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Assessing the Potential for Transferability of Access Rights to Enhance Sustainability in Large Pacific Tropical Fisheries

Transform Aqorau, Kamal Azmi, Elizabeth Havice, Stuart Kaye, Stuart Kininmonth, Moses Mataika, Sarah McTee, Anthony Morrison, Lars Olsen, Mark Soboil, Siale Suamalie, Salome Taufa, Alice Thomas-Smyth, and John Virdin

Nicholas Institute for Environmental Policy Solutions nicholasinstitute.duke.edu

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Author Affiliations

Transform Aqorau: iTuna Intel

Kamal Azmi, Stuart Kaye, and Anthony Morrison: University of Wollongong, Australia National Centre for Ocean Resources & Security

Elizabeth Havice: University of North Carolina – Chapel Hill

Stuart Kininmonth, Moses Mataika, Siale Suamalie, and Salome Taufa: University of South Pacific, School of Marine Studies

Sarah McTee and Alice Thomas-Smyth: Environmental Defense Fund

Lars Olsen and Mark Soboil: Independent experts

John Virdin: Duke University's Nicholas Institute for Environmental Policy Solutions

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Summary for Pacific Island Policy Makers

INTRODUCTION: THE GOAL AND MOTIVATIONS FOR CONDUCTING THIS STUDY

This study was conducted in order to identify options for the transferability of fishing rights in the context of Pacific Island commercial longline and purse seine tuna fisheries (where the rights are denominated in units of fishing effort, i.e., fishing days), including the scale of potential benefits and costs to countries and territories in the region, and key issues that would need to be considered by decision makers in order to develop specific policy proposals. The study does not aim to predict the costs and benefits of specific policy proposals for transferability, but rather to conduct an initial scoping that would allow for such a detailed analysis to take place, and to provide a sound basis of information for policy dialogue in the region.

The motivation for conducting this study was to provide information that can assist policy makers and fisheries managers in the region to consider if this policy instrument (enhanced transferability of fishing rights) could support achievement of the goals agreed in the Regional Roadmap for Sustainable Pacific Fisheries.[1] Achieving these goals will take significant effort in this, one of the world's largest and most complex fisheries to manage. The tuna fisheries most relevant to Pacific Island countries and territories (PICT) are the units of analysis here: the purse seine fishery, the tropical longline fishery, and the southern albacore fishery. Numerous successes and innovations in governance of the purse seine fishery have led to exponential growth in economic benefits for Pacific Island countries and territories, but as this growth has slowed, future gains are likely to be incremental and result from greater efforts to strengthen governance and enhance efficiency—such as introducing transferability. At the same time, economic benefits to the region from the two longline fisheries have stagnated, and governance innovations are both needed and currently underway or in development. This study was proposed by a group of regional thought leaders in part to consider if transferability might be one such innovation, based on examples in other fisheries where limited fishing rights were allocated to vessels and operators with differing levels of efficiency, and the creation of a secondary market in these rights allowed for vessels and/or operators to trade in order to increase the overall efficiency of the fishery and economic outcomes.

THE CONCEPTUAL BASIS FOR DEFINING TRANSFERABILITY OF FISHING RIGHTS IN THE CONTEXT OF PACIFIC ISLAND TUNA FISHERIES

Well-established research on the role of property rights in governance of common pool resources such as fish stocks, forms the basis for this study. The study draws upon decades of theoretical and empirical research on the performance of different governance regimes in complex systems such as Pacific Island tuna fisheries, pioneered at Indiana University's Workshop in Political Theory and Policy Analysis. From this work, the study provides a summary of the role of property rights in governing commercial fisheries in general, and with particular attention to complications associated with highly migratory species. The specific property rights characteristics of the rules

governing fishing have been shown to be one of the key factors driving fishing effort and catch in commercial fisheries, and one of the key solutions to the commons problem inherent in fisheries.

On this basis, the property rights characteristics of the rules governing tuna fishing are defined, with transferability being one dimension of these rights. Common characteristics of fishing rights also include the type of rights holder, the space over which the rights apply, the stringency with which the rights are enforced, and the time prescribed for the rights. Based on these common characteristics, the rules governing tuna fishing in the Pacific Islands can be summarized, as shown in the following framework (which uses the Vessel Day Scheme for the purse seine and tropical longline fisheries as an example):

Table 1. Description of the Various Rights and holders of Fishing Rights in Western and Central Pacific Ocean (WCPO) Tuna Fisheries

	Theory (e.g., type of rights holder)	Spatial Coverage	Stringency	Time	Transferable (yes/no)
Regional	Western and Central Pacific Fisheries Commission (WCPFC) = claimant/ proprietor (specifies rules for states, fleets)	WCPO (100% match)	Low	Unlimited	No transfers between RFMOs
Sub-regional	PNA = proprietor (specifies total effort, and portion allocated to members)	9 EEZs (purse seine ~75% of the fishery; longline ~30% of the fishery)	Medium	PNA total allowable effort determined annually. Right to utilize fishery held in perpetuity.	No transfers between subregional groups
National	PICTs = resource owner (specifies individual effort authorizations, as fishing days)	PICTs issue access rights for EEZs*	High	The formula for Parties' allowable effort not fixed, and must be recalculated each year, though PICTs' rights to fish resources in EEZsheld in perpetuity	Yes, transfers allowed between PICTs of fishing days authorized for a given year, but not of perpetual rights
User	Individual entity (e.g., fishing companies) = authorized users	Authorization for specific EEZ only	High	1 year	No

Note. Cells shaded in red are highlighted as particular characteristics of rights that could be strengthened. *In some cases, the Parties to the Nauru Agreement (PNA) have cooperated to issue individual effort authorizations to vessels, for a space larger than any one EEZ, but for the space equivalent to their collective EEZs.

Drawing upon this framework, Pacific Island tuna fishing rights are defined here as authorizations to access and withdraw tuna from a given space, during a prescribed time period (fishing days). In fisheries based on highly migratory species such as tuna, transferability of fishing rights is defined as the extent to which the rights can be divided and traded on two different levels: (i) between states and (ii) between authorized users (e.g., fishing companies). Transferability can occur between

cooperating states once they determine a total catch or effort and have allocated it among themselves and when they develop a framework through which states can transfer nationally allocated rights among themselves. Transferability can also occur at the level of the user, once an individual state allocates the fishing right to individual or specific user groups, who may then trade the rights among users. In the Pacific Islands, transferability of tuna fishing rights between PICTs already occurs within the context of the Vessel Day Scheme (VDS) agreed to govern access to the purse seine and tropical longline fisheries, but not at the user level. This discussion of transferability of tuna fishing rights at the level of resource users is distinct from the question of transferability of tuna fishing rights between states (already in practice in the VDS), and distinct from the question of "pooling," which refers to states cooperating to change the space to which the fishing rights they collectively issue applies.

In terms of the transferability of fishing rights between authorized users (e.g., firms), both theory and empirical research suggests allowing such trades can help increase the overall economic outcomes from a fishery, by creating a market mechanism to ensure that marginal benefits are realized.

Transferability of fishing rights is theorized to allow users (e.g., fishing companies) to restructure in response to changes in technology, markets, resource conditions, and the environment, for example if one economic agent can harvest an increment of fish more efficiently than another, but lacks the right to carry out that additional harvesting, it could purchase the right from the less efficient agent and increase its profits as well as the overall static (and dynamic) efficiency of the fishery. Another example would be if an economic agent's fishing vessel experiences maintenance problems, that agent can transfer its fishing right to another who could use it profitably. In such cases profits are increased for both participants in the trade (the gains of the trade), and thus the fishery as a whole, thereby increasing the maximum attainable public revenues that Pacific Island countries and territories could obtain from license fees. In the VDS, a transferability mechanism for fishing rights could also guard against unexpected changes in the number of fishing days a vessel is able to utilize in a given EEZ due to weather, including El Niño events, and vessel breakdowns. Alternatively, possible risks of allowing transferability of fishing rights include industry consolidation and monopolistic or oligopolistic behavior to affect pricing by Pacific Island countries and territories of tuna fishing rights; potential loss of employment by Pacific nationals if trading is permitted between domestic and foreign-registered fleets; and the risk of increased total effective fishing effort (i.e., effort creep) that reduces fish stocks (given that the rights are denominated in Pacific Island tuna fisheries in units of fishing effort).

Experience has shown that there are some standard steps to introduce transferability of fishing rights between authorized users in fisheries based on highly migratory species such as tuna (as well as others, e.g., halibut, sardine, etc.). These include: (i) setting the cap on fishing, including the policy goal that the limit aims to achieve and the approach or type of limits, e.g., effort or catch-based; (ii) allocating the fishing rights among the group of states, within the cap (i.e., total limits); (iii) member states allocating the fishing rights (for access and withdrawal) to authorized users; and then (iv) states allowing for transferability at one or both levels, between states in step two, and/or between authorized users in step three for the duration defined in the right, typically accompanied by a range of reporting requirements.

SNAPSHOT OF THE PERSPECTIVES OF PACIFIC ISLAND THOUGHT LEADERS AND TUNA FISHERIES MANAGERS

The study summarizes the views expressed in semi-structured interviews with 21 senior Pacific Island fishery managers and thought leaders, concerning the current state of knowledge in the region on transferability of tuna fishing rights, perceived opportunities and key concerns, particularly the perceived potential economic benefits of transferability among resource users to Pacific Island countries and territories.

Respondents indicated a wide spectrum of familiarity and experience with the concept of transferability in fishing rights. In general, responses point to a consensus that while some managers and advisors in regional organizations understand the concept well from experiences in other fisheries, within Pacific Island governments the concept is often understood in the context of the tuna fisheries as referring to trades between states based on the example of the purse seine Vessel Day Scheme. For example, several countries may wish to expand the group cooperating to manage the tropical longline fishery or the purse seine fishery, by joining in the Vessel Day Scheme, which would facilitate more transferability between states. Several respondents emphasized the potential benefits to states with smaller and less productive zones that are not currently participating in the VDS, to be able to transfer the rights that they currently issue to users, to other states with more productive zones and higher demand (i.e., as new participants in the VDS they could transfer the fishing rights—denominated as fishing days—that they are allocated within the cap, to other participating states, rather than issue them to users for access to their EEZs). In terms of introducing transferability of rights between users in a given EEZ, multiple respondents felt that this change would increase flexibility for companies and subsequently reduce costs, as well as increase access to finance by creating an asset in fishing rights.

At the same time, there was some caution suggested in a number of responses, frequently around concerns that transferability may erode Pacific Island countries and territories' control over fishing within the zones under their jurisdiction. For example, one respondent asked if the benefits will only accrue to foreign economic agents via trades, or would Pacific Island countries and territories be able to develop a mechanism to capture these benefits? Additionally, some respondents questioned if Pacific Island countries and territories might lose some control as potentially new players enter the fisheries via trades, rather than through bilateral agreements or relationships with governments.

Respondents noted there may be other policy or management changes that should be considered first, or that would be more beneficial than enhancing transferability of access rights. As one respondent concluded, in theory there are efficiency gains from introducing transferability of tuna fishing rights between authorized users, in practice they may be relatively limited in the Pacific Island purse seine fishery. Another respondent emphasized that other property characteristics of the tuna fishing rights would likely need to be strengthened first in order to create demand for transferability, for example (Table 1) expanding the space to which the rights apply such that the secondary market would be larger, at two levels: (i) at the subregional level by expanding the group of countries cooperating to set the cap on fishing and allocate the rights to fish (i.e.,

additional countries joining the Vessel Day Scheme managingthe Pacific Island purse seine fishery), and (ii) at the national level by expanding the space over which governments issue authorizations to fish (i.e., "pooling" between governments). Additionally, extending the time prescribed for the rights could enhance demand for trades, e.g., from one year to three, five or ten years. One respondent emphasized that the industry would prefer a longer duration for access rights more than transferability, while another suggested that the short duration is a constraint on private sector and investment.

In summary, of those respondents that expressed an opinion about the potential costs and benefits of introducing transferability, roughly 55 percent were supportive of pursuing the idea, subject to doing so cautiously and with safeguards for Pacific Island countries and territories. As one respondent mentioned, the idea has a lot of potential, but "people need to go into it with their eyes wide open as there are risks involved. This is why it needs to be done in a slow, methodical way to not jeopardize [Pacific Island countries and territories'] revenue streams." On the other hand, a number of respondents (15%) suggested that the current system was preferable, and 30 percent expressed the need for more information before sharing an option about this type of change.

CASE STUDIES ON THE POTENTIAL ECONOMIC BENEFITS TO PACIFIC ISLAND COUNTRIES AND TERRITORIES FROM THE INTRODUCTION OF TRANSFERABILITY

A stylized model was developed to assess the scale of the potential economic benefits to be gained from introducing transferability of fishing rights between authorized users in the purse seine fishery, while also considering the tropical longline fishery. For the purse seine fishery, cases were considered in a hypothetical Pacific Island country and territory where purse seine fishing is highly productive, meaning high total annual catch and CPUE, as compared to a hypothetical country or territory where it is much less productive (lower CPUE and significantly lower total annual catch). In the case of the tropical longline fishery, the case study is qualitative, to describe the prerequisites that would be necessary for transferability between authorized users to be viable.

The case study for the purse seine fishery only considers transferability between authorized users with foreign-registered vessels, for the current duration the days are valid for use (one calendar year). If trading of tuna fishing rights (denominated in fishing days, irrespective of vessel size) were allowed between domestic and foreign-registered vessels, the study assumed that the former are less profitable and would trade their rights to the latter, potentially reducing employment of Pacific Island nationals and other secondary benefits derived from locally based operations. Given the employment-specific goals in the Roadmap, this study only focused on gains that could be achieved at the current level of local employment.

In the example of a Pacific Island country or territory where purse seine fishing is more productive, the scale of the economic gains to the country or territory from trading are likely to be modest at best—estimated to be on the order of 1 to 2 percent in some scenarios. In the example of a less productive country or territory, the economic gains from trading were negligible, suggesting relatively uniform catch rates among fishing entities. These results from the model reflect in both cases

that foreign-registered fleets commonly operate at a vessel-level daily loss as part of vertically integrated firms seeking supply, based on cost assumptions used and publicly available data on effort and revenues. The results however capture potential benefits to the harvesting subsector only, and not potential efficiency gains along the value chain that could further increase firms' willingness-to-pay for rights on the secondary market.

These results are likely explained by the relatively small market size for trading fishing days in most Pacific Island countries and territories (limiting the surplus available for trades), as well as assumptions that many foreign-registered fleets are running vessel-level economic losses as part of vertically integrated firms. Additionally, the relatively short duration of the rights (one year) allows for new entrants without trading, further reducing demand for trades (where newer, more efficient operators might replace older, less efficient operators). Finally, many authorized users are part of associations or collectives, which purchase the rights from governments and then can transfer days among as many as 20 to 30 vessels in some cases. Given these conditions, the initial allocations of access rights, i.e., fishing days, may be relatively efficient, reducing further gains from allowing transferability in the current context.

Upon review of the tropical longline fishery, the basic conditions for transferability of fishing rights are not considered to be in place, nor is it possible to quantitatively model effects of a governance change. The prerequisites for transferability suggested by theory and empirical evidence (see Allen et al. 2010) include: setting a cap on fishing (defined in either fishing inputs or outputs) that creates an overall limit to achieve a shared goal, allocating the fishing rights among the group of cooperating states, within the cap (i.e., the total limit); and cooperating states then allocate fishing rights to authorized users.

However, in the case of the tropical longline fishery, the current cap on allowable fishing effort (i.e., total allowable effort) applies to less than half of the total fishing effort, and has steadily increased from 2014 (e.g., from 130,000 fishing days to over 165,000 days in 2016). Without the first condition met, there is not currently a scarcity on tuna fishing rights in the fishery that would support a secondary market with transferability. Indeed, many Pacific Island countries and territories have a surplus of fishing days, as high as 75 percent of their allocations in the VDS.

LEGAL ISSUES AND OPTIONS FOR TRANSFERABILITY OF PACIFIC ISLAND TUNA FISHING RIGHTS: CURRENT PRACTICE AND MODELS FOR THE REGION

Currently, no Pacific Island country has a functioning legislative schema allowing for full transferability of tuna fishing rights between authorized users, and in four countries the legislation effectively prohibits such transferability. Based on analysis of the legislation of Pacific Island countries, all would require legislative intervention to introduce transferability between users.

Australia's legal framework for transferability of fishing rights provides a model for Pacific Island countries, given other legislation that the countries have modelled on Australia's example. The Australian legal framework for the transferability of fishing rights has been operating for more than five years and has the advantage of being part of a wider system of managing personal

property transactions, which may have wider implications for business. The Australian legislation creates a registry for personal property (as defined in the law), that would allow for transfers, and fishing rights have been added to the list of property included. Personal property reforms, based on the Australian model, are taking place throughout the Pacific Islands, with personal property registration legislation now existing in the Republic of the Marshall Islands, the Federated States of Micronesia, Papua New Guinea, Tonga, Fiji, Samoa, Solomon Islands, Palau, and Vanuatu. This trend will allow multinational financial institutions to become familiar with the registries and make it easier to establish a transferable system of rights in the region because PICTs have similar legislative packages that create transparent and searchable registries.

The similarities in recent legislation adopted by a number of Pacific Island countries based on Australia's model for personal property, could be adapted relatively easily to facilitate transferability of tuna fishing rights between authorized users. Essentially, countries would need to amend their national fisheries legislation to make "authorizations to fish" a registerable instrument. To do this, registries would need to be designed and implemented for rights, and for the trades (e.g., added to the Fisheries Information Management System used in the purse seine fishery).

IMPLICATIONS FOR PACIFIC ISLAND COUNTRIES AND TERRITORIES

For the purse seine fishery, allowing transferability of tuna fishing effort rights between users, essentially transitioning from the current regime based on individual user allocations of effort (IE) to one based on allocations of individual transferable (ITE) rights, may be an innovation whose time has not yet come. While it would be relatively simple to adapt most Pacific Island legislation to allow transferability of tuna fishing rights between authorized users, our coarse economic model, based on publicly available data and industry insights, suggests that in the short-term the scale of the economic gains to the countries from doing so for users with foreign-registered vessels would be relatively modest in highly productive zones, and negligible in less productive zones. This likely reflects the small size of a secondary market for trades in the zones of most countries or territories and relatively small differences in vessel productivity, the short duration of the rights to be traded (one year), the limited transferability that already occurs within collectives or associations of firms (which may include fleets of as many as 20–30 vessels), and the consideration that many firms are vertically integrated and generate the majority of profits higher in the value chain while operating in the harvest segment closer to the break-even point so that there are fewer differences in vessel productivity (without considering information and transaction costs to trading). Essentially, the higher the volume of trading that would occur, the greater the efficiency gain for the fishery can be assumed. However, given all of these previous factors, trading is assumed to be relatively limited within current zones of the purse seine fishery (many zones may not be large enough and productive enough for transferability to allow for significant trading), suggesting that the allocation of access rights (i.e., fishing days) is likely to be relatively efficient in the current context. Additionally, as one respondent noted, given the relatively short duration of the rights (one year), transferability is not necessary in order to facilitate efficiency gains from newer, more efficient operators replacing older, less efficient ones–the newer operators can simply outbid the older ones the following year.

The theoretical and empirical evidence, as well as perspectives of some respondents, suggests that there are opportunities for Pacific Island countries and territories to strengthen other property rights characteristics of access, specifically the authorizations they issue for purse seine fishing, which would serve as pre-cursors to transferability (and increase the demand for it). While it may be early to introduce transferability in the purse seine fishery, given the slowdown in the growth of economic gains to Pacific Island countries and territories from the fishery, strengthening the property characteristics (i.e., the theory, space, time and transferability) of tuna access rights may hold potential for increasing value in the fishery and advancing progress toward achieving the goals of the Roadmap. Referring to the framework outlined in Table 1, some options that may help increase economic gains while creating demand for transferability, include:

- ***Expanding cooperation [subregional]***: At the subregional level, expanding the group of cooperating states that function as the proprietor for access to the resource, from the eight Parties to the Nauru Agreement plus Tokelau, to include a greater share of the fishery and expand the cap on fishing, as well as the space to which rights may apply—e.g., the countries described by Arnason et al. (2015) as "the competitive fringes," Indonesia and the Philippines, or other Pacific Island countries and territories not currently Parties to the Nauru Agreement;
- ***Increasing "pooling" [national]***: At the national level, continue increasing the space over which tunafishing rights are issued, i.e., the number of zones to which a fishing day applies;
- ***Extending the duration of tuna fishing rights [user]***: For users (i.e., harvesters), Pacific Island countries and territories could collectively or individually begin to extend the duration prescribed for the tuna fishing rights that they issue, e.g., from one year to three, five or even ten years; and
- ***Allowing transferability of tuna fishing rights between authorized users [user]***: As described previously, allowing authorized users the flexibility to trade tuna fishing rights that cover a larger space (i.e., "pooled" rights) and extend over a longer period time.

For the longline fisheries, given their relatively flat or declining economic productivity, strengthening the property rights characteristics of the authorizations to fish holds potential for advancing the goals of the Roadmap. In the absence of a cap on fishing for the region's longline fisheries and an allocation framework for that cap, the prerequisites for transferability have not yet been met. In the tropical longline fishery, roughly half of the catch is typically taken in international waters (i.e., the high seas), and zones outside of the jurisdiction of Pacific Island countries and territories (e.g., Indonesia). Similarly, in the southern albacore longline fishery, catches in international waters have typically been on the order of one third of the total catch—presenting a challenge that may perhaps be surmountable with cooperation by the states with jurisdiction over the zones where the other approximately two-thirds of the catch is taken. For the time being, without a cap on fishing, there is not currently a scarcity on access and withdrawal rights in these two longline tuna fisheries that would create enough demand for fishing days to support a secondary market with transferability. Essentially, if transferability of tuna fishing rights between users

can be considered as a cap and trade scheme, then without the cap, there is no trade to be made. Referring to the framework in this report on these characteristics, some options that may help increase economic gains while creating demand for transferability, include:

- ***Expanding cooperation [subregional]***: particularly in the tropical longline fishery, where the Vessel Day Scheme introduced by Parties to the Nauru Agreement currently governs only approximately 30 percent of fishing effort;
- ***Setting the cap on fishing [subregional***]: such that total fishing catch or effort supports achieving the goalsin the Roadmap, to the extent that Pacific Island countries and territories are able to include enough states and their respective zones in the group cooperating (previous step), that the rules they agree can affect total fishing catch or effort; and
- ***Allocating the fishing rights among the group of cooperating states [subregional***]: where the quantity inthe cap is divided among the participating states.

All of these options in both the purse seine and the longline fisheries may be considered as policy options for strengthening the property rights characteristics of the authorizations issued to users to fish for tuna. Transferability may not be the first priority among these but would likely be an outcome of incremental progress through the above policy options to strengthen the rights. These options would of course have both costs and benefits for Pacific Island countries and territories, but further study would be needed to estimate these. While this package of options may not lead to exponential growth in economic gains to Pacific Island countries and territories such as seen over the last decade in the purse seine fishery, the aim would be to help generate further efficiency in the fisheries and benefits captured within the region, toward achieving the goals in the Roadmap.

