shall operate as freezer vessels. The maximum aggregate effort by 9 vessels shall be not more than 10,800 hooks per day.
- c) As significant and increasing amounts of shark may be taken as bycatch by vessels licensed to fish for tuna, the shark fishery may be gradually phased down to a sustainable level with the removal of two vessels after the first year from the gazettal date of this Plan.
- d) The Shark Longline fishery is restricted to PNG citizen companies
- e) New entrants into the fishery are prohibited.

4.3 Total allowable catch

Total allowable catch (TAC) set for sharks is 2,000 mt dressed weight from the shark longline fishery. The TAC will be reviewed each year. This TAC does not include shark caught by fisheries other than the shark longline fishery, but does include an allowance for shark discarded and not landed by the shark longline fishery.

4.4 Observer

An observer coverage of twenty percent (20%) will apply to the vessels active in shark longline fishery. This will be based on the number of fishing days.

4.5 Reporting

- a) All reporting must be on standard shark longline logsheets as in schedule 3 and NFA approved report forms. Forms may be varied in consultation with NMAC.
- b) All catch must be recorded in the shark longline logsheet by species and weight in kilograms; shark discards will also be recorded. The logsheets must then be returned to the NFA within 15 days of the end of each voyage with all information correctly filled in, including non-fishing days.
- c) Summaries of monthly landings will be submitted to NFA by the fifteenth (15) day after each month on the form set out in schedule 2 to this plan.
- d) Fish export facility licensees must submit holding data to NFA on all shark product handled. This includes supplier's name, weight in kilograms and any other information that NFA may deem necessary.
- e) Exporters must report to NFA each time shark product is to be exported detailing the species, fin type, weight (in kilograms) and value (in US dollars) of the product.
- f) Failure to submit the required reports by more than fifteen (15) days from the day of export, or submitting incorrect data, including incorrect standard names, and submitting incomplete logsheets may result in suspension or cancellation of the fishing and fish export facility licence pursuant to the Fisheries Management Regulations 2000.

4.6 Area of operation

Commercial shark fishing is prohibited inside six nautical miles (6nm) from land, island or any emergent reef.

4.7 Mothership operation prohibition

Transfer of catch at sea from the vessels that caught the fish to a carrier or a vessel acting as a carrier and intending to solely transport the catch for purpose of landing or further transshipment is not allowed.

4.8 Charters and crewing

- a) No charter of foreign vessels is allowed.
- b) All crew must be Papua New Guinea citizens with exceptions for the positions of Captain, Engineer and Master fisherman.
- c) Foreign crew other than captain, engineer and master fisherman currently employed may be phased out as their current employment contracts expire and they are replaced by PNG nationals.

4.9 Penalty

Non compliance with management measures will result in penalties according to the Fisheries Management Act 1998.

5. Research

a) NFA :

- may cooperate with stakeholders, nongovernmental organizations (NGOs), and research institutions to carry out research and information gathering activities that will allow refinement of the plan.
- may work with Provincial Governments and other relevant organizations to establish local programs of fishery statistics collection.
- may commission or encourage research to identify negative environmental impacts of the shark fishery in PNG, and develop mitigation methods against them.

b) NFA may carry out research to obtain information necessary for management, including but not limited to;

- determination of factors for converting dressed sharks to live weight equivalents for the major species caught by commercial fisheries
- estimation of discards, including condition when caught, and fate of discards
- collection of size and age data for male and female sharks separately, to provide information on stock structure
- identification of critical habitats, including nursery or mating grounds, through determination of sex, stages of maturity for sharks that are caught, along with locations
- determination of age composition of the catch, including determination of an age length key to be used with length–frequency data
- determine estimates of indices of stock abundance through use of research vessels or commercial vessels to conduct standardized fishing
- operation of tagging programs for estimating growth, mortality and movement rates.

6. Customary Rights

Existing customary management measures, which are consistent with this plan are recognised by the NFA.

Endorsed this19th.....day ofMAY.....2003



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BAMAHE RUMBAM

Chairman National Fisheries Board

Approved this21st.....day ofMay.....2003



HON. ANDREW BAING, MP

MINISTER FOR FISHERIES

Schedule 1

List of vessels currently targeting sharks; as of September 2002.

