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### Fisheries data requirements under international law: achieving long-term conservation and sustainable use of tuna fisheries in the western central Pacific Ocean

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**FISHERIES DATA REQUIREMENTS UNDER  
INTERNATIONAL LAW: ACHIEVING LONG-TERM  
CONSERVATION AND SUSTAINABLE USE OF TUNA  
FISHERIES IN THE WESTERN CENTRAL PACIFIC  
OCEAN**

A thesis submitted in fulfilment of the  
requirements for the award of the degree

**DOCTOR OF PHILOSOPHY**

from

**UNIVERSITY OF WOLLONGONG**

by

**LARA MANARANGI-TROTT,  
BSc(Hons 1) – Biological Environments (Marine) (UNSW)**

**AUSTRALIAN NATIONAL CENTRE FOR OCEAN  
RESOURCES & SECURITY (ANCORS),  
FACULTY OF LAW  
2008**

## **CERTIFICATION**

I, Lara Manarangi-Trott declare that this thesis, submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the Australian Centre for National Ocean Resources & Security, University of Wollongong, is wholly my own work unless otherwise referenced or acknowledged. The document has not been submitted for qualifications at any other academic institution.

Lara Manarangi-Trott

8 October 2008

## Abstract

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There currently is a breadth of literature outlining and justifying international best practices for regional fisheries management organisations (RFMOs) to ensure that highly migratory and shared fish stocks under their purview, such as tuna, are effectively conserved and managed. Most of this literature has noted the link between quality data and the formulation of scientific advice, which subsequently underpins the development and implementation of fishery conservation and management measures. However, the literature to date has not evaluated how tuna RFMOs can effectively balance the diverse capabilities of their members, including developing States, so that the best quality data can support scientific analyses on impacts of fishing. This thesis examines and analyses the implementation of international legal requirements, and application of international best practices, for fisheries data by a relatively young tuna RFMO: the *Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean* (WCPFC). The WCPFC was established following the adoption of the *Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks* and is responsible for ensuring the long-term conservation and sustainable use of 50% of current global principal market tuna catch. Approximately 20% of global tuna resources are taken in the exclusive economic zones (EEZs) of Pacific Islands States, and Pacific Island States therefore have a vested interest in ensuring that the best quality fisheries data underpins scientific advice. This thesis reviews the innovative and collective approaches established by Pacific Island States and their contribution towards WCPFC data practices. Also examined are the future implications of WCPFC data practices for Pacific Island States.

International law requires States to provide fisheries data to tuna RFMOs. Scientific analyses of impacts of fishing require fisheries data covering characteristics of tuna and the surrounding ecosystem, the catch and effort of the fisheries, the characteristics of the fisheries themselves and their response to fishing. Consistent with a sustainable and responsible approach to fisheries management, data should also cover species that are not targeted but may be impacted on by the fisheries, or that are dependent on or found in association with tunas. To ensure the best quality data can support scientific analyses on impacts of fishing, tuna RFMOs need: to establish: databases to compile these data; to establish integrated data verification schemes to check that data is complete and accurate; and arrangements to share fisheries data must include the requirement to maintain confidentiality. At the global level, data on tuna

fisheries is compiled by the Food and Agriculture Organisation of the United Nations and institutional arrangements have been established to cross-check with data compiled at the regional level by tuna RFMOs.

Pacific Island States have established practices to collect and share data on fishing activities in their EEZ, data needed to support stock assessment, vessel and gear information, and data on non-target species. These same data collection practices for Pacific Island States have formed the foundation of WCPFC data practices. The use of existing regional arrangements and standards has enabled the WCPFC to meet international legal requirements and to make significant progress towards achieving international recommended best practices for tuna RFMOs. However, there are gaps in the implementation of data requirements by WCPFC members, and progress can be made to further improve the quality of data, notably more complete coverage and improved accuracy.

This thesis concludes that if the WCPFC is to receive the best quality data, it is contingent on: first, coastal States, particularly Pacific Island States, continuing to take responsibility for leading the establishment and implementation of effective WCPFC data practices; second, the WCPFC establish a process to regularly assess WCPFC members data provision to the WCPFC; and third, the WCPFC continue progress to establish an integrated WCPFC verification scheme. Additionally, the Joint Tuna RFMO process could also be used to maintain pressure for the WCPFC to adopt best practice standards for tuna RFMOs. Ultimately, the achievement of long-term conservation and sustainable use of tuna fisheries in the western and central Pacific Ocean will depend on sufficient political will by all WCPFC members to heed scientific advice, and take effective conservation and management action in accordance with the precautionary approach.

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This PhD candidature has been quite a journey for me, in personal and professional growth. At times it has felt as though the journey had overtaken the writing of this thesis. The journey has been quite an adventure, and has given me many experiences, professional opportunities and friends. This thesis is very much a product of my growth and experiences over the last six years, and is an interlude in my journey.