CHAPTER 1: INTRODUCTION

Transform Aqorau, Kamal Azmi, Elizabeth Havice, Stuart Kaye, Stuart Kininmonth, Moses Mataika, Sarah McTee, Anthony Morrison, Lars Olsen, Mark Soboil, Siale Suamalie, Salome Taufa, Alice Thomas-Smyth, and John Virdin

The Policy Context in the Pacific Islands

Governments of the countries and territories in the Pacific Islands region, as represented by the leaders of the 18 members of the Pacific Islands Forum, agreed upon a shared vision and process for cooperation in the 2014 Framework for Pacific Regionalism (Pacific Islands Forum Secretariat 2014). In the context of this vision, the Forum Fisheries Agency (FFA) and the Pacific Community (SPC) led the development of a Regional Roadmap for Sustainable Pacific Fisheries, articulating four goals for the contribution of the region's tuna fisheries:

(1) sustainability of the resource (i.e., stocks of four key tuna species);

(2) increased value to the region from the tuna fisheries, including a greater proportion of the catch by domestically registered vessels and higher economic returns to member countries, through both public revenues from access fees and contributions of the harvest subsector to gross domestic product (GDP);

(3) more employment for nationals of Forum members; and

(4) food security through increased supply of catch for domestic consumption (FFA and SPC 2015, FFA 2018).

This Roadmap was endorsed by the leaders of the Pacific Islands Forum member countries during the 46th Forum meeting in Port Moresby in late 2015 (Pacific Islands Forum Secretariat 2015). Since that time, FFA has provided an annual "report card" on the status of tuna fisheries in the region in relation to the goals in the Roadmap (FFA 2018).

Motivation for Carrying Out This Study

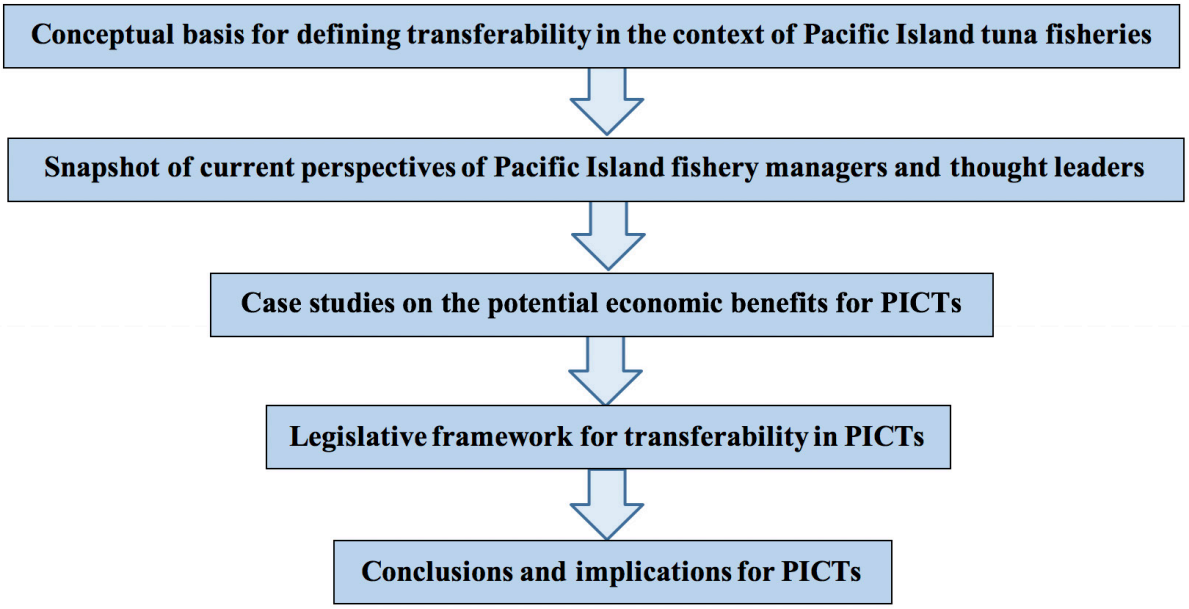
Achieving the goals set in the Regional Roadmap will take a significant effort in fisheries that have been described as some of the world's most difficult to manage effectively (Arnason et al. 2015). Numerous innovations and successes have already occurred, notably cooperation among nine Pacific Island countries and territories to manage access to the purse seine tuna fishery (Aqorau et al. 2018). However, policy makers and fisheries managers within the Pacific Islands region have a complicated and full-time task, which may not always allow the space for analysis of longer-term opportunities and exchange with potentially relevant innovations outside the region. For this reason, the Pacific Catalyst was formed as a consortium of organizations led by the University of the South Pacific aiming to work with the region's governments and fisheries management institutions, in order to foster the development of innovative policy solutions, and to provide a platform to support learning and leadership development for the next generation of fisheries managers.

The Pacific Catalyst consortium is advised by a group of thought leaders in the region (i.e., an advisory board), many of whom are involved in policy making and fisheries management. In 2018, this group suggested that a top priority for longer-term policy analysis and research would be to assess the potential benefits to Pacific Island countries and territories from introducing transferability of tuna fishing access rights. In response, this study was conducted in order to identify options for transferability in the context of Pacific Island tuna fisheries, potential benefits and costs to countries and territories in the region, and key issues that would need to be considered by decision makers in order to develop specific policy proposals. The study does not aim to predict the costs and benefits of specific policy proposals for transferability, but rather to conduct an initial scoping that would allow for such a detailed analysis to take place, and to provide a sound basis of information for policy dialogue in the region. The overarching goal is to provide information that can assist policy makers and fisheries managers in the region to consider this policy instrument, in the context of the goals agreed in the Regional Roadmap for Sustainable Pacific Fisheries.

Roadmap to the Remaining Chapters of the Study

In order to summarize the results of this initial scoping of the potential benefits to PICTs from introducing or enhancing transferability of the tuna fishing access rights that they issue, the first chapter of the study draws upon widely-used concepts and global evidence to date, in order to provide a workable definition of transferability in the context of Pacific Island tuna fisheries, and an analytical framework for measuring the effects of this change in governance. Building upon this conceptual basis, the study provides a snapshot of current perspectives among Pacific Island fishery managers and thought leaders on the topic (Chapter 2), to inform further research and future policy dialogue more broadly. With the concept defined in the Pacific context and current perspectives considered, the study provides cases or thought experiments on the potential economic benefits that could be generated for PICTs from the introduction of transferability (Chapter 3), based on expert judgement of current tuna fishing costs in the region, and publicly available data on tuna fishing effort. Subsequently, the study assesses the current legislative framework for introducing transferability in a sample of PICTs (Chapter 4), to indicate the legal feasibility for countries and territories to move forward with the idea.

Finally, the study concludes by summarizing the implications of this scoping exercise for PICT tuna fisheries policy objectives in the Roadmap and identifies potential further research and next steps for considering the idea further in the region (Chapter 5).



Overview of Methods Used

Development of a conceptual framework to guide the discussion of transferability of tuna fishing access rights in the context of the Pacific Islands. A conceptual framework identifies the main things to be studied in a given system, in terms of the key factors, constructs or variables, and the presumed relationships among them, to help organize information for study and provide a comprehensive understanding of interlinked ideas (Miles and Huberman 1994). In general, conceptual frameworks can be rudimentary or elaborate, theory-driven or commonsensical, descriptive or causal, with some relationships purely logical, while others are empirical (Miles and Huberman 1994). In the context of this study, a conceptual framework provides a lens by which to assess changes in governance of the region's tuna fisheries, and to situate empirical analysis of the specific change of introducing transferability in tuna fishing access rights. It provides a shared language and a common set of relationships and definitions to make complex systems as simple as needed for purpose of analysis (Diaz et al. 2015, Diaz et al. 2011, Ostrom 2009).

This study draws upon the socioecological systems (SES) conceptual framework developed by Ostrom (2009) to support the study of governance—in this case, the prospects related to transferability—over shared resources such as fish stocks. This framework builds upon decades of theoretical and empirical research on the performance of different governance regimes in complex socioecological systems such as fisheries, pioneered at the Workshop in Political Theory and Policy Analysis at Indiana University (Ostrom 2005, 2009). Within this framework, a definition of and description of transferability is articulated, based on economic theory and empirical data on the role of property rights in governing commercial fisheries in general and with particular attention to the complications associated with highly migratory species (Scott 2008, Arnason 2000).

Interviews with Pacific Island thought leaders and tuna fisheries managers on the potential benefits of introducing transferability to the region's tuna fishing rights. Semi-structured key informant interviews were conducted with 21 senior PICT fishery managers and thought leaders to better understand the participant's current state of knowledge on transferability of tuna fishing rights, perceived opportunities and key concerns, particularly the perceived potential economic benefits to PICTs. Key informants constituted 11 senior PICT government fishery managers and advisors (five of whom were from governments who are Parties to the Nauru Agreement), and current and former senior personnel in regional fisheries organizations (e.g., the Western and Central Pacific Fisheries Commission, the Pacific Islands Forum Fisheries Agency, the Secretariat of the Pacific Community and the Parties to the Nauru Agreement Office). The approximately half-hour long interviews were conducted in person and by phone/Skype over the period between December 1, 2018 and July 30, 2019, and in some cases, interviewees responded in written form. During the interviews, participants were asked a series of open-ended questions (see Annex IV for the full list of questions asked). The semi-structured format left room for participants to include further details or perspectives beyond the questions asked. This purposive sampling method was chosen in order to achieve geographic and organizational diversity and a modest saturation of opinions to provide regional perspectives but is not a random sample and therefore should not be considered fully representative of the region's fisheries managers.

Case studies on the potential economic benefits for PICTs from the introduction of transferability. A stylized model was developed to examine the potential economic benefits to be gained from introducing transferability of fishing rights between authorized users in the Western and Central Pacific purse seine fishery, while also considering the tropical longline fishery. To support the case studies, we developed an economic model to measure the financial surplus generated by purse seine vessels by fishing fleet, based on publicly available data and expert judgement by the authors (see Annex II for details). To build the model in the absence of firm level fishing catch and effort data, we estimated average purse seine catch and fishing effort in each of the PICTs based on publicly available catch and effort data from Western and Central Pacific Fisheries Commission (WCPFC) from 2004–2017, by spatially allocating the catch to defined areas and matching these to the zones under PICT jurisdiction, and the total number of fishing days used per each zone, in order to estimate catch by zone and by species. From these values, catch rates by vessel day were calculated to determine overall catch by species for each flag fleet. The number of purse seine vessels operating by country of register (i.e., flag state) and size class was estimated from the WCPFC Register of Fishing Vessels, so that fishing costs could be assessed (based on the size of the vessels fishing from each flag state). Revenues for each flagged fleet were based on the Bangkok market value of catch, while costs were estimated from market prices for fuel expenses, crew salaries, and depreciation cost of a vessel day.

Review of Pacific Island legislation to support the introduction of transferability to tuna fishing rights in the region. The methodology used to review the legislation was traditional comparative analysis of the legal structures in place in the PICTs, Australia, and New Zealand with respect to the licensing of fisheries. The first element was to undertake a collection of all fisheries legislation in the PICTs and then subject it analysis to identify certain salient features, to permit comparison. In this instance the points of comparison focused on the mechanisms

present to potential permit the transfer of a license interest under national fisheries legislation. The second element was to examine closely the legislation structures permitting the transfer of fisheries license interests under Australian and New Zealand law, particularly considering use of a registerable the property interest to affect such a transfer.

Finally, the new personal property legislation of many of the PICTs was considered to determine if such legislation could accommodate its use in the context of fisheries.

CHAPTER 2: THE CONCEPTUAL BASIS FOR DEFINING TRANSFERABILITY IN THE CONTEXT OF PACIFIC ISLAND TUNA FISHERIES

John Virdin, Elizabeth Havice, and Kamal Azmi

Definition of transferability in Pacific Island tuna fisheries rights used for analysis: Tuna fishing rights are defined here as authorizations to access and withdraw tuna from a given space, during a prescribed time period. Transferability of these tuna fishing rights is defined as the extent to which the rights can be divided and traded to others. In highly migratory species fisheries such as tuna fisheries, these rights can be transferable on two different levels: (i) between states and (ii) between users. Transferability can occur between states once they determine a total catch or effort and allocate it among themselves and develop a framework through which participating states can transfer nationally allocated rights among themselves. Transferability can also occur at the level of the user once an individual state allocates the fishing right to individual or specific user groups, who may then trade the rights among users. In the Pacific Islands, transferability of tuna fishing rights between states already occurs within the context of the purse seine and tropical longline Vessel Day Scheme. As such, this study focuses on the implications of also allowing transferability among users, such that individual resource users could transfer the tuna fishing rights issued by PICTs to fish for tuna to other users. This focus on transferability of tuna fishing rights is distinct from the question of "pooling," which refers to states cooperating to change the space to which the fishing rights they collectively issue applies.

The Units of Analysis: Pacific Island Tuna Fisheries, Described as Socioecological Systems

In keeping with the policy goals in the Regional Roadmap, this study focuses on the region's tuna fisheries. In order to define the concept of transferable fishing rights in the region's tuna fisheries, the perspective taken is that these fisheries can be described as dynamic systems, where regularly interacting and interdependent groups of items form a unified whole (Garcia and Charles 2007, Kooiman et al. 2005, Charles 1995, Hilborn and Walters 1992). More specifically, these fisheries can be analyzed using a socioecological systems (SES) conceptual framework, in order to define the variables and interactions that help determine the outcomes sought in the Regional Roadmap, and more specifically, to describe the relationship between introducing a governance change (transferability of tuna fishing access rights) and the outcomes sought by the Roadmap. Essentially, the SES framework is a conceptual framework for studying human-nature interactions such as fisheries, where the changing human condition both directly and indirectly changes fisheries ecosystems (including the fish stocks they support) and where changes in these ecosystems cause changes in human well-being (see Annex I for more detail).

In the context of the Pacific, the PICTs are endowed with access to some of the world's largest tuna stocks,[2] whose range can be defined as the western half of the Pacific Ocean referred to as the Western and Central Pacific Ocean (WCPO) region, covering over 8 percent of the global ocean (Hampton et al. 1999). Within this vast region, four main species of tuna (albacore, bigeye, skipjack, and yellowfin) are targeted commercially, largely in three key fisheries that contribute

directly to human well-being in the region (as defined by the goals set for governance systems in the Regional Roadmap): (i) the purse seine fishery that harvests principally (though not exclusively) from both the skipjack and yellowfin tuna stocks distributed along the equator, (ii) the tropical longline fishery that targets the bigeye and yellowfin stocks distributed along the equator (between 10° N and 10° S), and (iii) the southern longline fishery that targets the albacore stock found in waters south of the equator (representing all longline activities south of 10°S) (Skirtun and Reid 2016, Gillett 2014).[3]

The Role of Fisheries Governance within the Socioecological Systems Framework

The commons problem in socioecological systems like fisheries. In the case of commercial fisheries where profit maximization is considered as the primary goal motivating behavior, the "commons problem" has long been described as a situation where access to the resource is open and multiple fishers compete to catch fish from a given stock, and each fisher maximizes his/her net income by continuing to fish as long as the economic value of an individual's catch exceeds the cost of catching it (Anderson and Seijo 2010). Essentially, the commons problem in fisheries can be summarized as the: (i) rivalry or subtractability problem and the need to limit extraction to levels that match desired replenishment, and (ii) the non-excludability problem, where fishers race to catch the next fish, since what one fisher leaves may soon be caught by the next (Birkenbach, Smith, and Stefanski 2019).

Governance as a solution to the commons problem in commercial fisheries. Within socioecological systems such as Pacific Island tuna fisheries, governance acts as the filter between the human and natural components of the fishery, affecting outcomes (as articulated in the Regional Roadmap). The concept of governance is broad and vaguely defined, e.g., as "the process of steering society and the economy through collective action and in accordance with common goals" (Ansell and Torfing 2016), and characterized in two main components (i) institutions, or the rules, norms and shared strategies that collectively comprise "the rules of the game" that affect human behavior in a given fishery, and (ii) the organizations created by these institutions to administer and enforce them. The institutions and organizations for governance of fisheries operate at multiple spatial scales, from local to national, and from national to international (regional or global), where one institution is nested within a larger institution, which is nested within an even larger institution, etc. (World Bank 2003).

The Role of Property Rights Created by Fisheries Governance

The importance of property rights in solving the commons problem in fisheries. Rules that create property rights for fishing are one of the key institutions driving fishing effort and catch where profit maximization is the/a primary goal (Anderson and Seijo 2010). Such institutions, whether created by the state or nonstate actors, are often characterized as a governance solution to the commons problem in fisheries (Hanna 1999). For this reason, a wide body of literature has emerged in the past two decades on the different forms of property rights created to help governance of socioecological systems (Charles 2011, Charles 2009, Edwards 2003). While it is impossible to summarize all of the work on this topic,[4] this study draws upon the theory of property rights in the governance of common pool resources such as fish stocks, developed by

Schlager and Ostrom (1992), and the characteristics of those rights that enhance their economic value (e.g., as described by Scott 2008).

It is important to first note that while arguments may be made for a particular type of property rights regime, e.g., private property or common property, the empirical evidence suggests that any number of types of regimes can perform well, and be held by many different entities, depending on the cultural, economic, and biophysical context (Hanna 1999). Because their characteristics can be very diverse, it has been said that "property rights, like the dorsal fins on different fishes, come in many different shapes and sizes" (Shotton 2005). The outcomes from this institution of governance are hence always highly contingent upon existing dynamics in the socioecological system in question.

Perhaps most commonly (and traditionally), in order to meet their obligations under UNCLOS, states have formalized fishing rights as licenses for fishing vessels, often in the form of time-limited permits. Government agencies typically issued a license to fish to an individual, or more frequently to a vessel, often with terms and conditions pertaining to a variety of matters relevant to fishing and public interests over the status of the stocks. Such licenses generally specify the details of the stocks able to be caught, the areas from which they were to be caught, the gear to be used, land ports, restrictions on transshipment, dates of operation, etc. Often issued for a duration of one year, the license grants the holder the right to fish, in exchange for a fee paid to the Government (issuing the license).

Concepts and definitions of property rights in fisheries (i.e., fishing rights). Property rights have been defined as a claim to a benefit stream that some higher body—usually the state—will agree to protect through the assignment of duties to others who may covet, or somehow interfere with, the benefit stream (Bromley 1992). Property rights are the product of rules, and are also the corollary of duties, because one participant has an interest protected by a right only when all others have a duty to respect it (Ostrom 2005, Ostrom and Schlager 1996, Bromley and Cernea 1989). Bromley and Cernea (1989) emphasized that "property is not an object (such as fish in the water), but it is rather a right to a benefit stream that is only as secure as the duty of all others to respect the conditions that protect that stream."

Box 1. The Concept of Property Rights

Property is centrally important in everyday life and is a central concept in politics and law. It has long been central in debates over the challenges and right approach to fisheries management. Despite the centrality of property, it is usually assumed what property is and discussion quickly turns to questions of the right property system to put in place and/or the desirability of various forms or modes of ownership. Approaches to property tend to fall into several different tropes. The first is property as "things," an approach that garners much cultural and rhetorical power, but that fails to recognize that property only has meaning when relationships about that thing are put into play (e.g., conflict over the thing in question). A more sophisticated approach is based on the idea of property as involving claim—rights, privileges, powers, and immunities (Hohfeld 1913), an approach that benefits from its inclusiveness. Now the most common legal approach sees property as rights, rights in or to things (MacPherson 1983), or legal relationships between persons with respect to things.

While difficult to establish the content that distinguishes property rights from other rights, scholars have identified an underlying organizational structure that property rights distinctively share, reflecting their multidimensional nature (Underkuffler 2003). The four dimensions of property described by Underkuffler (2003) are used here as an organizing structure for comparison: theory, space, stringency, and time. If property is the rights, privileges, powers, and immunities granted over the tangible and intangible things of the world, these four dimensions elaborate the contours of property as a concept and practice. Attention to these underlying structures allows for precision in the meaning and power of property that will be useful in assessing the effects of changes to these rights as relates to fishing and the transferability of fishing rights.

The first dimension of property is theoretical, and it describes the theory of the particular right that is used for any conception of property. It recognizes that—with regard to private property in particular—that some theory of individual rights must be adopted for a legally cognizable idea of property to have meaning. While there are of course many theoretical approaches to understanding and defining property, the selection of an approach is a critical choice. For this assessment and dialogue on property rights in Pacific tuna fisheries, the approach developed and described by Schlager and Ostrom (1992) for governance of common pool resources is suggested here, based on the large body of empirical research behind it, and synthesized in the following paragraphs.

In the approach described by Schlager and Ostrom (1992), the theory of property centers on defining and distinguishing among different bundles of rights held by the users of a resource (within a socioecological system). In the socioecological system, rules create property and are understood to be generally agreed upon and enforced prescriptions that require, forbid, or permit specific actions for more than a single individual (Ostrom 1986). "Rights" are the product of "rules," and thus are not equivalent to rules. Rather, "rights" refer to particular actions that are authorized (V. Ostrom 1976). A property right is the authority to undertake particular actions related to a specific domain (Commons 1968). For every right that a user holds, rules exist that authorize or require particular actions in exercising that property right. Furthermore, all rights have complementary duties: to possess a right implies that someone else has a commensurate duty to observe this right. Thus, rules specify both rights and duties: a user may be granted a use right to extract a certain volume of fish, or to exert an amount of effort in attempting to catch fish, but the user is also generally bound by duties that limit activities and the requirement to respect the rights of others. For instance, those with use rights are required to follow gear and effort restrictions, time closures on fish aggregation devices (FADs), and to follow all national and flag state regulations.

Schlager and Ostrom (1992) distinguish between operational level rights and collective choice level rights. This distinction reveals the difference between *exercising* a right and *participating in the definition* of future rights to be exercised. The operational level involves two kinds of "rights":

- *Access:* the right to enter a defined physical property
- *Withdrawal:* the right to obtain "products" of a resource (e.g., catch fish)

The collective choice level contains three kinds of "rights":

- *Management:* the right to regulate internal use patterns and transform the resource by making improvements. Individuals who hold rights of management have the authority to determine how, when and where harvesting from a resource may occur, and whether and how the structure of a resource may be changed.
- *Exclusion*: the right to determine who will have an access right, and how that right may be transferred. Individuals who hold rights of exclusion have the authority to define qualifications that individuals must meet in order to access a resource.
- *Alienation*: the right to sell or lease either or both of the above collective choice rights. The right of alienation is a collective choice right permitting its holder to transfer part or all of the collective choice rights to another individual or group. Exercising a right of alienation means that an individual sells or leases the rights of management, exclusion or both. This essentially refersto the authority to sell or lease collective choice rights.

Arraying these rights as shown in Table 1 below reveals distinctions among four classes of property-rights holders related to fisheries: owner, proprietor, claimant, and authorized user. The five property rights are independent of one another, but in relation to fisheries, are frequently held in a cumulative manner, i.e., a "bundle of rights." It is possible to have entry rights without withdrawal rights, to have withdrawal rights without management rights, to have management rights without exclusion rights, and to have exclusion rights without the rights of alienation. Of course, while theoretically possible, in practice holding entry rights without withdrawal rights rarely occurs (Schlager and Ostrom 1992).