1. Neptune 68
2. Neptune 38
3. Hung Hua No. 11
4. Weng Sheng No. 1
5. Feng Jung Chin No. 1
6. Chin Li No. 118
7. Wan Feng
8. Feng Jung No. 20
9. Yu Fu No. 11

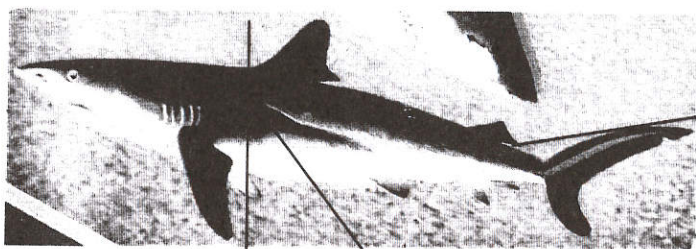
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Schedule 4

**THE COMMON SHARKS CAUGHT BY LONG LINE IN
PAPUA NEW GUINEA WATERS**

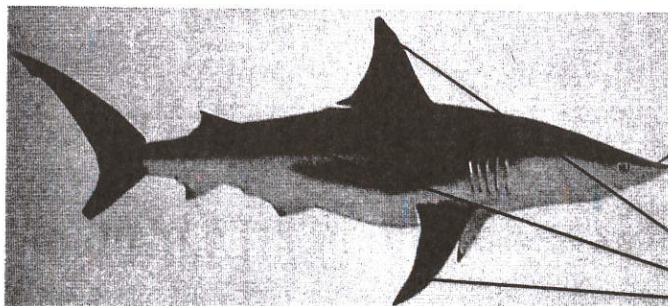
Name: SILKY SHARK *Scientific name: Carcharhinus falciformis*



Second dorsal fin with
elongated tips

First dorsal fin origin
behind pectoral rear tips

Name: BLACKTIP SHARK *Scientific name: Carcharhinus limbatus*

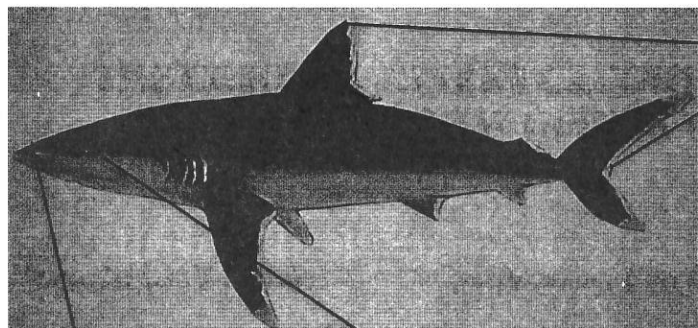


Snout moderately long
and moderately pointed

Eyes circular and
moderately large

Usually blacktips on most
fins in juveniles to adults

Name: **SILVERTIP SHARK** Scientific name: *Carcharhinus albimarginatus*

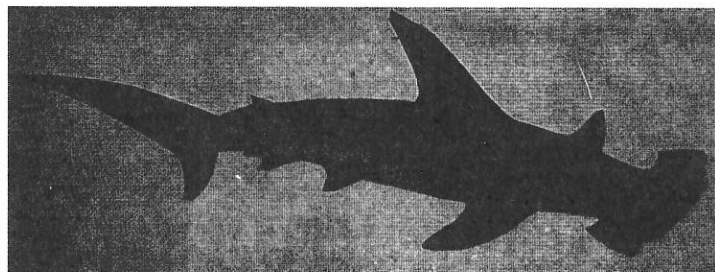


All fins with
conspicuous white tips
on the posterior margins

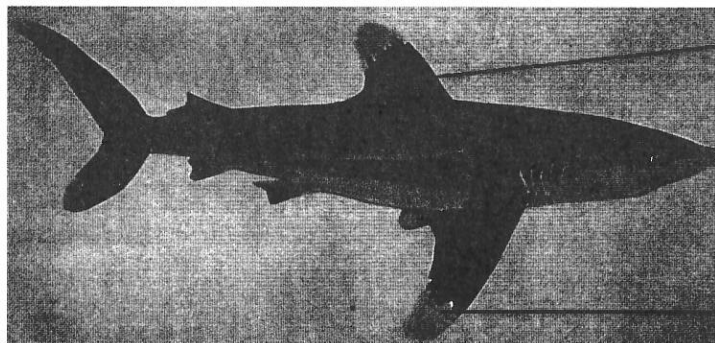
Snout moderately long
and broadly rounded

Eyes circular and
moderately large

Name: **HAMMERHEAD SHARK** Scientific name: (Family: *Sphyrnidae*)