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## Abbreviations and Special Names

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<b>Ad hoc Task Group [Data]</b>	A subsidiary body of the WCPFC that was established in 2006 to identify types of data that must be treated as confidential and to develop draft rules and procedures to govern the security and confidentiality of data collected and held by the Commission.
<b>CCSBT</b>	Commission for the Conservation of Southern Bluefin Tuna.
<b>CCMs</b>	Used in the WCPFC, and refers to Commission Members, Cooperating Non-Members and participating Territories collectively.
<b>CMM</b>	Conservation and Management Measures, binding decisions taken by a Commission.
<b>Code of Conduct</b>	FAO Code of Conduct for Responsible Fisheries.
<b>COFI</b>	Committee on Fisheries.
<b>Commission</b>	The decision-making body of a tuna RFMO.
<b>CPUE</b>	Catch per Unit of Effort.
<b>CWP</b>	Coordinating Working Party on Fishery Statistics.
<b>EEZ</b>	Exclusive Economic Zone.
<b>EPO</b>	Eastern and Central Pacific Ocean (refers to the oceanic waters east of 150°W).
<b>FAO</b>	Food and Agriculture Organisation of the United Nations.
<b>FAO Compliance Agreement</b>	Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas of 24 November 1993, entered into force from 24 April 2003.
<b>FAO Guidelines-Sea Turtles</b>	FAO Guidelines to reduce sea turtle mortality in fishing operations, endorsed by COFI in 2005, for voluntary implementation by States and RFMOs.
<b>FAO Strategy on Improving Information in Fisheries</b>	Strategy for Improving Information on Status and Trends of Capture Fisheries, adopted by FAO Conference in 2003.
<b>FADs</b>	Fish Aggregation Devices.
<b>FIDI</b>	FAO Fisheries Information, Data and Statistics Unit.
<b>FFA</b>	Pacific Islands Forum Fisheries Agency (formerly the South Pacific Forum Fisheries Agency), established by the South Pacific Forum Fisheries Agency Convention of 10 July 1979.
<b>FFA/SPC memorandum of understanding</b>	Memorandum of Understanding between the Pacific Islands Forum Fisheries Agency and the Secretariat of the Pacific Community concerning Collaboration in the Development, Conservation and Management of the Tuna and related Resources of the Western and Central Pacific, of 18 November 2007.
<b>FFA Minimum Terms and Conditions of Fishing</b>	The Harmonised Minimum Terms and Conditions for Foreign Fishing Vessel Access, as amended by FFC34 held 24-28 November 1997.
<b>FFC</b>	Forum Fisheries Committee, governing body of FFA.
<b>FIGIS</b>	Fisheries Global Information System.
<b>FIRMS</b>	Fisheries Resource Monitoring System.
<b>FSM</b>	Federated States of Micronesia Arrangement for Regional Fisheries Access of 30 November 1994.
<b>Arrangement FTP</b>	A common abbreviation which stands for File Transfer Protocol, and refers to a system that enables the transfer of files across a computer network.
<b>GDP</b>	Gross Domestic Product.