Table 1. Bundles of Rights Associated with Positions

	Owner	Proprietor	Claimant	Authorized User
Access and Withdrawal	X	X	X	X
Management	X	X	X	
Exclusion	X	X		
Alienation	X			

Source: Schlager and Ostrom (1992)

Different bundles of property rights affect the incentives individuals face, the types of actions they take, and the outcomes they achieve, including for stewardship of a resource (with the full bundle conferring ownership likely to create the strongest incentive for stewardship). Ownership alone, however, does not guarantee the survival of a resource. Clark (1973, 1974) showed that owners may still destroy a resource if they use a relatively high discount rate.

Schlager and Ostrom (1992) write that owners and proprietors aim to be rewarded for incurring the costs of investment in processes such as fisheries management and rules restricting fishing effort and catch.

Such investments are likely to take the form of devising withdrawal rights that coordinate the harvesting activities of groups of owners or proprietors in order to avoid or resolve the commons problem. Owners and proprietors devise access rights that allow them to capture and maximize the benefits (economic and/or ecological and social) produced by the withdrawal rights (Schlager and Ostrom 1992).

Conversely, Schlager and Ostrom (1992) suggested that "authorized users" are individuals holding operational-level rights of access and withdrawal. If specified in operational rules, access and withdrawal rights can be transferred to others either temporarily, as in a lease arrangement, or permanently when these rights are assigned to others. Of note, transfer of these rights may be specified in the rules but is not equivalent to alienation of management and exclusion rights. The rights of authorized users are defined by others who hold collective-choice rights of management and exclusion. Authorized users lack the authority to devise their own harvesting rules or to exclude others from gaining access to fishing grounds. Even though authorized users may be able to transfer (e.g., sell) their fish harvesting rights, they lack the authority to participate in collective action to change operational rules (Schlager and Ostrom 1992).

Authorized users possess no authority to devise their own rules of access and withdrawal, even if they may transfer those rights to other users. Their outcomes are dependent primarily upon the operational-level rights that others define for them. Whether the incentives they face induce them to act so as to achieve efficient outcomes depends upon the institutional design skills of those who hold the collective choice rights. Since authorized users do not design the rules that they are expected to follow, they are less likely to agree to the necessity and legitimacy of the rules. Authorized users may engage in a game with rule enforcers, seeking to gain as much as possible. This leads to an overinvestment in the fishery and suboptimal economic outcomes (Schlager and Ostrom 1992).

Each of the above types of rights is independent of the others, but they are frequently held in a cumulative manner, i.e., "bundles" of rights akin to a "bundle of sticks" (Schlager and Ostrom 1992, Ostrom and Schlager 1996). The more rights held in the bundle, the better defined the "property" rights are—i.e., someone who holds all five rights would be considered an owner, while someone who only holds the first right an authorized entrant (Schlager and Ostrom 1992). Theoretically, the more "sticks" in the bundle, the stronger the incentives for efficient use of the resource over time because there is coherence between both efficiency and equity to future generations. Conversely, the less defined the property right is for users, the weaker the incentives—as no incentive to conserve exists without the assurance that resource units saved today will be available for use at a later time by one who conserves (Ostrom and Schlager 1996). A number of empirical studies of common pool resource users found that those who had management and exclusion rights as well as access and withdrawal rights, had developed rules that enhanced cooperation and helped to solve the commons problem (Ostrom and Schlager 1996).

The second dimension of property is space. The theory of property is only meaningful when we know to what the theory is to be applied: an understanding of the space, or areas of field to which the theoretical dimension applied (Underkuffler 2003). The spatial dimension of property seems readily adaptable to land—that is, if a distinct and bounded "thing" is the subject of the property right, this dimension will not have a visible impact upon the concept of property. However, in the case of fish stocks and particularly highly migratory fisheries such as Pacific tuna fisheries, mobility of the "thing" (the fish) complicates the area of field. What are the physical boundaries of a school of fish, and how is the theory of rights implemented when there are multiple "owners" (in the case of highly migratory fish, multiple states) (see e.g., Havice 2018)? Defining the space or conceptual area of field to which the theory of rights applies is essential for the conceptual and functional application of property.

The third dimension of property is the stringency (of protection). Once the theory and area of field is in place, one can begin to define the structure of property, which might range from the "absolute right to exclude" to the "right to use subject to reasonable regulation"—the latter of these is most common in fisheries. The dimension of stringency relates to how and to what degree the right is protected. Stringency of protection may be evident in the different protection afforded to different kinds of rights, and/or may be dependent upon the kinds of things that are the objects of those rights and may be afforded more or less stringency based on the different contexts in which rights appear (Underkuffler 2003).

The fourth dimension of property is time. This dimension addresses the question of at what moment or point in time is the content of the dimensions of property determined. And is that content, once determined, fixed and unchanging, or does it vary thereafter (Underkuffler 2003)? The question of time has proved particularly important in natural resource sectors as, for instance, new scientific information about population dynamics, shapes and forces changes in understanding of property rights and might lead to calls to change the structure of rights. In the case of fisheries, for instance, changing environmental conditions might lead to calls to capping capacity or total catch. Once the start time of the right is determined, it must also be determined if the right will remain fixed thereafter, and if not, what parameters will determine if and when it is altered and what kinds of alterations are reasonable (Underkuffler 2003).

These four dimensions of property can be summarized as in Table 2 below and utilized to assess proposals for introduction of new property relations or alterations to existing governance schemes, and as such as useful to an examination of the potential to introduce transferability into tuna fisheries in the WCPO (see Table 6 below).

Table 2. Summary of the Dimensions and Characteristics of Property Given Here

Dimension of Property	General Definition in this Report
Theory	Schlager and Ostrom (1992): Property rights defined in terms of the users, with atrributes that are cumulative as if held by users in a bundle (the more attributes, the stronger the bundle), the rights of: access, withdrawal, management, exclusion and alienation
Space	Spatial dimension of property rights: to what is the theory applied
Stringency	How and to what degree the property right is protected, often linked to compliance
Time	At what moment or point in time is the content of the dimensions of property determined

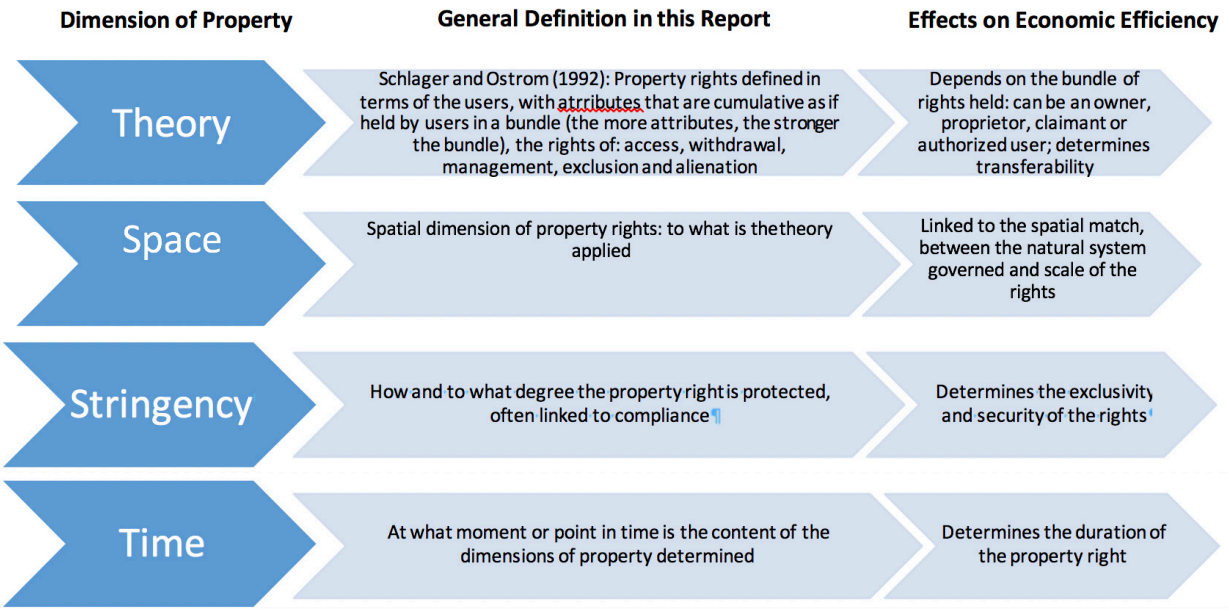
Sources: Underkuffler (2003), Schlager and Ostrom (1992)

Forms of fishing rights frequently observed to enhance efficiency in fisheries. From within this organizing framework for describing property rights in fisheries or fishing rights (Table 2 above), economists have long studied the specific forms of the rights described above that have most effectively increased efficiency in fishing and better aligned the economic incentives of resource users with stewardship to solve the commons problem (Costello et al. 2008, Beddington et al. 2007, Grafton et al. 2006, Hilborn et al. 2005, Sterner 2003). Essentially, economists have studied those characteristics of fishing rights that help ensure that resource units saved today will be available for use at a later time by the user who conserves (and incurs the opportunity cost) (e.g., Scott 2008, Arnason 2007, Pearse 1980).[5] This reflects the broader economic literature on institutions, emphasizing that property rights determine the opportunities for efficiency in productive activities, and therefore the generation of economic benefits (North 1990). Or similarly stated, the efficiency of any production activity depends positively on the property rights in the inputs and outputs associated with that activity (Arnason 2007).

Essentially, the stronger these characteristics are in the definition of the rights, the more likely a right or bundle of rights as defined by Schlager and Ostrom (1992) will be to create economic incentives for stewardship, enhancing efficiency and economic outcomes (e.g., from an economic perspective, the stronger or thicker each stick in the bundle is). Conversely, if one or more of these characteristics is attenuated, the net economic benefits may be diminished (Grafton et al. 2000, Arnason 2000).

In summary, the forms of fishing rights defined within the framework summarized in Table 2, would be expected to affect the efficiency of fishing operations and hence economic outcomes, as shown in Table 3 below.

Table 3. Linking the Dimensions of Property Rights to Economic Efficiency in Fishing



Sources: Underkuffler (2003), Schlager and Ostrom (1992), Scott (2008), Grafton et al. (2000)

Of note, within the "theory" dimension of property, the transferability of the fishing rights in the bundle is specified, contributing to their effect on economic efficiency in the fishery. In some cases, scholars have proposed scoring systems to qualitatively assess the presence of these characteristics of fishing rights, as a predictor of efficiency outcomes. For example, Arnason et al. (2015) propose a scoring system for the strength of the rights based on these four characteristics, as well as "flexibility," and similarly the Environmental Defense Fund (EDF) has proposed a "SEASALT[6] tool" to score the strength of the rights based on similar characteristics (e.g., ranking the extent of security, duration, exclusivity, and transferability provided by the fishing rights).

A focus on the characteristic of transferability in fishing rights. As mentioned previously, the extent to which a property right can be divided and traded to others is part of the theory of fishing rights (see Tables 2 and 3) and considered by economists to be a critical characteristic for governance of fishing, helping to determine the efficiency from the activity and hence economic outcomes for the fishery overall (Costello et al. 2008, Grafton, 1996). This is because transferability of fishing rights is theorized to allow users (i.e., the fishing industry) to restructure in response to changes in technology, markets, resource conditions, and the environment. More specifically, transferability utilizes a market mechanism to ensure that marginal benefits and costs are equalized in the fishery (Sterner 2003), for example if one economic agent can harvest

an increment of fish more efficiently than another, but lacks the right to carry out that additional harvesting, it could purchase the right from the less efficient agent and increase its profits as well as the overall static (and dynamic) efficiency of the fishery (Townsend et al. 2008). Another example would be if an economic agent's fishing vessel experiences maintenance problems (or simply wants to take a vacation), that agent can transfer its fishing right to another who could use it profitably (Townsend et al. 2008). Similarly, an economic agent in the post-harvesting segment of the fishery may wish to reduce the risk of not meeting a large supply commitment by acquiring fishing rights that can help ensure supply (Townsend et al. 2008). Transferability of fishing rights has analogs in the management of other common pool resources, e.g., transferable grazing rights, water rights, development rights for land use, etc. (Sterner 2003).[7] Similarly, in the use of these different resources, rules may create transferability of different rights within the bundle described by Schlager and Ostrom (1992), e.g., the resource owners permit transferability access and withdrawal rights but not management or exclusion rights.

Box 2. "Cap and Trade" Schemes in Pollution Reduction: Examples of Transferability

The regulator sets a limit on pollution (the "cap"), analogous to a total limit on effort or catch in a fishery (i.e., a total allowable effort or total allowable catch). The cap may be present without transferability (the "trade"), as transferability does not affect the limit, but rather how much it costs firms to comply with it. In the United States in the 1990s, pollution reduction programs generally moved toward cap and trade schemes, based on regulators first determining the total quantity of allowable emissions, and then typically auctioning emissions rights to polluters (or basing allocations on historical use or some other mechanism not related to current output). After allocation, the rights became subject to free trading among the polluters that owned them (Sterner 2003). Similarly, in fisheries, when the cap on fishing is set as a total allowable catch, the percentage of that catch may be allocated to resource users (as withdrawal rights typically described as "quota"). In some cases, access rights may also be defined, e.g., a user may hold a withdrawal right (quota) to a portion of the total allowable catch in perpetuity or for a long duration, but be required to purchase an access right each year to use it (e.g., an "annual harvesting right"). Resource owners may permit transferability among different rights, e.g., of the withdrawal right (quota), but not the access right (annual harvest rights), etc.

Transferable fishing rights for migratory fisheries. In terms of highly migratory fisheries such as for tuna, developing and allocating fishing rights that are transferable unfolds in several steps, reflecting the complexities associated with assessing and regulating stocks that span waters under the jurisdiction of multiple countries and are used by a wide range of harvesters (hosted in multiple countries). The basis for creating these fisheries governance institutions is the legal regime established by the United Nations Convention on the Law of the Sea (UNCLOS), together with its implementing agreement, the 1995 United Nations Fish Stocks Agreement (UNFSA), and the guidance provided to utilize the UNCLOS regime by the nonbinding Code of Conduct for Responsible Fisheries (Cochrane 2009, Kuemlangan 2009). As the "constitution for the sea," UNCLOS created the legal framework for all activities in the oceans and seas and established the rights and obligations of states within the different maritime zones (Wang 1992). The treaty established a new maritime zone beyond states' territorial sea, the exclusive economic zone (EEZ),

which can extend up to a limit of 200 nautical miles from the baselines from which the breadth of the territorial sea is measured. In the EEZ, coastal States have "sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or nonliving, of the waters superjacent to the seabed and of the seabed and its subsoil, and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds" (Wang 1992, UNGA 1982).

The UNFSA expanded upon the legal regime created by UNCLOS for "highly migratory" fish stocks or "straddling" stocks that occur both within countries' EEZs and in the adjacent waters (i.e., "high seas") (United Nations 1995). The Agreement designates regional fisheries management organizations (RFMOs) as the primary vehicle for cooperation between states to formulate rules for access to and use of such highly migratory or straddling fish stocks (United Nations 1995). Coastal states in the area of the fishery and distant water fishing nations with an interest in the fishery are RFMO members, and according to provisions in UNCLOS and the UN Fish Stocks Agreement, they must collaboratively engage in management.

Several RFMOs have facilitated cooperation between states to develop rules creating fishing rights for a limited catch, including for tuna fisheries, typically at the level of states, and individual users (Squires et al. 2013). For instance, the International Commission for the Conservation of Atlantic Tunas (ICCAT) defines a total allowable catch (TAC) for bluefin tuna, which is then allocated to member countries before each country develops its own method for allocating fishing rights to firms. There are also several cases in which regional groupings of countries have developed property rights-based approaches to limiting and governing fish catch, which are then recognized by and incorporated into an umbrella RMFO framework.

In cases where countries have cooperated to create transferable fishing rights for highly migratory species, they have typically undertaken the following steps detailed in Allen et al. (2010). Through these steps, countries determine an overarching catch or capacity control and then allocate it among members of the group, analogous to a "cap and trade scheme" (see Box 2).

(1) ***Setting the cap on fishing.*** The group of states develops a limited entry scheme, creating what Allen et al. (2010) refer to as a form of "international common property" that is held and allocated through collective interstate procedures (often an RFMO). The group determines an approach to fishing limits (e.g., input- or output-based restrictions), and an overall limit to achieve a clearly stated goal (e.g., biological sustainability defined and quantified in terms of maximum sustainable yield). It is worth noting that in the context of international management, the negotiation over the definition of the stated goal, as well as the relationship between political decision makers and scientific bodies providing management advice can be highly complex (see, e.g., Boustany 2019, Collette 2017).

(2) ***Allocating the fishing rights among the group of states, within the cap (i.e., total limit).*** When a catch or effort limit is set, this quantity is then divided and distributed among users. The groups must then decide if it will allocate those limits to states, or bypass states and allocate rights directly to individuals (Squires 2010). This allocation

process provides the allocated entity (which in the first instance is an individual state) the right to harvest a defined proportion, either an absolute amount or a percentage of the total limit, within a given period of time, such as a year or season (Squires 2010). In this case, members of the group must develop a mechanism for determining which states receive allocated rights, and the amount of rights each state receives.

(3) ***Member states allocate fishing rights (for access and withdrawal) to authorized users.*** Once cooperating states have determined a total limit and allocated it among members in the group, each then generally allocates catch or effort to individuals or groups within their state. States may take a range of tactics, ranging from derby style use of rights (i.e., first come first served) to the use of formulas that specifically allocate rights to individuals or firms. In the latter case, the specific allocation of rights leaves the opportunity for transferability open. Frequently, allocation processes and the terms and conditions of allocation to individuals or firms are highly confidential, making it difficult to describe allocation to private sector actors in detail (for an example, see: Silver 2019). The sum of this process is described as a multi-stage allocation.

(4) ***States allow for transferability (i.e., trading) at one or both levels, between states in step two above, and/or between authorized users in step three above.*** When it is then possible for states or users to "transfer" through trading, purchase or some other mechanism, to another user, the right can be described as transferable. Transferability can enter at both stages of allocation, i.e., at both the national level and the user level. That is, once countries determine a total catch or effort and allocate it among themselves, they might also develop a framework through which states can transfer nationally allocated catch among themselves (either retaining the fishing right but allowing another state to use it, or permanently transferring the right originally allocated to the state). Likewise, once an individual state allocates catch or effort rights to individual or specific user groups, those groups might also develop a framework to trade catch or effort rights among users (e.g., between firms and/or between vessels within a firm). In either case, transferability is conceptualized as creating "stronger" rights and offering opportunities for greater incentives for user groups. For instance, as Allen et al (2010) outline, catch quotas create economic incentives for fishers to harvest their catch shares at the lowest cost to increase the value of their landings. Coupling this with transferability allows the most efficient fishers to harvest greater shares of total catch, raise economic efficiency and productivity.

Of note, the allocation decisions that states make in RFMOs or other regional cooperative arrangements are critical because if they are durable over time, countries inevitably view their allocations as a quasi- property that they are entitled to maintain into the future (Serdy 2016, Van Dyke 2010, Webster 2010). Principles outlined in international law indicate that allocation processes should be equitable, efficient and take into consideration factors such as historical fishing and the economic needs of developing coastal and island states (ISSF 2011a, 2011b, Van Dyke 2010). Allocation decisions are also a mechanism for distributing wealth among user groups (Libecap 1989). Given that allocation processes can be highly politically contentious in

multilateral contexts and within an individual state, allocation is also key to the institutional stability of the inter-state fisheries governance regime (E. Havice 2018, In preparation). In some instances, these decisions are determined through an allocation formula that is agreed upon by participating states. In other instances, allocations decisions are determined by interstate negotiations, which draw upon and appeal to the principles outlined in international law but are not solidified. This is the case for allocation of quota to Atlantic Bluefin tuna at the International Commission for the Conservation of Atlantic Tunas (Serdy 2016).

In terms of transferability in the process described above, the transfers also can in theory be used to target overcapacity, because transferability suggests that the market-based mechanisms will lead catch quota or effort to end up in the hands of the most efficient vessels and lead to less efficient vessels falling out of the fishery. This of course has been critiqued from several perspectives. For one, fishing effort is a multidimensional variable and restricting just one component, e.g., fishing days, leads to expansion in other components, e.g., vessel efficiency (Arnason et al. 2015, Squires et al. 2016, Squires et al. 2017, Smith 2019). Another concern is from a distributional perspective: consolidation of fishing rights holders can lead to suboptimal social outcomes, particularly if operating costs are uneven because of subsidies and other forms of state supports in a competitive and multi-state fishery (Squires et al. 2014, Cisneros-Montemayor et al. 2020). Hence, there are tradeoffs inherent in the extent to which transferability of different types of fishing rights is permitted: e.g., the greater the transferability the more efficiency would be expected to be increased, but also the greater the consolidation expected and subsequent effects on social outcomes, among others. To address these concerns states may permit transferability only on a limited basis, i.e., including barriers to trading, such as concentration caps that prohibit any one authorized user from acquiring more than a given percentage of the access and withdrawal rights issued, though of course with an opportunity cost of foregone efficiency gains.

Box 3. Transferability of Fishing Rights at the National Level within RFMOs

Serdy (2007, 2016) has examined the legal issues surrounding transferability specifically of quotas among members of RFMOs. Some RFMOs already allow for quota trading among states, and any such system depends on decisions of the RFMO concerned. The type of right to emerge in a tuna RFMO also depends on the bargaining positions taken by the different member and cooperating nonmember states. These positions depend on their expected gains from institutional change. In principle, each party will attempt to shape the nature of the right to give it the greatest share of the aggregate gain (Libecap 1989). Players compare expected gains to their current returns under the status quo (R. Allen, W. Bayliff, J. Joseph, & D. Squires 2010).

Source: Allen et al. (2010)

Application of These Concepts to Western Pacific Tuna Fisheries

Overview of the current governance system for each of the three tuna fisheries, and the fishing rights created. This section provides a brief overview of the current institutions (in this case formal rules) and organizations created to administer them, that regulate tuna fishing effort and catch in the three Pacific tuna fisheries.

At the regional level, based on the framework provided by UNCLOS and UNFSA, all three of the Pacific tuna fisheries under consideration here are governed in part through the institution of the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean, opened for signature in 2000 and entered into force in 2004.[8] This agreement resulted from six years of complex negotiations between PICTs and distant-water fishing nations, creating a Western and Central Pacific Fisheries Commission as an RFMO to administer the agreement that currently includes 26 member countries, 7 participating territories and 7 cooperating nonmembers, and covers the entire WCPO (WCPFC 2015). The RFMO is a forum that takes decisions on the basis of consensus, in order to regulate fishing effort and catch to overcome the commons problem and ensure the long-term conservation and sustainable use of the tuna stocks, among others (WCPFC 2015). At this level, following Schlager and Ostrom's (1992) theory of property rights and the dimensions given in Table 2, the RFMO is essentially somewhere between a claimant and a proprietor, being able to authorize access and withdrawal to the highly migratory stock and to take management measures, but perhaps limited in its capability to exclude nonparticipants (given that members must self-police and new entrants with an interest in the fishery cannot be excluded). Authorizations for access and withdrawal typically take the form of total limits on fishing catch, effort and/or activity at the national or fleet level, for specification by members.