Name: **OCEANIC WHITETIP SHARK** scientific name: *Carcharhinus longimanus*



High, rounded, white-
tipped first dorsal fin

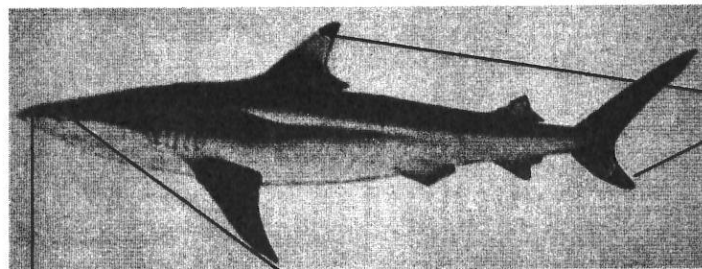
Snout short and blunt

Long, broad, paddled-
shaped pectoral fins

Note:

White motting usually present on fins, particularly pectoral, first dorsal, pelvic and caudal tips.

Name: BLACKTIP REEF SHARK *Scientific name: Carcharhinus melanopterus*

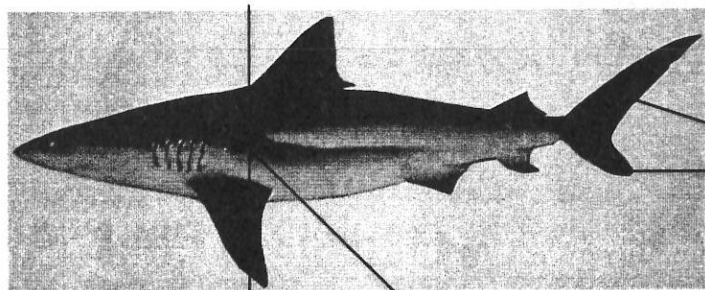


Snout short and bluntly rounded

Horizontally oval eyes

Brilliant black blotches on the first dorsal apex, lower caudal lobe and black tips on other fins

Name: GREY REEF SHARK *Scientific name: Carcharhinus amblyrhynchos*



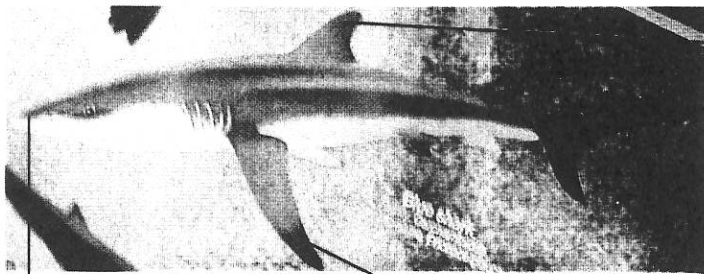
Broad black band

Note:

Pectorals, second dorsal and anal fins with blackish tips.

First dorsal fin origin near margin of pectoral rear tips

Name: **BLUE SHARK** Scientific name: *Prionace glauca*



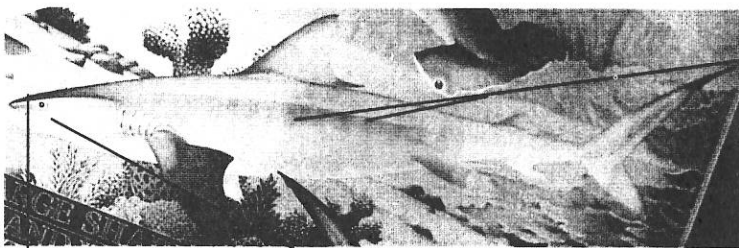
Dorsal coloration dark blue, bright blue on sides and abruptly white on the undersides

Note: Slender body shape

Long narrow snout

Long narrow, pointed pectoral fins

Name: **TIGER SHARK** Scientific name: *Galeocerdo cuvier*



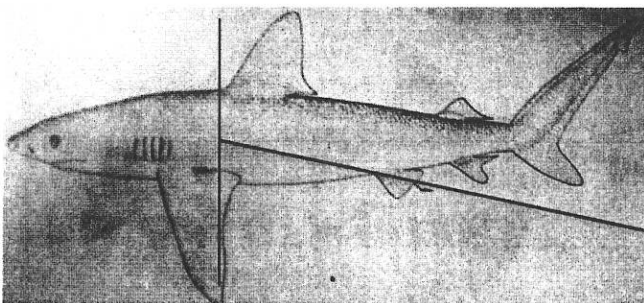
Characteristic dark, vertical tiger-stripe markings, faded or obsolete in adults

Large head, snout short and blunt

Large mouth with distinctive curved serrated teeth

Note: Posterior half of body slender

Name: **GALAPAGOS SHARK** Scientific name: *Carcharhinus galapagensis*



Moderately large first dorsal fin; origin in front of pectoral rear tips

Note: Has large pectoral fins

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