<b>Heads of Fisheries</b>	Governing body of SPC.
<b>IATTC</b>	Inter-American Tropical Tuna Commission.
<b>ICCAT</b>	International Commission for the Conservation of Atlantic Tunas.
<b>IOTC</b>	Indian Ocean Tuna Commission.
<b>IPOA-IUU</b>	International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, adopted by the FAO Conference in 2001.
<b>IPOA-Seabirds</b>	International Plan of Action for reducing incidental catch of seabirds in longline fisheries, adopted by the FAO Conference in 1999.
<b>IPOA-Sharks</b>	International Plan of Action for the conservation and management of sharks, adopted by the FAO Conference in 1999.
<b>ISC</b>	International Committee for Scientific Research on tuna and tuna-like species in the North Pacific.
<b>IUU Fishing</b>	Illegal, Unregulated and Unreported Fishing.
<b>kg</b>	Kilogram.
<b>LOS Convention</b>	United Nations Convention on the Law of the Sea of 10 December 1982.
<b>MHLC</b>	Multilateral High-Level Conference on the Conservation and Management of Highly Migratory Fish Stocks in the Western Central Pacific.
<b>Mt</b>	Metric Tonne.
<b>MULTIFAN-CL</b>	A length-based, age-structured analytical model for fisheries stock assessment which makes use of catch, effort and catch composition data. This is the fisheries stock assessment model commonly used for WCPO tuna stock assessments.
<b>Multilateral Treaty on Fisheries</b>	Treaty on Fisheries Between the Government of Certain Pacific Islands States and the Government of the United States of America and its subsidiary agreements, of 15 June 1993.
<b>Nauru Agreement</b>	Nauru Agreement concerning Cooperation in the Management of Fisheries of Common Interest of 11 February 1982.
<b>Niue Treaty</b>	Niue Treaty on Cooperation in Fisheries Surveillance and Law Enforcement in the South Pacific Region of 9 July 1992.
<b>Northern Committee</b>	A subsidiary body of the Commission established pursuant to Article 11(7) of the WCPF Convention, and provides advice and recommendations for conservation and management of highly migratory fish stocks mostly found in the area north of 20N.
<b>Pacific Islands region</b>	Pacific Islands region (is a sub-area of the western and central Pacific Ocean and refers to the EEZs of the 14 Pacific Island States and surrounding high seas).
<b>Pacific Island States</b>	The fourteen independent island countries within the WCP region: Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.
<b>Palau Arrangement</b>	Palau Arrangement for the Management of the Western Pacific Purse Seine Fishery of 2 October 1992.
<b>PrepCon</b>	The Preparatory Conference for the Establishment of the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean.
<b>PrepCon Science Working Group</b>	Working Group II on the scientific structure of the Commission and the provision of interim scientific advice (a subsidiary body of PrepCon).
<b>PNA Group</b>	Parties to the Nauru Agreement: a subregional group within the WCP region, namely Federated States of Micronesia, Kiribati, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands and Tuvalu.
<b>Principal market tunas</b>	Refers to skipjack ( <i>Katsuwonus pelamis</i> ), yellowfin ( <i>Thunnus albacares</i> ), albacore ( <i>T. alalunga</i> ), and bigeye ( <i>T. obesus</i> ) tuna species.

<b>Principal market tunas, including bluefin tunas</b>	Refers to skipjack ( <i>Katsuwonus pelamis</i> ), yellowfin ( <i>Thunnus albacares</i> ), albacore ( <i>T. alalunga</i> ), bigeye ( <i>T. obesus</i> ) tuna species, as well as southern bluefin ( <i>T. maccoyii</i> ), Atlantic bluefin ( <i>T. thynnus</i> ) and Pacific bluefin ( <i>T. orientalis</i> ) tuna species.
<b>rete</b>	A specialized feature of the circulatory systems for tuna and billfishes that enables thermoregulation. It is understood that the level of development of the rete is positively correlated with the ability of a species to withstand the sudden temperature changes from rapid dives to depth, and to swim at fast speeds.
<b>RFMOs</b>	Regional Fisheries Management Organisations.
<b>SCTB</b>	Standing Committee on Tuna and Billfish.
<b>SC</b>	Scientific Committee of the WCPFC, subsidiary body of the Commission established pursuant to Article 11 of the WCPF Convention.
<b>SIDS</b>	Small-island Developing States.
<b>SPC</b>	Secretariat of the Pacific Community (formerly the South Pacific Commission), established by the Agreement establishing the South Pacific Commission of 6 February 1947.
<b>SPC-OFP</b>	Oceanic Fisheries Programme of the Secretariat of the Pacific Community.
<b>TCC</b>	Technical and Compliance Committee of the WCPFC, subsidiary body of the Commission established pursuant to Article 11 of the WCPF Convention.
<b>TUFMAN</b>	Tuna Fishery Data Management System, fisheries database software developed by SPC-OFP for Pacific Island States.
<b>tuna and billfish</b>	Collectively refers to species of principal market tunas, bluefin tunas and billfish.
<b>UN</b>	United Nations.
<b>UN Fish Stocks Agreement</b>	Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, of 4 December 1995.
<b>VDS</b>	Vessel Days Scheme of the Parties to the Nauru Agreement.
<b>VMS</b>	Vessel Monitoring System.
<b>WCPF</b>	Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western Central Pacific Ocean, of 5 September 2000.
<b>Convention</b>	Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western Central Pacific Ocean.
<b>WCPFC-IATTC memorandum of understanding</b>	Memorandum of Understanding between the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean and the Inter American Tropical Tuna Commission.
<b>WCPFC-SPC memorandum of understanding</b>	Memorandum of Understanding between the Commission for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean and the Secretariat of the Pacific Community.
<b>WCPFC Convention Area</b>	Refers to the area of competence of the WCPF Convention as described in Article 3 of the WCPF Convention. Article 3 describes a line, and by definition the Convention Area comprises all waters of the Pacific Ocean bounded to the south and to the east by this line. Note that there is no specified boundary to the north and west.
<b>WCPFC Statistical Area</b>	Noting the lack of north and west boundary, the WCPFC Statistical Area is an area that has been formally adopted by the Commission for “statistical purposes” only. This includes a specific line between Australia and Indonesia.
<b>WCPO</b>	Western and Central Pacific Ocean (refers to the oceanic waters west of 150°W).