At the subregional level, seven PICTs (and subsequently an eighth, Tuvalu) in the equatorial belt where the highest concentration of purse seine fishing occurs, signed the Nauru Agreement in 1982, to harmonize management of fish stocks shared across their EEZs (PNA 2010). The PICTs who signed the Agreement, i.e., the Parties to the Nauru Agreement (PNA), agreed to work together to set uniform terms and conditions of access to the tuna in their waters, including licensing, reporting, identification, etc. (World Bank and Nicholas Institute 2016).

Over the years this cooperation gradually shifted from a focus on public investment to harmonized rules for access and withdrawal in the purse seine fishery, particularly in the period from 2000 to 2006 when the countries explored specifying access and withdrawal rights in terms of the total number of days fished instead of the total number of vessels licensed (Gillett 2014). As a result of this exploration, in 2006 the PNA amended the Palau Arrangement9 in order to create a Vessel Day Scheme (VDS) to regulate purse seine tuna fishing access. Through the VDS, the Parties meet each year to set a total collective limit on purse seine fishing days in their EEZs10 for the year (the total allowable effort or TAE), based on the best scientific information and advice available, and allocate that TAE among the Parties (the Party allowable effort or PAE) using a formula that combines a measure of EEZ productivity and effort and catch history (Aqorau 2009).11 The TAE is defined as the maximum number of fishing days by all licensed purse seine vessels in the EEZs of the Parties, in any management year (i.e., calendar year), while the PAE is defined as the total number of fishing days for a management year allocated to that Party pursuant to the Palau Arrangement (PNA 2016).

Under the VDS, all Parties agree to limit fishing effort authorized in their waters to the respective PAEs, using standard criteria for reporting fishing days, and to sell these days at a minimum price to avoid downward competition between states for users (essentially, resource owners operating as a cartel with monopoly characteristics, given jurisdiction over waters that typically

yield over a third of the world's tuna catch).12 In practice, with this level of cooperation in the purse seine VDS, competition between states for users is relatively limited, as many domestically registered fishing vessels (users) are limited in distance, while foreign-registered vessels may be similarly constrained by proximity to processing or transshipping facilities to support value chains. Similarly, for the tropical longline fishery, the PNA amended the Palau Arrangement in 2014 to establish a VDS for the longline fishing effort they authorize in their EEZs, aiming to enhance "the management of longline fishing vessel effort in the waters of the Parties," under similar terms as the purse seine VDS (World Bank and Nicholas Institute 2016, PNA 2015).[13]

To administer the purse seine and subsequently the tropical longline VDS, the PNA initially utilized the Pacific Islands Forum Fishery Agency (FFA), but in 2010 the Parties amended the Agreement to establish the PNA Office (PNAO). The PNAO currently administers the VDS for both fisheries, performing any functions required by the Parties to administer the scheme, including convening meetings of the Parties, maintaining a register of vessels eligible to fish in Parties' waters, and supporting monitoring of purse seine fishing days used by each Party as well as fish catch by maintaining the web-based Integrated Fisheries Information Management System (iFIMS).[14]

While the purse seine and tropical longline fisheries are the subject of cooperation by the PNA, the southern albacore fishery is south of the equator and includes a different set of actors. Among these actors, in 2014 ten states15 signed the Tokelau Arrangement to cooperate for shared management of the albacore fishery occurring in the waters, by introducing fish catch limits on albacore by EEZ, following loosely on the model of the VDS, whereby limits on access for the fishery would be introduced via national rules in each of the participating countries (Havice et al. 2014).16 The approach was similar to a "cap and trade scheme" and more specifically the VDS, except that withdrawal rights for users would be specified in terms of catch, rather than fishing effort (i.e., fishing days).17 The Parties asked the Pacific Islands Forum Fisheries Agency (FFA) to administer the Tokelau Arrangement, and support the states to meet at least once annually in order to take decisions by consensus (World Bank and Nicholas Institute 2016).

At the subregional level, the PNA essentially functions as a proprietor on behalf of its members, setting rules for access and withdrawal of tuna from the waters collectively under its jurisdiction, as well as having the right to manage and exclude. In the case of the purse seine and tropical longline VDS, the access and withdrawal authorizations are specified in a total number of fishing days (PAE) that can be issued by each member.

At the national level, states issue the authorizations to access and withdraw tuna from the waters within their EEZs directly to individual users, via licenses with minimum fees collected as taxes and a number of duties or requirements (e.g., to report catch, avoid by-catch, etc.). For the purse seine and tropical longline fisheries, the states are issuing these authorizations as part of the subregional VDS, setting a total cap on fishing effort at subregional and national levels, and issuing portions of that cap to individual users in the form of fishing days. Generally, there are a range of ways that rules specify fishing effort limits, e.g., technical measures (gear restrictions), input controls (e.g., through licensing), output controls (e.g., a total allowable catch), or portions of a total cap, e.g., effort quotas (Charles 2009). On this basis, the rules created under the VDS for

the two fisheries can be characterized here as individual effort (IE) regimes in each PICT, from the perspective of the resource users, rather than individual quota (IQ) for example.

Theoretically, such effort rights create weaker economic incentives for users to overcome the commons problem than catch rights, since these rights can be expected to lead to increases in effective effort ("effort creep")—a measure of the actual effect of fishing on the stocks (e.g., fishing mortality)—as they gravitate towards more efficient vessels (Squires et al. 2017). However, in some cases the costs of monitoring compliance with the rules may be much lower for an effort-based regime than one based on quotas requiring verification of landings and catch composition, e.g., nominal units of effort may be cheaper to monitor than catch, particularly in fisheries where transshipping occurs and fish are landed at multiple sites across countries (Squires et al. 2017). Hence, effort-based regimes may be more appropriate for some fisheries than a system that authorizes the resource user to a portion of the catch, depending upon the relative size of the transaction costs (e.g., monitoring and enforcement of compliance) and the residual inefficiencies (Townsend et al. 2008). Currently the purse seine VDS uses conversion factors to make continuous adjustments aiming to ensure that nominal effort reflects the harvesting capacity of the fishing vessel, by adjusting days based on the size class of the vessel (e.g., longer vessels may be accounted as using 1.5 days for every one day fished) (Havice 2013).

In terms of the fishing rights created at the national level, as a result of UNCLOS, states are the only entities that have all five types of property rights in the bundle described by Schlager and Ostrom (1992), functioning as resource owner. Hence, in the governance of Pacific tuna fisheries (from the systems perspective of a SES framework), the only formal entity with the characteristics of resource ownership are PICTs. They hold the strongest property right for tuna fishing within the system, as the only entity with all the characteristics of property equivalent to resource owner. Of course while much literature and practice focus on property relations in EEZs (Shotton 2005), property rights have existed in traditional fishing communities long before UNCLOS (Cordell 1989), including in Pacific Island communities where common property over defined resources was exercised and use rights allocated within the group of eligible users, and/or technical measures fixed (Johannes 1978, Ruddle 1988).

In conclusion, the current governance of fishing effort and catch in the Pacific tuna fisheries can be summarized as providing the following types of property rights, with various common characteristics (based on Table 2 and emphasizing the characteristic of transferability, as discussed in section 2.3), as shown for the VDS (applicable to both the purse seine and tropical longline fisheries) in Table 7 below.

Table 4. Overview of Fishing Rights in the Purse Seine and Tropical Longline VDS

	Theory (e.g., type of rights holder)	Spatial Coverage	Stringency	Time	Transferable (yes/no)
Regional	Western and Central Pacific Fisheries Commission (WCPFC) = claimant/ proprietor (specifies rules for states, fleets)	WCPO (100% match)	Low	Unlimited	No transfers between RFMOs
Sub-regional	PNA = proprietor (specifies total effort, and portion allocated to members)	9 EEZs (purse seine ~75% of the fishery; longline ~30% of the fishery)	Medium	PNA total allowable effort determined annually. Right to utilize fishery held in perpetuity.	No transfers between subregional groups
National	PICTs = resource owner (specifies individual effort authorizations, as fishing days)	PICTs issue access rights for EEZs*	High	The formula for Parties' allowable effort not fixed, and must be recalculated each year, though PICTs' rights to fish resources in EEZs held in perpetuity	Yes, transfers allowed between PICTs of fishing days authorized for a given year, but not of perpetual rights
User	Individual entity (e.g., fishing companies) = authorized users	Authorization for specific EEZ only	High	1 year	No

Note. Cells shaded in red are highlighted as particular characteristics of rights that could be strengthened. *In some cases, the Parties to the Nauru Agreement (PNA) have cooperated to issue individual effort authorizations to vessels, for a space larger than any one EEZ, but for the space equivalent to their collective EEZs.

Table 4 highlights a number of the dimensions or characteristics of the property rights created for tuna fishing in the Pacific. At these various scales, possible opportunities where changes could enhance efficiency for resource users and hence overall economic outcomes have been identified (World Bank and Nicholas Institute 2016, Arnason et al. 2015), e.g.:

- *National*: Changing the space for which the authorization applies (i.e., "pooling"), a change PNA members have already begun to test;
- *National*: Changing the allocation formula for PAEs, so that Parties have their share with a permanent duration;
- *Resource user*: Extending the duration of the authorization for resource users to fish, e.g., issuing fishing days that could be used over multiple years; and
- *Resource user*: Allowing resource users (economic agents, e.g., fishing companies) to transfer (i.e., "trade") their authorization to fish, i.e., to transfer their fishing days to other users.

Of course, any of these changes would be a policy decision by PICTs. To inform consideration of at least one of the options, the following section describes the last point above in more detail.

This option is the subject of this study on transferability: changing the authorizations issued by PICTs to fish for tuna (i.e., tuna fishing rights), such that individual resource users could transfer these rights to other users. As shown in Table 4, transferability of the use of tuna fishing rights already exists at the national level between PICTs who are Parties to the Nauru Agreement (for the duration defined in the right: one year), though this could potentially be expanded to include more PICTs. Note that a PICT do not transfer the sovereign rights established under its EEZ, but rather permits other PICTs to issue its annual authorization for users (i.e., fishing days). However, because transferability of tuna fishing rights between authorized users does not yet formally exist within the three tuna fisheries in the Pacific Islands region, this study largely focuses on the potential of this new policy instrument.

Of note, based on Table 4 this discussion of transferability of tuna fishing rights at the level of resource users is distinct from the question of transferability of tuna fishing rights between states (already in practice in the VDS for the annual authorization of effort),[18] and distinct from the question of "pooling," which refers to states cooperating to change the space to which the fishing rights they collectively issue applies.

Defining the option of adding transferability to Pacific tuna fishing rights. As mentioned previously, transferability of tuna fishing rights (i.e., fishing days that can be used within a given calendar year) currently occurs only in the purse seine VDS at the national level, on an ad hoc basis between PICTs who are Parties to the Nauru Agreement. Parties may transfer (e.g., sell) any unused portion of their PAE to other Parties (though not to states that are outside the PNA) (Arnason et al. 2015). However, there are constraints on these transfers. Arnason et al. (2015) note that because the formula for calculating the PAE is based on an average of the actual fishing effort in a Party's EEZ and the moving average of the biomass in Parties' waters (Havice 2013), then Parties could have a preference to sell fishing days to resource users instead of trading them to other Parties (which could reduce overall efficiency in the fishery, as days may not be sold for the highest prices in the most productive fishing grounds). Arnason et al. (2015) suggests that this arrangement imposes non-trivial costs on trades between Parties, making the current volume of trading between Parties some distance from being free and unhampered.

Additional to the current arrangements for transferability of tuna fishing rights between states, this study considers the possibility that PICTs change the rules to allow resource users (i.e., harvesters) to transfer (i.e., trade) their authorizations to fish for tuna (i.e., tuna fishing rights) in a given EEZ (or potentially a larger area where these authorizations are issued through pooling) to another user. In the VDS, these fishing rights are specified

Box 4. Theoretical Economic Benefits from Trading Fishing Days between Resource Users

Trades in fishing days should occur only where both parties to the trade benefit, because the purchaser will only buy at a price that still allows them to profit, and the seller will only sell if the profits from doing so are greater than what they could have generated from using the vessel day and fishing. Hence, the profits are increased for both parties to the trade, and thus for the fishery as a whole. The more profitable the fishery as a whole, the higher the maximum attainable public revenues from license fees.

Source: Arnason et al. (2015)

as the authorization for a vessel to fish for a day, i.e., a "fishing day." A fishing day is defined as "any calendar day, or part of a calendar day, during which a purse seine vessel is in the EEZ of a Party outside of a port," unless the vessel applies to the Party for approval of that day as a "non-fishing day" because of bad weather, a full catch and sailing for port, deploying or retrieving fish aggregating devices, vessel breakdown, fishing net repairs, fishing net cleaning (trial) set, emergency, bunkering or licensed transit (PNA 2016). Fishing days are not currently transferable from one resource user to another (e.g., one company to another), though there are no restrictions on transfers from one fishing vessel to another owned by the same user (e.g., transfer between vessels within the same company) (Arnason et al. 2015). Alternatively, in the southern albacore fishery or more generally, transferability from one resource user to another could be applied to whatever unit is specified in the fishing right, e.g., the authorization for a vessel to fish during a period of time such as a year.

This change—PICTs allowing resource users to trade fishing days to other resource users—could be labelled changing the rules for tuna fishing rights from a regime based on individual effort (IE) units, to one based on individual transferable effort (ITE) units (Anderson et al. 2018, Squires et al. 2017, Townsend et al. 2008). More specifically, Squires et al. (2017) define an ITE regime as one where a TAE is set and then allocated to individuals, and explicit transferability of the effort rights is allowed between individuals, giving individual transferable effort. In Pacific tuna fisheries, this change would result in states (PICTs) allowing the portion of the TAE that they authorize (PAE) for use by individual resource users, to be transferred between these users (e.g., from one economic agent to another). As mentioned previously, this change may increase the efficiency of fishing companies and hence the potential benefits to them, and in turn the price they would be willing to pay for fishing days (Arnason et al. 2015). Like an ITQ regime, an ITE regime can also provide a voluntary mechanism for some resource users to leave the tuna fishery with compensation from those who remain, depending upon the duration of the rights (Anderson et al. 2018). Of course, there is no hard line between an ITE and ITQ regime, hybrids exist where for example harvesting is authorized in nominal units of effort, complemented by by-catch restrictions (Squires et al. 2017). In summary, the overall efficiency would be increased in the fisheries (in terms of increased profitability), and public revenues to PICTs (assuming Parties capture some portion of the increased profitability by charging higher prices for fishing days).

Of note, the space that tuna fishing rights apply to in the Pacific is defined by EEZs, such that ITE regimes could be created by individual PICTs for resource users in their respective waters—the governance change does not necessarily need to be uniformly adopted by Parties. This reflects differences in productivity by EEZ per the standard unit of effort, fishing days, creating different economic conditions across PNA members (and fishing mortality rates). However, where tuna fishing rights (e.g., fishing days) are defined by PICTs to apply to a collective space of more than one EEZ (i.e., "pooling"), adding the characteristic of transferability to create an ITE regime could theoretically only enhance flexibility and the number of vessels for which efficiencies could be gained. For those fishing days that are not pooled, PICTs could still in theory specify that the space to which the right applies includes other EEZs, such that the PAEs are maintained but users make the trades between zones rather than states. In this case, the gains would accrue to the resource users instead of PICTs who engage in trading—although adding this feature should

increase efficiency and hence the value of the days sold, such that PICTs can increase the price of the days, assuming the terms and conditions for each EEZ are uniform.

Summary of key concepts and definitions for consideration of making Pacific tuna fishing rights transferable. The possible governance change of adding transferability of tuna fishing rights, is defined as a change occurring at the national level in PICTs, within the VDS, in order to allow resource users to transfer their authorizations to fish (specified in authorized fishing days) to other resource users, while retaining the current duration of the right to fish and the space to which it applies (EEZ, or in cases of pooling, multiple EEZs). Such transfers would need to account for the difference in authorizations to fish (i.e., fishing days) by size class of the vessel in the purse seine VDS, aiming to ensure that aggregate effective fishing effort does not increase while nominal fishing days remain the same.

Box 5. Summary of Proposed Governance Change to Introduce Transferability of Pacific Tuna Fishing Rights

In summary, the potential rule change can be defined as creating ITE regimes at the national level, where tuna fishing rights have the following dimensions or characteristics for users:

Theory: rules change from authorizing IE to ITE

Space: EEZ (unless authorization to fish is pooled among multiple states)

Time: One-year duration to use the authorization, as per current regulations (though this could be modified)

Stringency: High, based on enforcement of compliance within EEZs

Transferable: Yes, from one resource user to another

Box 6. Definition of Key Terms

Tuna fishing right: authorization to access and withdraw tuna from a given space, during a prescribed time period

Individual effort (IE) regime: tuna fishing rights specified in nominal units of effort allowed to an individual resource user (e.g., vessel days), within a total allowed (total allowable effort or TAE), or as a share of the TAE

Individual transferable effort (ITE) regime: tuna fishing rights are specified in nominal units of effort allowed to an individual resource user, within a TAE, and individuals are allowed to transfer the rights to other individuals

Vessel day scheme: a management scheme agreed by the Parties to the Nauru Agreement that sets an overall total allowable effort limit on the number of days fishing vessels can be licensed to fish in the EEZs of Parties per year

Total allowable effort (TAE): the maximum number of fishing days by all licensed purse seine vessels in the EEZs of the Parties, in any management year (i.e., calendar year)

Party allowable effort (PAE): the total number of fishing days for a management year allocated to that Party pursuant to the Palau Arrangement

Fishing day: any calendar day, or part of a calendar day, during which a purse seine vessel is in the EEZ of a Party outside of a port," unless the vessel applies to the Party for approval of that day as a "non-fishing day" because of bad weather, a full catch and sailing for port, deploying or retrieving fish aggregating devices, vessel breakdown, fishing net repairs, fishing net cleaning (trial) set, emergency, bunkering or licensed transit

CHAPTER 3: SNAPSHOT OF THE PERSPECTIVES OF PACIFIC ISLAND THOUGHT LEADERS AND TUNA FISHERIES MANAGERS

Lars Olsen, Salome Taufa, and Transform Aqorau

Twenty-one thought leaders and senior fisheries managers from eleven countries and several regional organizations throughout the WCPO expressed a diversity of views concerning the current state of knowledge in the region on transferability of tuna fishing rights, perceived opportunities and key concerns, particularly the perceived potential economic benefits to Pacific Island countries and territories. In general, responses point to a consensus that while some managers and advisors in regional organizations understand the concept well from experiences in other cases, within Pacific Island governments the concept is often understood as referring to trades between states based on the example of the Vessel Day Scheme. Several respondents emphasized the potential benefits to states with smaller and less productive zones, to be able to transfer the rights that they issue to other states with more productive zones and higher demand. In terms of introducing transferability of rights between users, multiple respondents felt that this change would increase flexibility for companies and subsequently reduce costs, as well as increase access to finance by creating an asset in fishing rights. At the same time, there was some caution suggested in a number of responses, frequently around concerns that transferability may erode Pacific Island countries and territories' control over fishing within the zones under their jurisdiction. In summary, of those respondents that expressed an opinion about the potential costs and benefits of introducing transferability, 55 percent were supportive of pursuing the idea, subject to doing so cautiously and with safeguards for Pacific Island countries and territories. On the other hand, a number of respondents suggested that the current system was preferable, and/or expressed caution about this type of change.

Current Understanding of Transferable Tuna Fishing Rights in the WCPO

Experience or views of transferable fishing rights in various contexts. As may be expected, respondents indicated a wide spectrum of familiarity and experience with the concept of transferability in fishing rights, ranging from staff and advisors in regional organizations who have participated in the design of transferable quota systems elsewhere around the world, to those who consider transferability only between states based on the example of the VDS (over 38 percent of respondents), or those who have had no familiarity with it at all. For those familiar with the concept, some viewed transferability as trading of fishing rights however they are specified, while most considered it as applicable to quota-based systems rather than those based on effort, typically citing the examples in countries such as Iceland or New Zealand. A number of respondents had not considered transferability of tuna fishing rights between users or more broadly throughout the WCPO region, but rather referring to the existing examples of transferability between states, or changes to rules defining the space to which rights apply, i.e., "pooling" of zones for given access rights, or the duration to which the right applies, e.g., assigning access "in perpetuity." For several, the prospect raised "a lot of questions as to what would happen" given that the idea has not been tested in the region, and some hesitancy or

caution without learning more. In at least one case respondents mentioned that transferability was under consideration for a domestic fishery targeting export markets, together with management via catch quotas.

Assessment of the level of awareness among WCPO decision makers with the concept of transferability. Almost half of the respondents (47 percent) felt the concept was well known in some form among senior fisheries managers within the region, though the idea has typically been associated with quota-based systems. At least one respondent noted the idea has featured in discussions on options to strengthen the VDS for several years. Another 25 percent felt that the concept was largely understood by fisheries managers from PICTs who are Parties to the Nauru Agreement (PNA), and typically in terms of transferability between states (in this case between Parties). The remaining third of respondents felt that the concept was not widely and fully understood among fisheries managers and decision makers in the region. This view was more likely among respondents from PICTs that are not PNA members, where one respondent mentioned that it is still "a grey area with much to learn."

In general, responses point to a consensus that there are some WCPO fisheries managers and advisors who understand the concept well and have experience with transferability of fishing rights between users in other countries, but within PICT governments the concept is often understood as referring to trades between states based on the VDS example, or between users only in the context of quota systems, based on examples such as in New Zealand. Multiple respondents indicated that the level of understanding and experience with transferability differed within governments of PNA members and PICT governments that are not Parties.

Given that, as one respondent mentioned, the experience of PNA members with the VDS has been widely discussed in the region and among FFA members and meetings, it perhaps should not be surprising that the concept is in some cases equated to transfers or trades between states. In terms of transferability between states, one respondent pointed to the case of Palau as a good learning experience for managers in the region, where the Government has transferred fishing rights through the Federated States of Micronesia Agreement (FSMA), while closing their own exclusive economic zone to tuna fishing. More broadly, one respondent noted that property rights are developed for individuals in western countries but less so in PICTs, and as a result felt that there has been less of a push from stakeholders to have the government introduce transferability to users and risk reducing its control on access—hence markets in fishing rights have not developed as they did elsewhere.

One respondent highlighted that some level of transferability between users in the purse seine VDS already occurs, as (i) there are no provisions in the regional agreements for the VDS that prevent such transferability; (ii) many of the users are organized into associations or are large companies, who may have significant fleets such that they can transfer fishing rights (i.e., fishing days) between vessels within the association or company; and (iii) in some cases PNA members may effect a transfer by purchasing days from another PICT or from a company to whom it has already sold them, in order to re-sell to the company that needs additional days, at an increased price. The respondent suggested that while smaller, domestic companies may still have a need for the option to trade days, in practice any of the major needs and efficiency gains from

transferability may already be met within associations or large companies, or through what are effectively PICT government-mediated trades.

Ideas and recommendations to increase understanding of transferability of fishing rights, among PICT fisheries managers and key stakeholders. Multiple respondents expressed the need to shift understanding of the needs and potential benefits of introducing transferability among stakeholders in PICTs (e.g., "consultations to get the word out"), and suggested national and regional trainings, symposia and workshops, as well as a focus on success stories and case studies of where this has been applied.

Some respondents indicated an interest to learn from other countries outside of the region (PICT representatives "need to come out of their comfort zones and look at experiences from around the world"), while others noted that it could be useful to have workshops connecting representatives from Parties to the Nauru Agreement to representatives of non-PNA states, with the former providing exchanges for the latter. Multiple respondents suggested that it could be useful for PICTs to have a workshop to exchange ideas on transferability and possible benefits (though one respondent expressed a preference against more workshops in the region). One respondent emphasized that awareness-raising efforts should remind stakeholders that national approaches (for EEZs) are part of shared fisheries across the region.

Beyond fisheries managers in PICT governments, respondents noted the importance of involving industry stakeholders in discussions and consultations on any policy change, e.g., inviting industry representatives to workshops as well as government representatives. Additionally, several respondents emphasized that the public in PICTs needs to be educated to some degree and suggested the regional media as a good place to start to generate discussion.

Perceptions of Transferability in WCPO Purse Seine and Longline Fisheries

Respondents' feelings on the prospect of introducing transferability of access rights between users, within the purse seine or longline VDS. Forty percent of the respondents were generally supportive of introducing transferability of tuna fishing rights between users. One respondent noted the potential increased economic benefits for the fishery, mentioning that currently companies are hesitant to purchase too many tuna fishing access rights (e.g., fishing days), because if they do not use them then the costs are sunk. Transferability among users would encourage increased efficiency because rights holders who could utilize additional rights, can purchase them from holders who cannot use them as profitably. One respondent noted that in theory this increased flexibility should increase the value of the access rights to users, and hence the price at which PICTs can sell them. The aim as another respondent noted, would be to create a bankable asset for companies that they can use as collateral to access finance as needed.

Another noted that transferability could be introduced within the framework of existing tuna licensing arrangements, for companies fishing within a given EEZ.

Another 15 percent of respondents offered qualified support, e.g., if it is a government priority, and does not reduce states' ability to control fishing in their EEZs, or more specifically the use of the access rights they create. For example, one respondent suggested that on the one hand it

would increase economic benefits from tuna fishing and encourage investment, and on the other hand was concerned about the burden placed on governments to monitor trades, given relatively small agencies with capacity constraints. Can governments still monitor fishing efforts if the rights are traded—would they be notified of the trades, or be able to monitor the activities of those who purchase the rights? Can companies "game the [VDS]" by purchasing access rights specified for one type of vessel and trading them to other, more powerful vessels (given that access rights, or fishing days, are specified to the category of fishing vessel)? Or can PICTs tax the trades? Another concern raised was the potential adverse effects of concentration occurring if a relatively small number of companies purchase a majority of the fishing rights.

Another 15 percent did not support the introduction of transferability between users, citing concerns that PICTs would lose control over fishing activities and the resulting benefits, or that governments were not ready for the administrative and monitoring requirements. For example, one respondent suggested that there will be fewer benefits accruing to PICTs if users can trade tuna fishing rights (e.g., fishing days), while another highlighted greater administrative challenges than transfers between states. One respondent noted that from the perspective of industry, transferability would be preferred, but from the perspective of fishery managers, the questions of public trust are foremost: are the private companies capturing the benefits from use of the resource and not the public? Particularly if these are foreign companies where the benefits accrue outside of PICTs? An additional consideration mentioned was the potential of PICTs to limit access to the high seas zones, and the effects of transferability on administration and monitoring of that effort. Additionally, one respondent emphasized that the longline VDS was not at all ready for the introduction of transferability, suggesting that overall the fishery is not well managed currently, with limited monitoring and controls.

The remaining respondents did not express a preference in the absence of more information as to how the idea could be introduced in the Pacific context, as well as the expected economic costs and benefits. One respondent suggested that allowing users to extend the duration of the rights may be more beneficial than permitting trades, e.g., if unused fishing days can be "rolled over" to the following year.

Respondents' feelings on the prospect of introducing transferability of access rights between users, within longline fisheries that are outside of the VDS. Again, a diverse set of views emerged on the applicability or benefit to PICTs from allowing fishing rights to be transferable in the longline fisheries outside of the VDS. On the one hand, one respondent was optimistic about the benefits and viewed transferability as "the way to go to support the viability of tuna fishing in non-VDS countries," as long as foreign companies are not eligible to purchase rights in a trade. On the other hand, multiple respondents expressed concern that such trades could be monitored (e.g., in the absence of a vessel monitoring system for the fleets, an information system similar to iFIMS, etc.), and one respondent emphasized that the longline fisheries are in aggregate "poorly managed" so that transferability should be less of a priority for now. Another indicated that from their perspective introducing transferability would not be of interest in the longline fisheries outside of the VDS, as the rights are "not a commodity like [in] New Zealand." Finally, a respondent reiterated that fishing rights issued by flag states for their longline fleets to fish in the high seas zones are weaker, and should not be transferable.

More broadly, views were qualified depending upon the economic benefits that could accrue to PICTs. In addition to the concern about the administration and monitoring requirements, one respondent worried that as the benefits accrue to foreign companies via trades, the returns to PICTs may diminish. If users, i.e., fishing companies, benefit, will these benefits be captured by PICTs?

Additionally, several suggestions were given. One respondent suggested that it may be easier to begin by expanding state-to-state transfers (as well as the space for which rights are defined), for example by focusing on additional PICTs joining the longline VDS. Another respondent mentioned the potential for state-to-state transfers in longline fishing rights to help respond to shifts in the distribution of stocks with climate change. Finally, a respondent suggested that a single management system is needed for the southern albacore longline fishery, as a precursor to transferability of access and withdrawal rights.

Another respondent emphasized that a market in rights could only be created if the rights issued are limited or fixed.

Perceived Economic Costs and Benefits to PICTs from Introducing Transferability of Tuna Fishing Rights

Perceived size and distribution of economic benefits to PICTs from transferability. Responses on the potential benefits focused both on transferability of rights between users, and/or between states. In terms of introducing transferability of rights between users, multiple respondents felt that this change would increase flexibility for companies and subsequently reduced costs, as well as increase access to finance by creating an asset in fishing rights. Several respondents suggested that companies would be willing to pay PICT governments higher fees for the rights as a result, and hence PICTs would generate increased economic benefits (in the form of public revenues) from the fisheries as resource owners. One respondent termed this a win-win for PICT governments and companies. Another respondent noted that if PICT governments moved together to introduce transferability between users with clear rules, this could create a global commodity in tuna fishing rights that could potentially reduce risks for PICTs. One respondent suggested that this could potentially help maximize the resource rent generated in the fisheries, though questioned whether or not PICTs could capture the additional rent (or if it would leave the region via foreign companies).

Some respondents added caveats to these perceived benefits, for example that PICTs would lose control over the resources via the introduction of transferability between users and potentially new players entering the fisheries. Another raised the question of whether or not a market for trades would emerge, for example in the purse seine fishery where the number of companies and their fixed capital stock is somewhat static. One respondent raised the question of the potential impact on companies with domestically flagged vessels operating in the fisheries. Lastly, one respondent noted that efficiency would be expected to increase and subsequently the fees that PICTs can charge for the fishing rights, if there is a robust fisheries management regime in place.

Multiple respondents emphasized the potential benefits to PICTs from increasing transferability between states (with some perceiving more benefits to this policy change than to introducing

transferability between users), typically in terms of benefits to non-PNA members from joining the VDS. These responses emphasized the potential benefits to PICTs with smaller and less productive EEZs, to be able to transfer the rights they would issue to other PICTs with more productive EEZs—potentially with the added benefits of increasing the efficiency of their fisheries management systems (e.g., from joining the VDS and utilizing the FIMS to monitor fishing days). At least one respondent suggested that some PICTs could benefit from transferring the rights they issue to the high seas. Conversely, at least one respondent expressed the concern that PICTs with more productive EEZs would incur a cost from increased state-to-state transfers, and that this would essentially be a transfer of economic benefits from those PICTs to others with less productive EEZs.

Finally, one respondent considered at length the potential benefits for introducing transferability among users within the purse seine VDS. Those comments are presented here in more detail (though still summarized) given their relevance. The respondent noted that much of the empirical evidence around the world for efficiency gains as a result of transferability has occurred in fisheries where a fixed number of individual rights are issued as a share of the total allowable catch (i.e., quotas or catch shares), as opposed to those such as the VDS where rights are issued as a share of the total allowable effort. For example, many experiences have provided evidence for efficiency gains in quota management systems where transferability has allowed: (i) users to have increased short-term flexibility (e.g., where one has a good catch and needs more quota, while another has shares it cannot use); and/or (ii) users in a multispecies fishery whose quota may be reached for one species, preventing the user to harvest the remaining quota for another associated species (depending upon fluctuations in catch composition); and/or (iii) overcapitalized fisheries (often the case where quota systems are introduced) to reduce capacity, i.e., where more profitable users purchase quotas from less efficient ones while overall catch is frozen or reduced; and/or (iv) longer-term quotas held by older users can be purchased by newer, more efficient users. However, the respondent noted that some of these efficiency gains from transferability may not be present where the rights are defined as a share of total allowable effort (e.g., the efficiency gains from transferability of quota in a multispecies fishery, since the right to effort already applies to multiple species). Additionally, in the case of the purse seine VDS the respondent noted that there is not currently any clear level of overcapitalization that would be reduced (and the VDS already reduces capacity directly through the fee on days, which increases the costs for less profitable operations who may exit the fishery), nor is there an efficiency gain from newer, more efficient operators replacing older, less efficient operators, since the rights have a relatively short duration (one year).

The respondent concluded by suggesting that while in theory there are efficiency gains from introducing transferability between users, in practice they might be relatively limited in the purse seine VDS. Where the economic benefits from transferability may arise are the relatively limited need for flexibility by operators in the number of days they need to purchase each year (currently the duration of the right). Essentially, one operator buys more days than they need, another needs more days than they have, there is a small efficiency gain from the trade. Additionally, many of the users are currently collectives, which can transfer the days between fleets of as many as 20–30

vessels. In sum, the respondent suggested that efficiency gains from introducing transferability into the purse seine tuna fishery are probably relatively small.

Perceived size and distribution of costs to PICTs from transferability. Multiple respondents suggested that PICT governments would incur increased administrative and monitoring costs of transferability between users (e.g., for registration of trades and monitoring compliance with the overall system), in order to ensure that "the process is bullet proof." There were differing views on the potential size and distribution of these costs, with some respondents expecting them to be relatively large (particularly the initial costs), while others noted these could be reduced by existing systems such as the VDS (with one respondent proposing a Pacific-wide FIMS) or shared rules across PICTs for the introduction of transferability. One respondent emphasized that administration and monitoring of trades would be a big cost to PICTs with smaller administrations. Another mentioned that the biggest cost to PICTs would be if the introduction of transferability among users led to an increase in total fishing effort for a given fishery, and hence reduced sustainability.

Regardless of the size of the costs, multiple respondents suggested that PICTs should recover them, including the initial costs to introduce the change. One respondent suggested that if management costs increased, "PICTs would balk at going in this direction," while another questioned whether industry could bear additional costs. Another mentioned that PICT governments may incur initial costs to assuage public concerns about loss of control over the resources. Finally, several respondents referred to the potential costs of increasing state-to-state transferability of fishing rights, e.g., if PICTs join the VDS, both in terms of increased administration costs for the VDS and in terms of potential reductions in the allocation of effort quotas (PAEs) to participants whose EEZ catch histories may be reduced as a result of their allocation being used elsewhere.

Perceived Challenges and Concerns for Introducing and Administering Transferability of Tuna Fishing Rights

Key challenges associated with transferable tuna fishing rights in the WCPO. A number of challenges to implementing transferability among users were highlighted by respondents, but most prominent was the administrative capacity in PICTs for the introduction and management of transferability among users. One respondent noted that the FIMS could help with this challenge, as a foundation for monitoring trades. Relatedly, several respondents emphasized the challenges for PICT governments to be able to enforce compliance with fishing rules if rights are transferable among users. One respondent noted that a standardized and transparent set of rules will be needed across each fishery, with a system to verify trades that can enhance trust in the secondary market. Several respondents also highlighted the challenge of translating the idea into national legislation and regulatory frameworks across PICTs. Additionally, some respondents pointed to the challenge of ensuring that all users and managers understand the new rules and system.

Actions recommended for PICTs and regional organizations who wish to introduce transferable fishing rights in the WCPO. Multiple respondents suggested that if PICTs wish to introduce

transferability of tuna fishing rights among users in their EEZs, then a shared regional understanding and consensus on the idea would be needed, followed by individual countries and territories making the change. Several respondents reiterated that the introduction would be made at the national level in PICTs, with a priority to introduce legislation and guidelines that create very clear rules for who may trade and how trades may occur. One respondent emphasized that all participants would need to understand the new rules. Another suggested an incremental approach that builds upon experiences and successes, starting within the purse seine VDS and building experiences that could eventually be transferred to the longline fisheries. A respondent cited the example of how "pooling" began within the purse seine VDS, starting small and expanding with successes.

Concerns expressed about transferability of tuna fishing rights. As may be expected with any significant proposed policy change, respondents expressed a number of concerns that they felt would need to be addressed if the dialogue on transferability advances, including among others (in no order or ranking):

- *Impact on sustainability*: will the introduction of transferability affect fishing effort? One respondent stated that PICTs "must keep the cap" on fishing effort, so this change should not lead to an increase.
- *Caution to introduce a change in fisheries management*: One respondent indicated no concerns now, as opposed to several years ago, because they understand rights-based management of fisheries better now. However, several respondents noted that this is new, and expressed a general level of uncertainty and caution (e.g., would companies "misuse" transferable fishing rights?). One respondent added that the public is not familiar with transferability, which can lead to questions if governments want to introduce a change. Another respondent noted that there were many questions when VDS was proposed and introduced, but now it is widely accepted.
- *Impact on PICT government control over tuna fishing rights*: Several respondents expressed a concern about any potential loss of government control, and one noted that PICT governments would need to weigh any trade-offs between greater control and increased efficiency. Would this give companies more leverage in negotiations with PICTs? Would this equate to privatization of the resource, which PICTs do not want?
- *Capacity of PICT governments to administer and monitor transfers*: multiple respondents expressed concerns about government capacity to administer and monitor such a system, including the legal frameworks within each EEZ, the data systems, the ability to track which companies and vessels have days, etc. A key question raised was how will transferability be administered in a given context?
- *Size of the market for trades*: some PICTs have relatively small tuna fleets operating in their EEZs, hence the introduction of transferability between these users could have high transaction costs for relatively low returns. Relatedly, one respondent questioned if some buyers of access rights would aim to conserve rather than use them, e.g., conservation NGOs, and/or could resell them at below-market prices if not operating with a commercial imperative.

- *Economic benefits to PICTs*: as with any policy change, respondents suggested the need to see various scenarios for introducing transferability into given tuna fisheries and EEZs (e.g., 3 to 5 options), and the projected size and distribution of the costs and benefits of each (notably the management costs)—essentially the evidence for potential economic benefits from transferability.
- *Legal basis for transferability in PICTs*: multiple respondents questioned the existing legal basis for transferability in PICTs and expressed concern over the costs of changing legislation and regulations.
- *Impact on food security in PICTs*: one respondent asked what the impact might be on PICT food security.

Further considerations on the potential of transferability in tuna fishing rights. In conclusion, of those respondents that expressed an opinion about the potential costs and benefits of introducing transferability, 55 percent were supportive of pursuing the idea, subject to doing so cautiously and with safeguards for PICTs. For example, one respondent felt that at least some PICT governments would be interested in the concept in terms of its potential to increase efficiency (e.g., PNA members are looking for ways to strengthen the VDS to enhance economic benefits) and allow companies and boat owners to have greater flexibility in their operations. Another suggested that in general, strengthening the property rights characteristics of the tuna fishing rights issued by PICTs would be a benefit to the region. Another felt that the idea has a lot of potential, but "people need to go into it with their eyes wide open as there are risks involved. This is why it needs to be done in a slow, methodical way to not jeopardize [PICTs'] revenue streams." On the other hand, a number of respondents suggested that the current system was preferable, and/or expressed caution about this type of change.

Of note, a different but related idea that emerged from some of the interviews for consideration revolved around changes to the duration of fishing rights issued by PICTs. One respondent emphasized that the industry would prefer a longer duration for access rights more than transferability, while another suggested that the short duration is a constraint on private sector and investment. One respondent suggested a period of ten years. On the other end of the spectrum, one respondent cautioned against extending the duration into perpetuity (as a long-term right), stating that the idea runs counter to the conception of property in the region, e.g., land is not sold in perpetuity. Another respondent mentioned that extending the duration for long periods of time, effectively in perpetuity, is not a feasible option for PICTs at this time.

Finally, in terms of a possible pathway for PICTs to consider if there is an interest to pursue transferability, one respondent offered a number of specific, small and incremental steps that could be envisaged, starting with the purse seine VDS:

(1) Begin to extend the duration of the access rights issued by the PICTs participating in the VDS, e.g., for three, five, and potentially even ten-year durations (where the rights will share some characteristics with treasury bond systems), which will create a demand for transferability and secondary markets;

(2) Continuing expanding the space for which the rights are defined via "pooling" arrangements, again as these rights would create more demand for transferability; and

(3) Transferability could be introduced and a controlled secondary market (e.g., where companies can go back to the PICT who issued the right to organize a trade to another company, for a fee).

Beyond Transferability, Perceptions of the Biggest Opportunities to Increase Economic Benefits to PICTs from the Tuna Fisheries

The varied responses suggested broad types of opportunities for PICTs to increase economic benefits from WCPO tuna fisheries, which have largely been under discussion among policy makers in recent years. These included, in no order of emphasis, (i) enhanced cooperation among PICTs at both the regional and subregional level; (ii) increased value added to tuna harvests within PICTs, including at the retail segment of the value chain in partnership with brands; (iii) enclosure of the high seas zones; and (iv) strengthened management of the purse seine fishery to increase efficiency. Several respondents doubted that significant economic opportunities exist in the longline fisheries, citing "weak management" leading to low rents, due to uncontrolled longline fishing on the high seas (with control dependent upon agreement with a number of large distant-water fishing nations whose fleets operate there).

In terms of enhanced cooperation, several respondents mentioned the potential opportunities for PICTs with fewer catches of tuna in their respective EEZs, to cooperate in generating more value from their resources. One respondent suggested that this might take the form of increased subregional cooperation around the management of specific tuna stocks, e.g., skipjack by the Melanesian and Micronesian PICTs together with the Cook Islands, yellowfin and bigeye by the Melanesian and Micronesian PICTs, and the south Pacific albacore stock by the Melanesian PICTs together with members of the Te Vaka Moana group of countries. Alternatively, some respondents expressed concern about a trend toward "subregionalization."

Multiple respondents pointed to opportunities for PICTs to partner with industry to increase the portions of the tuna value chains captured in the region, particularly for PICTs with smaller tuna harvests in their EEZs, for example citing a regional "hub and spoke concept" for increased tuna processing and cold storage in the region. Others mentioned opportunities from moving to higher value tuna products in the marketplace, including through eco-certification for example. One respondent suggested that PICT governments charter fleets to control the supply, and another referenced a "blue continent concept" for PICTs to collectively negotiate fish supply with the markets. At the same time, some respondents expressed skepticism that more onshore tuna processing would be viable in the region, unless private investment comes at the expense of revenues from fishing rights, given the competition from relatively low-cost operators in Thailand and the Philippines. Another respondent indicated that PICTs could generate some benefits by forming relationships with product brand owners but was not confident that any "new mythical products are going to be created."

Several respondents emphasized PICTs would realize additional economic gains as a result of continued strengthening of management of the purse seine fishery and suggested a focus on

increasing efficiency. One respondent noted that the purse seine fishery is well managed and PICT policy could help generate and capture further efficiency (and resource rent) gains, though not on the order of the exponential growth rate seen over the last ten years since the introduction of the VDS.

Lastly, several respondents suggested regional cooperation by PICTs to "address the [tuna] fishing effort on the high seas by having high seas closure." While other respondents proposed that enhanced state-to-state transferability of fishing rights could allow PICTs with smaller EEZs to transfer rights to the high seas and generate higher fees for those rights.

CHAPTER 4: CASE STUDIES IN THE POTENTIAL ECONOMIC BENEFITS TO PACIFIC ISLAND COUNTRIES AND TERRITORIES FROM THE INTRODUCTION OF TRANSFERABILITY

Mark Soboil, Alice Thomas-Smyth, and Sarah McTee

Case studies were conducted in the purse seine and tropical longline fisheries. For the former, a stylized economic model was created to suggest the scale of potential benefits in a hypothetical PICT where purse seine fishing is highly productive, as compared to a hypothetical PICT where the purse seine fishing is much less productive. In the more productive example, introducing transferability among authorized users has the potential to increase benefits to the country by only a modest amount via taxes on the secondary market or fees on the trades—estimated to be on the order of 1 to 2 percent in some scenarios. For the latter, (the tropical longline fishery), the case study is qualitative, and upon review, the basic conditions for transferability of fishing rights are not considered to be in place.

As described in the introduction section, the study did not attempt to predict with any level of certainty the effect of introducing transferability of Pacific Island tuna fishing rights between users, which would require fishing firm-level data not currently available. However, the study aims to help policy makers consider the scale of potential economic benefits to PICTs from this change, based on scenarios developed with expert judgment of the authors and publicly available data on the tuna fisheries in the region. For this purpose, the introduction of transferability of fishing rights between users is considered in the case of the purse seine fishery, and the tropical longline fishery. In the case of the purse seine fishery, a number of scenarios are explored for hypothetical PICTs with higher and lower fishery productivity. In the longline case, a more qualitative consideration suggests that necessary preconditions for transferability may not yet exist.

Case Study on the Purse Seine Tuna Fishery

Key assumptions bounding the scenarios. Firstly, the context for economic analysis of the market in purse seine tuna fishing rights (i.e., authorized fishing days) and the potential benefits of creating a secondary market among foreign-registered buyers of days is considered where the total number of fishing days available for purchase in the purse seine fishery (the TAE) is fixed. The total available for each PICT who is a Party to the Nauru Agreement plus Tokelau is also fixed, so that the supply curve of days is perfectly inelastic (i.e., if demand is held constant then a decline in supply will increase the market price). As mentioned previously, the PNA sets a benchmark price allowing each member to set their own price for fishing days to different segments of the market. Currently, the sale of fishing days by PNA members occurs in two market segments, the domestically registered fleet and the foreign-registered fleet, both with demand curves affected by the complementary nature for the price of fuel and the price of skipjack in the Bangkok market. The PNA members can discriminate in sales by prioritizing one of these market segments over the other, as well as prioritizing buyers within each segment based on their willingness to pay. PNA members currently sell some days at reduced prices through

the Federated States of Micronesia Agreement (FSMA), which provides access at lower costs for vessels that meet requirements for domestic registration and value addition.

Secondly, this case study is bounded by the existing policy objectives stated in the Roadmap as follows: (i) sustainability of the resource; (ii) increased value to the region from the tuna fisheries, including a greater proportion of the catch by domestically-registered vessels and higher economic returns to member countries, through both public revenues from access fees and contributions of the harvest subsector to GDP; (iii) more employment for nationals of Forum members; and (iv) food security through increased supply of catch for domestic consumption (FFA and SPC 2015, FFA 2018). Within these boundaries, scenarios were developed in consideration of the objective for an increased proportion of the catch by domestically registered vessels. The domestically registered purse seine vessels are considered here to be only marginally profitable, typically older and less efficient than foreign-registered purse seine vessels and owned by companies that are not often vertically integrated. Conversely, many of the foreign-registered purse seine vessels are considered to be vertically integrated (acknowledging fleet-level differences in production technology by flag state), allowing the operations to better adjust to market conditions (e.g., to stockpile tuna catch in cold storage facilities and continue to profit when raw material costs are low through their canning and katsuobushi business). At the same time, given the policy objective to increase catch from domestically registered vessels to contribute to value added in PICT economies (e.g., from local fish landing and processing, provisioning of vessels, etc.), these vessels are offered fishing days at lower prices than the minimum price agreed by PNA members for foreign-registered vessels.

Domestically registered vessels purchasing fishing days at a reduced rate, generally operating at marginally profitable levels, are assumed here to exhibit a trend of selling fishing days to more profitable foreign companies if the opportunity to do so is created. Essentially, with the introduction of transferability of fishing days between users in the purse seine fishery, this study assumes that domestically registered vessels would generally tend to sell their days to foreign-owned and flagged operators, consolidating and reducing their aggregate effort and contribution to measures of domestic value-added (e.g., as a result of reduced catch and local processing, reduced employment on vessels, etc.), while enhancing the overall efficiency of the fishery. This is assumed to have an effect on the objectives for increased domestic value-added for PICTs from the tuna fisheries, as foreign companies would not have an incentive to invest in local processing given the relatively higher costs to options outside the region (e.g., lease arrangements for access to local real estate for processing operations can be difficult, labor costs are typically higher and more uncertain, electricity costs may be higher, etc.). The net benefits of such a trade-off are not weighed here, whereby PICT governments reduce the access fees they receive from domestically-registered vessels in exchange for the contribution of their operations to value-added (e.g., comparing the potential revenues lost from reduced access fees to domestically registered vessels, to the employment, port charges, taxes and other local expenditures that they generate). Additionally, the case study assumes that with the introduction of transferability in fishing days for foreign-registered purse seine vessels, there would be a time lag of potentially several years before operations would shift significantly and companies would be in a position to purchase a significant number of days from other users, essentially before a secondary market fully develops.

The motivation for selling days instead of fishing them, centers on the assumption that for some companies/countries, selling a day to a competitor would be more profitable than taking on the cost of fishing those days directly.

On the basis of these assumptions, this case study focuses on the introduction of transferability among users who own and operate foreign-registered vessels, excluding trades in days between domestic and foreign vessels (i.e., the days available and purchased by domestically registered vessels would not be eligible for transfers). A scenario could also be envisaged where PICTs permit domestically registered fleets to transfer days and participate in a secondary market with foreign flagged vessels on a limited basis, e.g., as a fixed limit or a percentage of the days purchased. However, this scenario cannot be considered without more information on current pricing for fishing days purchased by domestically registered fleets, and an appropriate targeted cap or percentage of the days that would be prohibited from trades. Of course, PICTs could also create a separate provision of transferability only among domestically registered vessels, essentially two secondary markets—one for foreign-registered vessels and one for domestically registered vessels—but again further information on current pricing of domestically registered vessels would be needed for the analysis. Finally, data to inform scenario development was available at the aggregate level of zones rather than at the operational level, as would be needed to support a more thorough analysis of willingness to pay (e.g., using a Monte Carlo risk analysis, or as an interim step a sensitivity analysis of different probability values for buying and selling fishing days).

Scenarios for a PICT with high productivity and purse seine catches in its exclusive economic zone. This group of scenarios considers a hypothetical PNA member with relatively high productivity for the purse seine fishery in its EEZ, in terms of both fishing catch and effort (based on total annual catch in the EEZ and fleet characteristics). These scenarios could be considered indicative of several PICTs that are Parties to the Nauru Agreement, for example the Federated States of Micronesia, Kiribati or Papua New Guinea, taking into consideration that the spatial allocation of fishery productivity shifts over time as a wide range of environmental variables fluctuate (while acknowledging that other variables affect fleet behavior and aggregation as well, e.g., proximity to port or transshipment facilities).

Scenario one: modest trading in the initial year(s). In the first scenario, a basic model of fleet behavior if transferability of fishing days is introduced for foreign-registered fleets assumes that the fleets registered in Taiwan and in the United States (US) are operating at a loss at the vessel-level, and would sell 10 percent of their fishing days in a given year to increase their profits. Essentially, these fleets could earn more by selling their days than fishing them, if revenues are low or decrease and day prices offer a more profitable alternative to fishing. For example, such losses can occur as the stocks shift and catches fluctuate, causing vessels to experience lower catch rates, yet preferring to operate at a loss rather than remaining at port and paying dock fees or losing crews. These foreign-registered fleets also have the option to shift their fishing activity to the Eastern Pacific, providing an alternative source of income. The fleet registered in Korea is highly profitable and efficient, and as a result would seek to purchase an additional 15 percent of the total days purchased from the PICT on average, while the fleet registered in Japan is assumed to seek an additional 5 percent of their initial amount of fishing days. This results in the total

number of 407 fishing days offered by vessels registered in the US or Taiwan for sale on the secondary market, and a total of 447 days sought for purchase by vessels registered in Korea or Japan.

According to the basic model, vessels registered in Korea will purchase 77 percent of the days available on the secondary market, and vessels registered in Japan will purchase the remaining 23 percent. The total value of the secondary market in fishing days in this hypothetical PICT is US$6,544,585 in a given year, or roughly equivalent to 7 percent of the total public revenues generated in the PICT by selling its annual allocation of fishing days (assuming an average price of US$10,000 per day, and that each participating fleet pays their maximum willingness to pay per vessel day). One way the model estimates the economic benefits to the country is by calculating the revenues from a 10 percent tax on the transactions in the secondary market. This would generate an additional US$641,211 in public revenues to that country. If the PICT set a transaction fee on the secondary market of US$500 per vessel day sold, the additional public revenues would be US$203,500. However, the country could also capture revenue by offering both transferable and nontransferable fishing days at different costs. In this scenario, foreign-registered fleets receive an average of US$5,755 profit per vessel day (above the original purchase price of the vessel day) from selling transferable days at a higher price. This estimate is excluding any additional taxes and fees charged by the country for the subsequent transfer of fishing days. This implies fishing fleets would be willing to pay an increased price for transferable fishing days due to their increased value. If the country sold transferable fishing days at US$13,000, in this scenario the country would receive at least an additional US$1,221,000 from the increase in the price assuming fleets purchased only exactly the number of transferable fishing days they needed to sell.

In summary, in this scenario, the PICT would generate additional revenues on the order of just over 1 percent of current revenues from the sale of fishing days—an economic benefit, albeit a modest one. This of course does not factor in the initial costs of developing the rules of the secondary market and the transfers permitted, nor the recurrent costs of a system to monitor these trades and ensure continued compliance with the rules governing fishing in the EEZ.

Scenario two: inclement weather and negligible PICT benefits. In this scenario, a halt in fishing activity of smaller vessels (<50 meter in length) is simulated under the assumption that inclement weather will prevent vessels of this size from utilizing all of the fishing days that originally purchased. As a result, the fleet registered in Korea will sell an unusual volume of fishing days on the secondary market, while the fleet registered to the US is able to purchase additional days given their relatively large vessels (>80 meters). Under this scenario, the total value of the secondary market in fishing days in this hypothetical PICT is US$5,162,914 in a given year, however, an excess of 43 days was unable to be sold (given the relatively small size of the market). This is roughly equivalent to 1 percent of the total public revenues gained in the PICT by selling its annual allocation of vessel days (assuming an average price of US$10,000 per day, and that each participating fleet pays their maximum willingness to pay per vessel day, in order to estimate the maximum possible revenue generated by this scenario). The economic benefits in the form of additional public revenues estimated for the PICT at a rate of 10 percent of the value of the secondary market is US$516,291, or for example at a fee rate of US$500 per vessel

day transacted, US$193,500. The average profit for fleets from selling their vessel days on the secondary market is US$3,346 per vessel day sold, indicating an increased value that the country could capture via increased prices for transferable days. In this scenario, if the country sold only exactly the number of days sold in the secondary market at an increased price of US$13,000, the country would receive excess revenue from the transferable fishing days of US$1,161,000.

In summary, in this scenario the PICT would generate additional revenues on the order of roughly 1 percent of current revenues from the sale of fishing days—a modest economic benefit, before costs of the transition to and operation of the secondary market are considered.

Scenario three: slightly higher PICT benefits in a more mature secondary market. In this scenario, several years of a successful secondary market for fishing days in the PICT are already assumed to have occurred. The fleet registered to Korea has added another vessel to account for the opportunity from potential excess fishing days offered on the secondary market. This assumes that the supply of fishing days remains fixed and while Korea may be able to increase the number of days they purchase in the primary market, they are not able to source all of them directly from the PICT. Vessels in this fleet have the highest willingness to pay for fishing days on the secondary market, making them the sole buyers, and inducing other fleets to sell at higher prices to match the demand. Under this scenario, the total value of the secondary market in fishing days in this hypothetical PICT is US$9,770,462 in a given year, roughly equivalent to 10 percent of the total public revenues generated in the PICT by selling its annual allocation of fishing days (assuming an average price of US$10,000 per day, and that each participating fleet pays their maximum willingness to pay per vessel day). The economic benefits in the form of additional public revenues estimated for the PICT at a rate of 10 percent of the value of the secondary market is US$977,046, or for example at a fee rate of US$500 per vessel day transacted, US$304,500. The average profit for fleets from selling their fishing days on the secondary market is US$6,034 per vessel day sold, indicating an increased value that the country could capture via increased prices for transferable days. In this scenario, if the country sold only exactly the number of days sold in the secondary market at an increased price of US$13,000, the country would receive excess revenue from the transferable fishing days of US$1,827,000. Note that given the importance of skipjack prices in Bangkok to drive fishing effort, the basic model used here could be run with different skipjack prices to assess results as prices change.

In summary, in this scenario the PICT would still generate additional revenues on the order of just under 2 percent of current revenues from the sale of fishing days—a slightly higher but still modest economic benefit, compared to the first scenario.

Scenarios for a PICT with lower productivity and purse seine catches in its exclusive economic zone. This group of scenarios considers a PNA member with relatively low purse seine fishing productivity in the waters under its jurisdiction in terms of fishing catch and effort, for example the Republic of the Marshall Islands or Tuvalu.

Scenario one: small market and negligible benefits. In this scenario, lower than expected catches are assumed to result in fleets registered in Taiwan selling 5 percent of their days on the secondary market, while the fleet registered in the US is selling 1 percent (as previously

mentioned, these vessels may prefer low catch rates leading to vessel-level losses, rather than remaining at port and paying dock fees, or some vessels may fish in the Eastern Pacific). The fleets registered in Korea are able to purchase up to 15 percent of the amount of days they initially purchased, due to their higher levels of efficiency. Only 15 fishing days are offered on the secondary market due to the relatively small size of the PICT's fishery and hence the market, though the fleets registered to Korea would be able to purchase much more.

Under this scenario, the total value of the secondary market in fishing days in this hypothetical PICT is US$320,848 in a given year, roughly equivalent to 1.5 percent of the total public revenues generated in the PICT by selling its annual allocation of fishing days (assuming an average price of US$10,000 per day,19 and that each participating fleet pays their maximum willingness to pay per vessel day). The economic benefits in the form of additional public revenues estimated for the PICT at a rate of 10 percent of the value of the secondary market is US$32,084, or for example at a fee rate of US$500 per vessel day transacted, US$7,500. The average profit for fleets from selling their fishing days on the secondary market is a surprisingly high US$10,392 per vessel day sold. This suggests PICTs could increase the total value of fishing days by selling transferable days at increased prices. In this scenario, if the country sold only exactly the number of days sold in the secondary market (15) at an increased price of US$13,000, the country would receive excess revenue from the transferable fishing days of US$45,000.

In summary, in this scenario the PICT would still generate additional revenues on the order of 0.1 percent of current revenues from the sale of fishing days—negligible benefits before costs are considered.

Scenario two: inclement weather and lower trading. In this scenario, inclement weather is envisaged and assumed to result in the fleet registered in the U.S. being the only one able to purchase days on the secondary market, at a relatively small amount (3 percent of the initial amount purchased). At the same time, the fleets registered in Korea and Taiwan are each expected to sell at roughly 5 percent of the initial amount purchased, due to the weather. Under this scenario, twice as many fishing days enter the secondary market as are purchased, resulting in a total value of the secondary market in fishing days in this hypothetical PICT of US$137,368 in that year, less than 1 percent of the total public revenues generated in the PICT by selling its annual allocation of fishing days (assuming an average price of US$10,000 per day, and that each participating fleet pays their maximum willingness to pay per vessel day). The economic benefits in the form of additional public revenues estimated for the PICT at a rate of 10 percent of the value of the secondary market is US$13,737, or for example at a fee rate of US$500 per vessel day transacted, US$8,171. The average profit for fleets from selling their fishing days on the secondary market is US$3,354 per vessel day sold, indicating an increased value that the country could capture via increased prices for transferable days. In this scenario, if the country sold only exactly the number of days sold in the secondary market at an increased price of US$13,000, the country would receive excess revenue from the transferable fishing days of just US$48,000.

In summary, in this scenario the PICT would still generate negligible additional revenues in comparison to the current revenues from the sale of fishing days—given the small market.

Considerations emerging from these scenarios in two hypothetical PICTs. The model runs for these scenarios reflect in both cases that foreign fleets commonly operate at a vessel-level daily loss, based on the cost assumptions used and the available data on effort and revenues (catch and price). Some of these losses are relatively small and reflect cost assumptions, confirmed by observations of the authors that foreign fleets commonly incur vessel-level economic losses as part of vertically integrated companies (as well as experience "boom and busts" in profits). This exercise has focused on harvesting subsector only, and not the potential efficiency gains up the value chain that could further increase companies' willingness-to-pay for fishing days on the secondary market (including lower costs from secured supply, whereby the ex-vessel price becomes de facto a transfer price). The model could further be expanded to make it dynamic and run over several years in order to allow for competition to sell/purchase fishing days in the secondary market to impact initial PICT sale prices and total revenues received.

Of note, the smaller hypothetical PICT with lower overall purse seine fishery productivity does show higher catch-per-unit-effort by fleet than in the larger, more productive EEZ. This could be explained by reduced competition, more spatially explicit stock locations, or the methods used that assigned catch from regional blocks to specific EEZs. The result in the model is that the number of vessels operating in the hypothetical PICT with lower fishery productivity is low.

However, the aim of this thought exercise has been to consider the initial order of magnitude of economic benefits that could potentially be generated for PICTs through the introduction of this change in their legal frameworks and management systems. The exercise suggests that relatively small market size for a number of PICTs among the PNA, as well as assumptions that many foreign fleets are vertically integrated and running vessel-level economic losses, i.e., resource rents are already near their current frontier, and demand for days is largely met (as well as the relatively short duration of the rights allowing for new entrants in the short-term). The exercise suggests that there are potential short-term economic benefits to the change (before costs are considered), but these are modest at best depending upon the level of fishery productivity within the EEZ.

Case Study on the Tropical Longline Tuna Fishery

In the case of the tropical longline fishery, also managed (at least partially) under the VDS, scenarios were not modelled because the basic preconditions for transferability suggested by theory and empirical evidence (in Allen et al. 2010) in Chapter 1 have not been met. These include:

(1) Setting a cap on fishing: where the group of states involved in the management of the transboundary fishery develops a limited entry scheme, with an overall limit to achieve a shared goal and defined in either fishing inputs or outputs;

(2) Allocating the fishing rights among the group of states, within the cap (i.e., the total limit): whereby the effort or catch limit is divided and distributed among users;

(3) Member states allocate fishing rights (for access and withdrawal) to authorized users; and

(4) States allow for transferability, between states and/or between authorized users (Allen et al. 2010).

With these conditions in mind for transferability, the cap on allowable effort (total allowable effort) in the tropical longline fishery applies to less than half of the total effort, and has steadily increased from 2014 (e.g., from 130,000 days to over 165,000 days in 2016). Without the first condition met, there is not currently a scarcity on access and withdrawal rights in the fishery that would support a secondary market with transferability (indeed many PICTs have a surplus of fishing days, as high at 75 percent of their allocations in the VDS). In this context, PICTs already sell the access and withdrawal rights at a small price, or in some cases without a price, such that there is not sufficient demand for transferability. As such, there would appear to be limited opportunity for PICTs to increase the economic benefits they receive from the tropical longline fishery in the short term, until access and withdrawal rights are limited. Without reductions in the total number of longline fishing days available, the model would not show any effects from introducing transferability among authorized users. Finally, this study did not attempt to undertake development of a model for this fishery. The larger number of vessels involved in the fishery combined with a greater number of companies and cost structures, as well as products and markets, makes predicting behavior much more challenging than in the purse seine fishery.

CHAPTER 5: LEGAL ISSUES AND OPTIONS FOR TRANSFERABILITY OF PACIFIC ISLAND TUNA FISHING RIGHTS: CURRENT PRACTICE AND MODELS FOR THE REGION

Stuart Kaye, Anthony Morrison, and Kamal Azmi

Legal instruments available to introduce transferability into Pacific Island tuna fisheries: The Australian legal framework for the transferability of fishing rights has been operating in the country for more than five years and has the advantage of being part of a wider system of managing personal property transactions, which may have wider implications for business.

Reforms based on this model are taking place around the Pacific, with personal property registration legislation now existing in the Marshall Islands, FSM, PNG, Tonga, Fiji, Samoa, Solomon Islands, Palau, and Vanuatu. This legislation could be adapted relatively easily to facilitate transferability of tuna fishing rights—essentially by amending national fisheries legislation to make a fisheries license a registerable instrument. However, registries would need to be designed and implemented from scratch.

Introduction

This chapter considers the legal issues inherent in the introduction of transferability of formal tuna fishing rights in the Pacific, through existing licensing systems that often formalize the rights in licenses for fishing vessels—typically time-limited permits. It considers the legal nature of transferability, including a number of possible advantages and disadvantages in the use of transferability in tuna fishing rights. It then considers the existing licensing arrangements in PICTs for these rights, before turning to the two extent systems permitting transferability in the broader Pacific region, in Australia and New Zealand.

Fishing Rights Specified through Licensing

The legal relationship between the government as licensor and the operator as licensee is one well known and understood. In most common law jurisdictions, a licensee holds a right to undertake an activity, i.e., an authorized user, but the terms of that activity are formally defined by the state in the issue of the license, and do not usually confer any proprietary right upon the licensee. As such a licensee has a legally enforceable right to access and/or withdraw fish from the stock but does not "own" the license in a legal sense. Further, the withdrawal or access right, in the absence of a proprietary interest, is not capable of transmission to another person or entity. As such, in legal terms a license to fish that does not provide for any proprietary interest is not capable of transfer except through whatever statutory structure to provide for the transfer is in place.

Transferability

In a traditional fish licensing arrangement, the characteristic of transferability allows a license holder to pass their right to fish from themselves to another individual or entity, without the license being reissued by government. Formally, this can be achieved in a number of ways. The simplest means is for the license to become a form of personal property or to have some of

proprietary right attaching to it. As such, the license can be passed to another person or entity, and this transfer may be for the payment of a sum of money. In effect, the license becomes tradable, and this transaction can take place independent of the system of government issuance, i.e., in a secondary market. As such, the license will have a capital value that can rise and fall over time in this market, and in certain circumstances can be mortgaged or used as collateral for a loan. This has significant advantages for operators in the industry, as it potentially gives them access to funds to recapitalize vessels or increases the long-term value of their business.

Regional Practice

Although they cooperate closely on fisheries matters, the Pacific Island countries are independent sovereign states, and each has its own legislative schemata for governance of the fisheries occurring at least partially within its EEZ, and issuance of fishing rights in that zone. The following table is a summary of the legal structures for the transferability of fishing rights issued through the formal regulation of fisheries in each PIC, derived from the national legislation and its licensing elements. A description of the applicable national legislation, including the licensing mechanisms is included in Annex II.

Table 1.

State	Transferability
Cook Islands	Government approval only
FSM	No regulations
Fiji	Prohibited
Kiribati	Prohibited
Nauru	Prohibited
Niue	Prohibited subject to Government approval
Palau	No regulations
PNG	No regulations*
RMI	No regulations*
Samoa	Government approval only
Solomon Islands	No regulations*
Tonga	Implicit with change of vessel ownership
Tuvalu	Government approval only
Vanuatu	Government approval only

Note. *indicates that legislation envisages transfer by regulations, but none are present.

A number of conclusions about national practice among Pacific Island countries on transferability of fishing rights can be made:

- No Pacific Island country has a functioning legislative schema allowing for full transferability of fishing rights specified in the fisheries regulation and licensing.
- Most Pacific Island countries have no regulations in place dealing with the transferability of fishing rights.
- Four Pacific Island countries effectively prohibit any transferability of fishing rights.
- Only Tonga appears to permit transferability but ties the mechanism to the ownership of the authorized vessel, effectively preventing a full transferability schema.

It is clear that no Pacific Island country has mechanisms in place that would permit the transferability of fish licenses and permits as transferable access and withdrawal rights. All would require legislative intervention to implement such a scheme.

Legislative Models for Transferability of Tuna Fishing Rights in the WCPO

Within the WCPO there are two legislative approaches to the use of transferability of fishing rights considered here due to their proximity and some existing exchange within the region: Australia and New Zealand. New Zealand was one of the early states to introduce ITQs that permitted transferability of fishing access and withdrawal rights (following examples in Iceland). Australia followed suit some years later. Interestingly and entirely separated from fisheries, Australia subsequently adopted a register-based scheme for the transfer of certain types of personal property interests, which resembled a similar non-fisheries-related New Zealand legislative package. In the past decade, Australia has moved to place the transferability scheme for fishing rights under the general personal property register, while New Zealand has retained its sui generis fisheries scheme. Summaries of both schemes are below, as well as recent developments in the Pacific.

Australia. The Personal Property Security Act, 2009 ("PPSA") is Commonwealth legislation that seeks to reduce the complexity surrounding security interests in personal property by replacing more than 70 existing Commonwealth, State and Territory Acts with a single, national law. The PPSA also creates a single national register for all "Security Interests" by amalgamating the numerous other registers for differing security registers in personal property. It also deals with priorities of competing interests, protection of third parties and provides clearer rules for the creation, extinguishment and enforcement of security interests in personal property. It effectively sets up a "one stop shop" for all these issues.

The PPSA, which came into force on 30 January 2012, applies to every transaction that in substance creates a security interest, without regard to the actual form the parties choose, and it addresses every aspect of secured lending, including the formation of security agreements, publication of security interests, priority between competing claims to collateral and remedies for default. At each of these stages, the PPSA enacts a more or less common set of rules for all secured transactions.

What Interests Are Covered? The PPSA applies to "security interests" in "personal property." Both terms are defined in the Act. "Personal property" consists of both tangible and intangible property. Section 10 defines "personal property" as:

property (including a license) other than:

a. land; or

b. a right, entitlement or authority that is:

(1) granted by or under a law of the Commonwealth, a State or a Territory; and

(2) declared by that law not to be personal property for the purposes of this Act.

A license is included within the definition. Under section 10, "license" is defined as:

…either of the following, if it is transferable by the licensee (whether or not the right, entitlement, authority or license is exclusive, and whether or not a transfer is restricted or requires consent):

(a) a right, entitlement or authority to do one or more of the following:

(i) to manufacture, produce, sell, transport or otherwise deal with personal property;

(ii) to provide services;

(iii) to explore for, exploit or use a resource;

(b) an intellectual property license; but does not include a right, entitlement or authority that is:

(i) granted by or under a law of the Commonwealth, a State or a Territory; and

(ii) declared by that law not to be personal property for the purposes of this Act.

This definition would include fishing rights that are accordingly personal property and subject to the PSSA, provided that they do not fall within the terms of the proviso.

Once property falls within the definition of "personal property," the PSSA deals with "Security Interests" over that personal property. Section 12 defines a "security interest" as:

…an interest in personal property provided for by a transaction that, in substance, secures payment or performance of an obligation (without regard to the form of the transaction or the identity of the person who has title to the property).

The section then provides a long list of examples including fixed/floating charges, chattel mortgages, hire purchase agreements, consignment agreements and certain leases of goods.

The following arrangements are expressly excluded from the new PPSA regime by the Act and Regulations:

- interests of a seller who has shipped goods under a negotiable bill of lading;
- liens arising under statute or general law (e.g., warehouseman's lien, repairer's lien and solicitor's lien);

- interests in land or payments in connection with land;
- transfer of accounts for collection purposes;
- transfer of an account or negotiable instrument to satisfy existing indebtedness;
- interests in fixtures; and
- superannuation interests.

Operation of PSSA. The essence of the PSSA is registration of security interests over personal property. This is particularly vital with respect to enforcement of the security and the priority given to various claimants to the secured personal property. If a security interest in collateral is perfected, it takes priority over another security interest that is unperfected or subordinate (e.g., lesser or later security). As described subsequently, this is based on the New Zealand Act, where a buyer takes free of an unperfected prior security interest, even where the buyer has knowledge of the earlier interest. This is not the case in the Canadian models, on which the New Zealand model was based, where an unperfected security interest has priority over a buyer unless the buyer acquires his or her interest without knowledge of the security interest. The New Zealand and Australian approach takes the view that a simple rule based on time of registration is more efficient and easier to live with than a more sophisticated rule in which knowledge, with its attendant evidential burden and additional complexity, is taken into account.

A security interest is perfected if:

- it is attached to collateral; and
- certain extra steps (possession or control of the collateral, or registration on the Register) have been taken to protect the interest, or the interest is otherwise perfected by virtue of the *PPSA*.

The secured party whose security interest has the highest priority is entitled to enforce its interest ahead of other secured parties. Registration is the key perfection step in relation to intangible property such as licenses or where possession of tangible goods is given up.

The PPSA specifically sets out certain rules to follow when "ranking" creditors and distinguishing between competing security interests. The general rules are as follows:

- perfection of a security interest by "control" will beat any other form of perfection. Practically speaking, control is really only relevant for financial institutions (e.g., a bank has control over the funds in a customer's bank account);
- a perfected Purchase Money Security Interest ("PMSI") has priority over a non-PMSI (even if that non-PMSI is earlier or has been perfected). Importantly, the PMSI claimed by a seller / consignor / lessor of goods will beat a PMSI claimed by a third party;
- a perfected security interest has priority over an unperfected security interest;
- between two perfected security interests, the one which has been perfected for the longest continuous time will take priority;

- between two unperfected security interests, the first to attach will take priority.

The essential lesson is that if a person has a security interest over personal property within the terms of the PSSA it is imperative that such an interest be registered on the Register as soon as possible to obtain priority over any other person with a security interest over the same property.

The Personal Property Securities Register. The Personal Property Securities Register ("the Register") is a single, national online register. It enables secured parties and potential secured parties to search for and register security interests in personal property. It is web-based and accessible 24 hours a day, 7 days a week.

The Register serves two main purposes—protection of holders of security interests by means of registration and its attendant priorities, as described above, and publication of security interests. Publication of security interests is a central PPSA objective. Publication is important, serving as a means of protecting third parties from being misled into believing that the debtor (or "grantor," to use the PPSA terminology) has unencumbered title to its assets. The PPSA uses the term "perfection" to capture the publication idea, and it provides for various methods of perfection including "possession" and "registration." Possession achieves the publication objective because if the secured party holds the collateral, a prospective third-party claimant should realize that the secured party may have an interest. On the other hand, it would be commercially disruptive if possession were the only permissible method of publication, because typically the grantor will need the collateral to earn income to repay the secured party. In other words, there are two competing policy considerations in play: (i) the need to facilitate non-possessory secured lending and (ii) the need to protect third parties. The solution lies in registration.

Registration is a facility for enabling third parties to check for outstanding security interests before they themselves take an interest in the collateral. This was the policy underlying early registration statutes and the same policy underlies the new PPSA registration provisions.

The registration provisions are set out in Chapter 5 of the PSSA and are supplemented by the Regulations. Among other things, the chapter provides for the establishment of the register, spells out the mechanics of registration, specifies the various ways of searching the register, provides for changes to registrations, and regulates potential abuses of the register while also addressing privacy concerns.

Under Chapter 5 of the PSSA and the Regulations, registration is achieved through the preparation and submission of a "financing statement." Under s.10, "financing statement" means data registered (or to be registered) pursuant to an application for registration under subsection 150(1). Section 150(3) provides that, to register a financing statement, the secured party must apply to the Registrar in the approved form and pay the prescribed fee. A registration becomes effective from the moment it becomes available for search on the register.

Accuracy in registration is essential. A mistake in the financing statement can invalidate the registration. The governing provisions are ss.164–5. Section 164(1) provides that a registration error invalidates the financing statement if it is either a seriously misleading defect or a defect mentioned in s.165. Section 165(a) applies to serial number errors in cases where inclusion of

the serial number in the financing statement is mandatory and the failure to include the serial number makes the registration undiscoverable by a serial number search. Section 165(b) applies to errors in the grantor's details where inclusion of the serial number in the financing statement is not mandatory and the error in the grantor's details makes the registration undiscoverable by a search against those details.

A secured party can amend a registration, for example to change the registration period, to change the grantor's details or to discharge a registration before the end of the registration period. The method for making amendments is to register a financing change statement.

Where the collateral is transferred, the PSSA requires the owner of the security interest to amend its registration to record the fact of the transfer. This procedure is governed by s.34 of the PSSA. Under this section, the original registration becomes ineffective but provides that the registration is temporarily perfected for 24 months from the date of transfer. If, however, another security interest attaches to the collateral after the transfer this period of grace is reduced to five days to enable the owner of the security interest to amend its registration. If the amendment is made in this time, the original perfection by registration and the attendant priority of the security interest is maintained. If the amendment is not made, then the original security interest will become unperfected and the original security owner loses its priority.

Some pre-PSSA legislation required periodical renewal of registration. The PSSA does not require renewal and it continues until a date prescribed under s.153 of PSSA under which most registrations expire after 25 years from registration or amendment of registration or is otherwise terminated by the owner of the security interest.

It is not compulsory to register a security interest over personal property and the PPSA does not automatically invalidate a security interest if the secured party fails to register. However, failure to register is likely to result in the security interest being unperfected, unless the secured party has perfected by some other method, such as by taking possession of the collateral. An unperfected security interest is vulnerable to various third parties: a buyer or lessee of the collateral for value; another secured party who has a perfected security interest in the same collateral; an execution creditor; and the grantor's liquidator or trustee in bankruptcy. By perfecting a security interest (which will occur most commonly by registration on the Register), the security interest will have priority over an unperfected security interest or general security interest; will survive the grantor's insolvency / bankruptcy (whereas an unperfected security interest will not); will, in some cases, survive the sale of the collateral (whereas an unperfected security interest will not).

New Zealand. The Australian Personal Property Securities Act 2009 ("Australian PPSA") is based largely on the equivalent New Zealand legislation. New Zealand's Personal Property Securities Act 1999 ("NZPPSA") came into force on 1 May 2002 and itself drew heavily on North American models, particularly Article 9 of the United States Uniform Commercial Code and the Personal Property Securities Acts of the Canadian provinces of Saskatchewan and New Brunswick. However, the NZPPSA went further than the Canadian models. Under the NZPPSA, a buyer takes free of an unperfected prior security interest, even where the buyer has knowledge of an earlier interest. This is not the case in Saskatchewan where an unperfected security interest

has priority over a buyer unless the buyer acquires his or her interest without knowledge of the security interest. The New Zealand approach takes the view that a simple rule based on time of registration is more efficient and easier to live with than a more sophisticated rule in which knowledge, with its attendant evidential burden and additional complexity, is taken into account.

The NZPPSA, while it is closely similar to but not identical with the Australian PPSA, works in the same manner as the Australian PPSA. Like the Australian PPSA, the NZPPSA repealed a number of statutes which previously regulated personal property securities, and created a unitary notice system for these securities based on the notion of a "security interest"—a term, in essence, for a charge over another person's assets or undertaking, and one of many key concepts introduced to New Zealand jurisprudence by the PPSA. As with the Australian PPSA, the fundamental concept in the NZPPSA is "perfection"; a perfected security interest will take priority over an unperfected security interest. "Perfection" is achieved by a combination of "attachment" and registration. Registration is achieved by registering a "financing statement" summarizing the nature of the security interest on the Personal Property Securities Register established by the NZPPSA. Additionally, it has broadened the common law conception of a security interest and has implemented a new electronic notice registration system for interests in personal property.

The priority system in both systems is that among secured creditors, the first secured creditor that files a financing statement, has possession of the collateral, or has otherwise perfected the security interest acquires priority over subsequent secured creditors in the same collateral. The date that the security interest is created (attached) or the knowledge that other secured parties exist is irrelevant to this priority scheme. As mentioned earlier, while this this priority structure is largely consistent with Article 9 of the United States Uniform Commercial Code and the Canadian PPSAs it differs from the U.S. and Canadian legislation where an unperfected security interest has priority over a buyer unless the buyer acquires his or her interest without knowledge of the security interest.

A major difference between the Australian PPSA and the NZPPSA is the coverage of the legislation. This is evident from the difference in the definition of the "personal property" which can be registered, in the two Acts.

The NZPPSA definition is narrower than the Australian PPSA definition in that it defines "personal property" in s.10 in an inclusive manner as:

personal property includes chattel paper, documents of title, goods, intangibles, investment securities, money, and negotiable instruments.

As a matter of construction, if the item in question does not fall within any element of this definition then the Act effectively does not apply to it since under s.4 the Act is concerned with interests in personal property. Nor can the eiusdem generis rule assist to expand the list of included items as there are no general words, such as "or like matters," after the specified items. Therefore, according to general rules of statutory interpretation only the listed items, as defined in the Act, constitute personal property for the purposes of the NZPPSA.

The definition of "personal property" in the Australian PPSA is arguably wider. As described in the earlier section, the term is defined by exception rather than inclusion. The definition states that personal property is simply "property (including a license)" with the exception of a number of specified items. However, the term "property" is not defined in the Australian PPSA. Further, there is no definition of "property" in the Acts Interpretation Act, 1901 (Cth) (although there is in the interpretation legislation of NSW, Queensland, and ACT). Therefore, any definition must rely on the common law. In law, the term "property" is perhaps more accurately or commonly used to describe types of rights—and rights in relation to things. In Yanner v Eaton, (1999) 201 CLR 351, the High Court of Australia said at 365–366:

The word "property" is often used to refer to something that belongs to another. But ... "property" does not refer to a thing; it is a description of a legal relationship with a thing. It refers to a degree of power that is recognised in law as power permissibly exercised over the thing. The concept of "property" may be elusive. Usually it is treated as a "bundle of rights."

The end result of this is that under the Australian PPSA the definition of personal property is quite wide. It is wider still with the specific inclusion of a "license," which, as described earlier, is also quite extensive.

Pacific Developments. A number of Pacific Island countries have moved to adopt their own versions of personal property registration and transfer legislation in the past 15 years. This has been part of a common push throughout the WCPO region to have similar legislation with respect to personal property transactions. The legislation is typically analogous to the Australian legislation, and each State maintains its own searchable website for the registration of these interests. This effort was funded by Asian Development Bank, and the Governments of Australia and New Zealand. A list of the legislation is contained in the following table:

Table 2.

State	Personal Property Legislation
Cook Islands	-
FSM	Secured Transactions Act (2014)
Fiji	Personal Property Securities Act 2017
Kiribati	-
Nauru	-
Niue	-
Palau	Palau Secured Transactions Act (2012)
PNG	Personal Property Securities Act 2013
RMI	Secured Transactions Act (2007)
Samoa	Personal Property Securities Act 2013
Solomon Islands	Secured Transactions Act 2008
Tonga	Personal Property Securities Act 2010
Tuvalu	-
Vanuatu	Personal Property Securities Act 2008

The advantages these pieces of legislation provide are many:

- The legislative packages are similar across the region, allowing multinational financial institutions to become familiar with them.
- The systems create registries which are transparent and searchable.
- All are designed to manage transactions involving a variety of types of personal property.

As mentioned previously, few states in the Pacific have established transferability of any type of fishing right issued, into their fisheries legislation. The principle advantage is that the legislation to handle the legalities of transferability, were such a change implemented, already exist in most jurisdictions, and is essentially common across the region. Since the Australian model is already being used for fisheries licenses and quotas, it can be easily adapted for use in the Pacific, should states wish to do so.

PPSA and Fisheries Rights in Australia and New Zealand

Australia. Under the main Australian fisheries management legislation, the Fisheries Management Act 1991(FMA), there was a move from the previous, traditional "input" controls to one of "output" controls under which fisheries are managed through Fisheries Management Plans which set quotas for various species of fish for which rights to exploit these quotas could be granted.

Under the FMA these fisheries rights fall mainly into two categories–statutory fishing rights under s.21 and fishing licenses under s.33.

The next question then concerns whether or not these fishing authorizations constitute "property." As discussed earlier, at common law, the meaning of "property" in Australian law is quite wide. However, fishing entitlements are almost always creatures of statute and whether or not they are "property" becomes a question of statutory interpretation. Their status has been interpreted by the courts of both the States and the Commonwealth. These courts have generally acknowledged that various fisheries authorizations in the form of licenses are capable of being considered "property." For example, in Bienke and Others v Minister for Primary Industry and Energy and Others (1996) 135 ALR 128 Full Court of the Federal Court of Australia found that a fishing boat license creates a species of statutory entitlement dependent on the terms of the statute. In Gasparinatos v State of Tasmania (1995) 5 Tas. R. 301, the Tasmanian Supreme Court held that fishing rights were "capable" of being valuable property rights and in Pennigton v McGovern (1987) 45 SASR 24 the South Australia Supreme Court held that a fishing license did confer proprietary interest since it had the indicia of property under the relevant statute. In the context of the PPSA, the definition of "license" in s.10, makes it clear that a statutory license is personal property for the purpose of the statute except where the license is nontransferable or the statute under which the "license" is granted declares the license not to be personal property for the purposes of the PPSA. Also, the definition of "license" specifically includes a transferrable right to explore for, exploit or use a resource where such right is granted by or under a law of the Commonwealth, a State or a Territory and is not declared by that law to be personal property for the purposes of the PPSA. Thus, under the Australian PPSA rights to exploit fisheries would be

personal property and covered by the PPSA unless it is nontransferable, or the relevant fisheries legislation states otherwise. Therefore, the fisheries legislation must be examined on both points to determine if the licenses granted under it falls within either of these provisos.

In Australia, fisheries jurisdiction is divided between the Commonwealth and the various states and the Northern Territory. Under the Offshore Constitutional Settlement, the jurisdiction of the States and Territories is from the low water mark seaward for three nautical miles and the jurisdiction of the Commonwealth extends seaward from three nautical miles. The Commonwealth and all States and the Northern Territory have fisheries legislation under which fishing rights are granted for the relevant waters.

To determine whether or not a particular fishing right is caught by the PSSA, the legislation of the Commonwealth, state, or territory which grants the license has to be examined on the two provisos of transferability and applicability of the PSSA. For the purposes of this exercise, given a large majority of commercial fisheries are regulated by the Commonwealth, its legislation will be used as the exemplar.

Under s.48 of the FMA, the holder of a fishing right can deal with the right as its absolute owner, which would include the right to transfer the right. However, under s.49, where the right is to be transferred, the Minister must approve the transfer, but consent cannot be refused unless it is contrary to the relevant plan of management or a condition of the fishing right.

In relation to the applicability of the PPSA, amendments have been made to the FMA by the Personal Property Securities (Consequential Amendments) Act 2009. The amendments to the FMA do not declare that licenses issued under the FMA are not personal property for the purposes of the PPSA. Therefore, the PPSA does apply to fishing rights under the FMA. However, the way in which the PPSA operates in relation to such fishing rights is not straightforward. The PPSA does not abolish the previously existing register of fisheries rights set up under s.46 of the FMA but operates alongside the register set up under the PPSA. The amending Act inserts s.46A into the FMA to determine the priorities of interests. In effect registration under s.46 continues to have priority over other interests in the same property unless a security interest over that property under the PPSA is perfected at which stage the PPSA security interest has priority.

New Zealand. New Zealand has sought to achieve sustainable fisheries development primarily through the declaration of a total allowable catch subdivided into ITQs, and the legislation and administrative machinery for this were designed accordingly. From the inception of the system, the governing legislation has contained detailed provisions for the creation and protection of ITQs. The policy intention has always been to create a legal entity which is as close as possible to "property," in the sense that property is not a thing but a bundle of rights vested in one or more persons, in relation to the thing. The New Zealand legislation has catered for the most significant rights of this bundle. Once established the Fisheries Act 1996 set up an elaborate and extensive registration system containing details pertaining to registration, with what appears as a deliberate effort to create a virtually indefeasible title to ITQs in s.168. This is supported by s.155 under which no transaction is effective until registered. Detailed registration provisions allow

for transferability and the registration of third-party interests, for both quota and annual catch entitlements.

Transferability has always been possible although it has been subjected to various limitations such as maximum and minimum holdings, which have been altered over the years. Under the Fisheries Act, 1996, the transferability of quota is almost completely unlimited—the only limits imposed are those of registration requirements and anti-monopoly and foreign ownership safeguards. This ease of transfer lies at the heart of the entire quota system—it is transferability which renders a quota such a valuable commodity, and the value realized on transfer which encourages trade, surrender of fishing rights and ultimately a reduction in competitive overfishing.

The registration system set up under the Fisheries Act appears to be separate from the NZPPSA. As discussed earlier, The NZPPSA definition is narrower than the Australian definition in that it defines "personal property" in s.10 in an inclusive manner as:

personal property includes chattel paper, documents of title, goods, intangibles, investment securities, money, and negotiable instruments.

As a matter of construction, if the item in question does not fall within any element of this definition then the Act effectively does not apply to it since under s.4 the Act is concerned with interests in personal property. This definition does not appear to include such items as fisheries rights. This conclusion is supported by s.23 of the NZPPSA which provides that the Act does not apply to a closed list of specific interests set out in the section. For fisheries purposes this exclusion list includes:

(xiii) a transfer or other transaction by way of security in respect of individual transferable quota or transferable term quota (within the meaning of the Fisheries Act 1983) or a transaction of quota or annual catch entitlements (within the meaning of the Fisheries Act 1996).

The aim would appear to be to maintain the registration system in the Fisheries Act alongside the NZPPSA registration system.

Benefits of the PPS System. There are a number of distinct benefits in using what could be called the PPS system (which incorporates the way in which the Australian, New Zealand, and Canadian systems operate). These include transparency, certainty, better access to credit, and digital enablement.

Taking each of these in turn:

Transparency. When it comes to making financial decisions, no one has perfect information. A PPS system provides a degree of transparency by filling this information void—not just for lenders, but for anyone entering into a transactional arrangement. An effective and consistently applied PPS system can increase transparency, thus giving potential suppliers and creditors consistently accurate information on which to base their judgements. Suppliers and creditors would be more willing to enter into agreements on the basis of this information because they are better able to assess the risk of dealing with a particular individual or business.

Publication of security interests is a central PPS system objective. Publication is important, serving as a means of protecting third parties from being misled into believing that the debtor has unencumbered title to its assets. Registration is a facility for enabling third parties to check for outstanding security interests before they themselves take an interest in the collateral.

Certainty. The aim of a PPS system is to provide one system for the registration of all security interests in personal property and provides a more streamlined and accessible system for consumer and business users. A PPS system increases certainty for all users of secured finance by removing barriers that inhibit businesses and individuals from securing credit over personal property. Under a PPS system the rules are applied consistently and predictably, making it easier for borrowers and lenders to manage risk and make informed decisions about transactions

The PPS system should reduce the complexity of and increase consistency in the arrangements for creating, dealing with and enforcing security interests in personal property. In streamlining lending arrangements, a PPS system provides greater certainty for both lenders and borrowers. The system allows both lenders and borrowers to search, at low cost, to see if the property they are considering purchasing or financing is encumbered ensuring that people know that what is being put up for security is not encumbered elsewhere.

Better access to credit. One of the aims of PPS system is to improve the ability of individuals and businesses, particularly small-to-medium size businesses, to use more of their property to secure lending to increase their available working capital. A PPS system allows businesses and consumers to use a far wider range of collateral, basically all types of personal property, to gain access to credit. Borrowers are generally keen to use collateral to secure their loans because it gives them much better credit terms. At the same time, credit is more available in countries where security interests are perfected and a predictable priority system exists for lenders in case of default.

A PPS system should eventually bring down the costs of obtaining credit. It can also increase the propensity of lenders to lend, particularly to small business, thereby increasing the availability of credit within the market. By reducing complexity and introducing greater consistency among the different kinds of secured finance, a PPS system can generate wide-ranging benefits for all parties who secure personal property to raise finance. It will lower the risk for lenders, improve the efficiency of secured financing and increase competitors among providers of finance.

A PPS system should help to meet the needs of businesses and other users of secured finance. It simplifies the way they conduct their business. Small businesses themselves will be direct beneficiaries of a PPS system, which will enable them to use personal property as collateral, thereby increasing their access to finance and reducing costs within their businesses.

Digital enablement. A key element of the PPS system is the creation of a personal property securities register, allowing for the central registration of and search facilities for security interests. As an online service, a PPS system enables all businesses to keep pace and further enable an increasingly sophisticated financial sector that relies on real-time information sharing in a 24-hour economy. The register in a PPS system is fully computerized, a feature which facilitates direct user access to the register database and avoids the need for transcription

of information from registration applications to the register and from the register to search certificates, in contrast to paper-based registration systems. Whereas many of the older registration statutes required the secured party to lodge a copy of the security agreement, the register under a PPS system is based on a notice filing system which is easier and cheaper than document filing.

Conclusions

Both the current Australian and New Zealand schemes for the transferability of fishing rights have been operating for more than five years in their present forms. Most significantly, both have been accepted by Australian and New Zealand financial institutions for the purposes of security over loans. Many fisheries have seen significant capital appreciation with respect to the value of the rights, and the system has been popular with fishers. There is evidence to suggest that domestic compliance has improved, although this can be ascribed to a number of factors, such as the requirement of VMS for most commercial fishing vessels.

The Australian system has the advantage of being part of a wider system of managing personal property transactions, which may have wider implications for business. Reforms of this nature are taking place around the Pacific, with personal property registration legislation now existing in the Marshall Islands, FSM, PNG, Tonga, Fiji, Samoa, Solomon Islands, Palau, and Vanuatu. These Acts are modelled on the Australian system and make the adaption of this legislation to facilitate transferability a relatively simple task—essentially amending national fisheries legislation to make a fisheries license a registerable instrument. This also has the advantage over a sui generis fisheries register like that in New Zealand, which would need to be designed and implemented from scratch.

CHAPTER 6: IMPLICATIONS FOR PACIFIC ISLAND COUNTRIES AND TERRITORIES

Transform Aqorau, Kamal Azmi, Elizabeth Havice, Stuart Kaye, Stuart Kininmonth, Moses Mataika, Sarah McTee, Anthony Morrison, Lars Olsen, Mark Soboil, Siale Suamalie, Salome Taufa, Alice Thomas-Smyth, and John Virdin

6.1 Options for Introducing Transferability of Tuna Fishing Rights in the Short-Term, In Each of the Three Tuna Fisheries

This study has drawn upon a well-established literature on property rights and fisheries management to characterize the types of property rights created by the rules governing tuna fishing at various levels in the Pacific Islands region. On this basis, transferability is defined as the extent to which the rights created can be divided and traded to others, at two different levels: (i) between states, within a framework that allows for transfer of nationally allocated rights among themselves; and (ii) between authorized users, when individual or specific user groups are allowed to trade the rights they receive among themselves (in a secondary market). Evidence from other fisheries based on highly migratory species such as tuna has suggested that prerequisites for transferability are: (i) setting the cap on fishing, including the policy goal that the limit aims to achieve and the approach or type of limits, e.g., effort- or catch-based; (ii) allocating the fishing rights among the group of states, within the cap (i.e., total limits); (iii) member states allocating the fishing rights (for access and withdrawal) to authorized users; and then (iv) states allowing for transferability at one or both levels, between states in step two, and/or between authorized users in step three.

As defined here, transferability between states currently occurs within the purse seine VDS and is possible within the longline VDS. However, in the absence of a cap on fishing for the fishery and an allocation framework for that cap, the prerequisites for transferability between states have not yet been met in the southern albacore longline fishery. In terms of transferability between authorized users, these prerequisites have not yet been met in the tropical longline fishery, where roughly half of the catch is typically taken in international waters and EEZs outside of the jurisdiction of PICTs (e.g., Indonesia).

Similarly, in the southern albacore longline fishery, catches in international waters have typically been on the order of one third of the total—presenting a challenge that may perhaps be surmountable with cooperation by the states with jurisdiction over the zones where the other approximately two-thirds of the catch is taken. For the time being, without the first condition met, there is not currently a scarcity on access and withdrawal rights in these two longline tuna fisheries that would support a secondary market with transferability. Essentially, if transferability of tuna fishing rights between users can be considered as a "cap and trade" scheme, then without the cap, there is no trade to be made. For this reason, one respondent to the interviews suggested that it may be easier to focus first on expanding state-to-state transfers in the longline VDS, for example through additional PICTs joining the VDS, and another suggested a priority, or the southern albacore longline fishery would be a single management system.

In the purse seine fishery, the prerequisites have been met and the TAE offers a cap that creates a potential opportunity for trades that may increase the profitability of the fishery and hence the rent that can be gained by participating PICTs as public revenues, towards that objective of the Regional Roadmap. Such a shift in governance could be characterized as an adjustment within the VDS from individual allocations of effort (IE) to allocations of individual transferable effort (ITE) rights.

6.2 Opportunities for PICTs from the Option of Introducing Transferability between Authorized Users in the Purse Seine Fishery

The literature on property rights in fisheries suggests that allowing transferability of fishing rights between uses can help increase the overall economic outcomes from the fishery, by creating a market mechanism to ensure that marginal benefits are equalized. Essentially, if one economic agent can fish more profitably than another (for a variety of reasons, e.g., because the latter's fishing vessel experiences maintenance problems, or more broadly in response to changes in technology, markets, resource conditions and the environment), but lacks the right to carry out that additional harvesting, it could purchase the right from the less efficient agent and increase its profits as well as the overall static (and dynamic) efficiency of the fishery. Both parties benefit, because the purchaser buys the right at a price that allows them to conduct the additional fishing profitably, and the seller sells that right because the profits from the sale are higher than what they could have generated from using the right to fish. Profits are increased for both participants in the trade (the gains of the trade), and thus the fishery as a whole—increasing the maximum attainable public revenues that PICTs could obtain from license fees. The more trading that occurs in the fishery, the greater the gains in profitability assumed for the fishery as a whole. The option to trade access or withdrawal rights has also been used to increase efficiency in the use of other common pool resources, e.g., grazing rights, water rights, development rights for land use, etc.

In the case of the purse seine fishery in the short-term, the thought exercise performed in Chapter 4 suggests that these benefits are likely to be modest for PICTs with high productivity within their zones of jurisdiction (in terms of both fishing catch and effort, e.g., the Federated States of Micronesia, Kiribati or Papua New Guinea), and negligible for PICTs with lower productivity within their zones (e.g., the Republic of the Marshall Islands or Tuvalu). For the more PICTs with jurisdiction over more productive zones, introducing transferability among authorized users has the potential to increase benefits to the country in some scenarios by an amount on the order of 1 to 2 percent of current public revenues from access fees. This is not a prediction with any level of certainty, but rather the results of the model in order to indicate the scale of potential economic benefits from this change, based on scenarios developed with expert judgment of the authors and publicly available data on the tuna fisheries in the region. This analysis was also bounded by the policy goals in the Regional Roadmap, which include employment for nationals of PICTs in the fishery, and for this reason considered only transferability among foreign users—assuming that less profitable domestic agents would sell rights to foreign operators and thereby reducing employment by PICT nationals. Allowing transferability among both domestic and foreign agents in a given zone could further increase profitability and public revenues to PICTs, but potentially at the expense of the other goal in the Roadmap for employment.

While significant for PICTs with higher purse seine productivity in their EEZs, the relatively modest economic gains from allowing transferability between users may reflect several factors: small market size for trading in any one zone, the consideration that many economic agents are vertically-integrated and generate the majority of profits higher in the value chain while operating in the harvesting segment closer to the break-even point, and the limited transferability that already exists between agents registered in the same country via associations or collectives (which may include fleets of as many as 20–30 vessels).

Essentially, the higher the volume of trading that would occur the greater the efficiency gain for the fishery can be assumed, but given all of these previous factors trading is assumed to be relatively limited within current zones of the purse seine fishery (many zones may not be large enough and productive enough for transferability to allow for significant trading). Additionally, as one respondent noted, given the relatively short duration of the rights (one year), transferability is not necessary in order to facilitate efficiency gains from newer, more efficient operators replacing older, less efficient ones—the newer operators can simply outbid the older ones the following year.

The models also do not account for transaction costs and learning associated with maintaining and monitoring of a transferability scheme. Given the small potential gains projected, these costs could be significant to overall gains.

Risks to PICTS from Introducing Transferability between Authorized Users in the Purse Seine Fishery

In theory, a risk in cap and trade programs such as an ITE system, would be if firms exhibit monopolistic behavior and try to hoard rights strategically to prevent competition and eventually increase bargaining power with PICTs over pricing (particularly if operating costs are uneven in the fishery because of subsidies or some other form of state support to particular fleets or firms). This risk coincides with a concern expressed by a number of respondents in the interviews, that with increased transferability of tuna fishing rights, PICTs might lose some control or sovereignty over the fishery. Building off of examples in some ITQ fisheries, though not necessarily those governed with ITEs, PICTs could specify concentration limits, whereby no one firm can own more than a specified percentage of the total rights issued at any one time.

Additionally, a concern for achievement of PICT policy goals stated in the Roadmap would be a loss of employment by nationals in the fishery, as a result of transfers from domestic to foreign firms. The increase in efficiency at the level of the fishery and hence public revenues captured by PICTs, could be offset by losses in employment such that one policy goal is traded for another. To mitigate this risk, PICTs could allow transferability only between authorized users in the purse seine fishery that are foreign firms, and this constraint was included in the scenarios modelled in the case studies. These two distributional concerns are similar to challenges that have been identified in the broad literature on strengthening property rights to achieve economic gains in fisheries.

Some respondents perceived risks to sustainability if transferability increased the probability of "fishing effort creep,"20 where less effective harvesters sell to more effective harvesters, and this

risk has also been highlighted in literature on other ITE systems around the world (Anderson et al. 2018, Squires et al. 2017, Townsend et al. 2008). If a given number of fishing days authorized by PICTs can be translated into more effective fishing effort by trading, than the gains from trading would be reduced over time as catch rates increase and the stocks decrease (and subsequently so does the cap, i.e., the PAE) (Arnason et al. 2015).

Currently the purse seine VDS uses conversion factors to make continuous adjustments aiming to ensure that nominal effort reflects the harvesting capacity of the fishing vessel, by adjusting days based on the size class of the vessel (e.g., longer vessels may be accounted as using 1.5 days for every one day fished) (Havice 2013). However, trading mechanisms would need to account for this difference, such that aggregate effective fishing effort does not increase while nominal fishing days remain the same.

An additional risk perceived by respondents in the interviews included the challenges of administering trades such that they are formal and monitored by the state, to ensure compliance. Transferability requires transparency and accountability to reduce transaction costs and inspire confidence in the trading mechanism (Sterner 2003). This has been achieved in some cases through the administration of a registry supported by legislation (see Chapter 5) and could in theory a vessel day registry be added to the iFIMS, updating trading information in real time while maintain confidentiality (Arnason et al. 2015).

Table 1. Summary of Opportunities and Risks to PICTs from Introducing Transferability between Authorized Users in the Purse Seine Fishery

Opportunities	Risks [possible mitigation measures]
• Increased profitability in the fishery, a portion of which could be captured by PICTs as public revenues, potentially on the order of 1 to 2 percent of current revenues for PICTs with more productive zones for purse seine fishing, if trading is limited to vessels registered in foreign countries	• Industry consolidation and monopolistic behavior to affect PICT pricing of fishing days [*PICTs specify concentration limits*] • Loss of employment in the fishery by PICT nationals, if trading is permitted between domestic and foreign-registered fleets [*PICTS only permit trading between foreign-registered vessels*] • Effort creep in the fishery that reduces fish stocks [*Registry, e.g., iFIMS, accounts for the difference by adjusting nominal days in the trade to fit vessel size class*] • Challenges to PICTs of administering trades [*Build vessel day registry on to the existing iFIMS system*]

Legal Requirements for Transferability of Tuna Fishing Rights between Authorized Users

No PICT currently has legislation in place that would permit the transferability of tuna fishing rights between authorized users (and four PICTs effectively prohibit such transferability)—all would require legislative intervention to make this governance change. Looking to nearby examples in the region, both Australia and New Zealand have legislative frameworks to support transferability of fishing rights and may offer examples for PICTs should they wish to pursue transferability. The Australian legal framework for transferability of fishing rights has been operating for more than five years and has the advantage of being part of a wider system of managing personal property transactions. Reforms based on this model are taking place around the Pacific, with personal property registration legislation now existing in the Marshall Islands, FSM, PNG, Tonga, Fiji, Samoa, Solomon Islands, Palau, and Vanuatu.

This legislation in PICTs could be adapted relatively easily to facilitate transferability of tuna fishing rights—essentially by amending national fisheries legislation to make a fisheries license a registerable instrument. However, registries would need to be designed and implemented from scratch. More generally, legal frameworks do not appear to be a barrier to this change in governance, should PICTs wish to allow transferability of tuna fishing rights between authorized users.

Implications for PICTs Going Forward

Transferability of tuna fishing rights between authorized users is feasible in the short-term in the purse seine fishery, but not likely in the longline fisheries since required pre-conditions have not yet been met. In the purse seine fishery this is feasible legally with relatively simple changes to national fisheries legislation to make tuna fishing rights registerable instruments, though would require additional administration, including a registry (e.g., building upon iFIMS). While feasible, the economic gains to PICTs participating in the purse seine VDS are likely to be modest due to relatively small secondary market sizes in each EEZ and limited largely to those PICTs with jurisdiction over more productive zones. This suggests that introducing transferability of fishing rights between authorized users in the purse seine fishery may be a lower priority for PICTs, compared to some of the other options identified in Chapter 2 to strengthen the property rights characteristics of the authorizations they issue to fish for tuna in their zones.

Given the slowing growth of the economic gains to PICTs from the purse seine fishery, and the economic stagnation of the longline fisheries, strengthening the property rights characteristics of tuna fishing rights authorized by PICTs in each of these fisheries still holds potential for advancing the goals of the Roadmap. However, allowing transferability of those rights between authorized users may not be the first priority toward strengthening these characteristics. Revisiting the framework suggested in Chapter 2 may help to identify some clear options for further evaluation by PICTs, in order to strengthen the property rights features of the tuna fishing rights that they create in each of their respective EEZs or zones.

Table 2. Overview of Tuna Fishing Rights in the Purse Seine and Tropical Longline Fisheries

	Theory (e.g., type of rights holder)	Spatial Coverage	Stringency	Time	Transferable (yes/no)
Regional	Western and Central Pacific Fisheries Commission (WCPFC) = claimant/ proprietor (specifies rules for states, fleets)	WCPO (100% match)	Low	Unlimited	No transfers between RFMOs
Sub-regional	PNA = proprietor (specifies total effort, and portion allocated to members)	9 EEZs (purse seine ~75% of the fishery; longline ~30% of the fishery)	Medium	PNA total allowable effort determined annually. Right to utilize fishery held in perpetuity.	No transfers between subregional groups
National	PICTs = resource owner (specifies individual effort authorizations, as fishing vessel days)	PICTs issue access rights for EEZs*	High	The formula for Parties' allowable effort not fixed, and must be recalculated each year, though PICTs' rights to fish resources in EEZs held in perpetuity	Yes, transfers allowed between PICTs
User	Individual entity (e.g., fishing companies) = authorized users	Authorization for specific EEZ only	High	1 year	No

Note. Cells shaded in red are highlighted as particular characteristics of rights that could be strengthened. *In some cases, the Parties to the Nauru Agreement (PNA) have cooperated to issue individual effort authorizations to vessels, for a space larger than any one EEZ, but for the space equivalent to their collective EEZs.

Although a number of the characteristics described in the table above could be modified in different ways by PICTs, several examples are selected here (and highlighted in red in the table above), based on recent proposals or experiences in the literature in other fisheries.

For the purse seine fishery, options to strengthen the property rights characteristics of tuna fishing rights include:

- ***Expanding cooperation [subregional]***: At the subregional level, expanding the group of cooperating states that function as the proprietor, from the 9 PNA members, to include a greater share of the fishery and expand the cap on fishing—e.g., the countries described by Arnason et al. (2015) as "the competitive fringes," Indonesia and the Philippines, or other PICTs not currently participating as Parties to the Nauru Agreement;
- ***Securing the allocation for each cooperating PICT [national]***: At the national level, securing the agreed allocation within the cap (TAE) to each PICT participating in the governance as a Party to the Nauru Agreement, rather than changing this allocation over time based on the trend in fishing within the respective EEZs;

- ***Increasing pooling [national]***: At the national level, continue to increase the space over which tuna fishing rights are issued, i.e., the number of zones to which a fishing day applies, through "pooling" (which would increase the size of the secondary market for transferability of tuna fishing rights between authorized users, and likely the demand for trades);
- ***Extending the duration of tuna fishing rights [user]***: For users, PICTs could collectively or individually begin to extend the duration of the time period prescribed in the tuna fishing rights that they issue, e.g., from one year to three, five or even ten years; and
- ***Allowing transferability of tuna fishing rights between authorized users [user]***: As described previously, allowing authorized users the flexibility to trade tuna fishing rights that cover a larger space and extend over a longer period time.

For the long line fisheries, the prerequisites to transferability would suggest also priorities for strengthening the property rights characteristics of fishing rights more broadly, and include:

- ***Expanding cooperation [subregional]***: particularly in the tropical longline fishery, where the VDS currently governs approximately 30 percent of fishing effort;
- ***Setting the cap on fishing [subregional***]: such that total fishing catch or effort supports achieving the goals in the Roadmap, to the extent that PICTs are able to include enough states and their respective zones in the group cooperating (previous step), that the rules they agree can affect total fishing catch or effort; and
- ***Allocating the fishing rights among the group of cooperating states [subregional***]: where the quantity in the cap is divided among the participating states.

All of these options in both the purse seine fishery and the longline fisheries would be expected to have both costs and benefits for PICTs, but further study would be needed to estimate these. For the moment, they may be considered as policy options for strengthening the property rights characteristics of the authorizations issued to users to fish for tuna, each of which would need to be further evaluated in a given context.

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ANNEX I. BACKGROUND ON GOVERNANCE CONCEPTS UNDERPINNING THE STUDY, AND OVERVIEW OF CURRENT PACIFIC TUNA FISHERIES GOVERNANCE

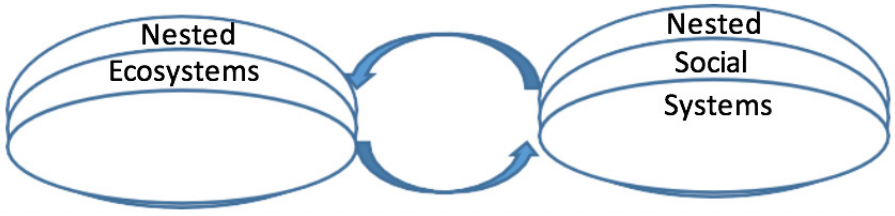
The Units of Analysis: A Fishery as a Socioecological System

Garcia and Charles (2007) wrote that while simple, predictable, mechanistic systems have been referred to as "clockworks," fishery systems are complex, imperfectly predictable, dissipative structures that could be referred to as "soft watches" based on Salvador Dali's 1931 painting to indicate that things may not be as rigid as usually assumed. The application of "systems thinking" to study outcomes from complex interactions has been growing over the last few decades (Senge, 1992), particularly in the case of human interactions with the natural environment such as occurs in fisheries (Ommer et al., 2011; Perry et al.

2010; Levin and Clark, 2010; Lui et al. 2007; Berkes et al. 2003). Such human-environment interactions have been described as coupled social and ecological systems that are interdependent and co- evolutionary, as part of an interdisciplinary "science of sustainability" featured in the Millennium Ecosystem Assessment in 2005 and now in the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, for example (Diaz et al. 2015; Levin and Clark, 2010; MEA, 2005; Vitousek et al. 1997).

This conceptual framework for studying human-nature interactions such as fisheries has been summarized as a dynamic interaction between people and other parts of ecosystems—or a socio-ecological system (SES)—where the changing human condition both directly and indirectly changes ecosystems and where changes in ecosystems cause changes in human well-being. As the same time many other factors independent of the natural environment change the human condition, and many natural forces are influencing ecosystems (Berkes and Folke, 1998). Essentially, the SES framework is a "concise summary in words or pictures of relationships between people and nature," depicting key social and ecological components and the relationships between them (Diaz et al. 2015). Figure 1 below provides an illustration of such a framework in the most basic sense: with interlinked components representing natural and social systems.

Figure 1. Simplified Socioecological Systems (SES) Framework

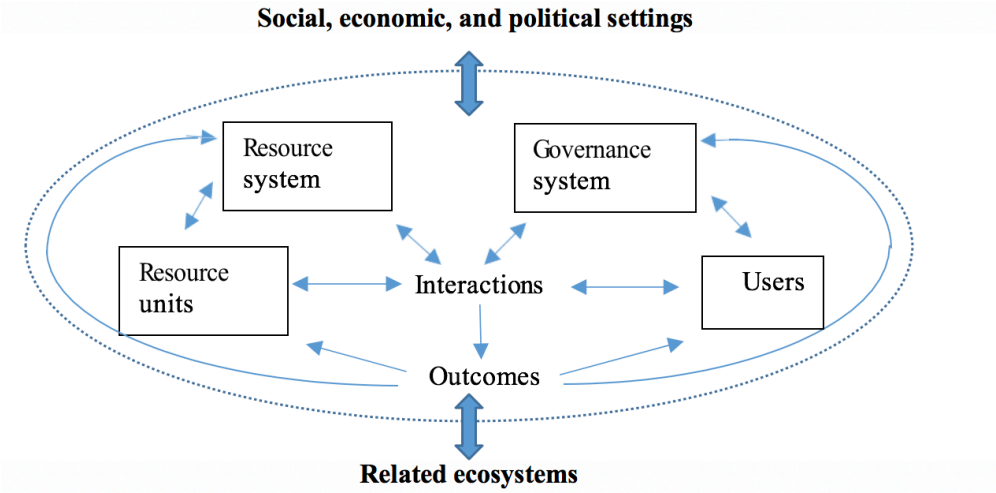


Source: Re-drawn from Ommer et al. (2011)

While Figure 1 provides a basic illustration, most systems characterized by such frameworks have complex dynamics and thresholds, with multiple scales and possible outcomes, and inherent uncertainties (Wilson, 2006; Hughes et al. 2005). Ostrom (2009) described the framework in more detail, noting that all human-used resources such as fish stocks are embedded in complex socio-ecological systems composed of multiple sub-systems and internal characteristics (with specific variables) within these sub-systems at multiple levels, "analogous to organisms composed of organs, organs of tissues, tissues of cells, cells of protein, etc." As shown in Figure 2, Ostrom (2009) included the following components (or sub-systems, which are made up of multiple variables at different levels) and interlinkages between them (in the form of measurable interactions and outcomes):

- *Resource system*: such as a specified zone containing fish stocks;
- *Resource units*: such as fish;
- *Governance system*: e.g., the government and other organizations that manage fishing, the specific rules related to fishing, and how these rules are made; and
- *Users*: e.g., individuals who use the fish stocks in various ways, such as fishers.

Figure 2. Ostrom's Socioecological Systems Framework



Source: Ostrom (2009)

SES frameworks have been adapted and developed in numerous fields and contexts to address the complexity of different socio-ecological systems studied in sustainability science, for example including exogenous drivers of the system such as climate change (Folke et al., 2005), and built physical systems or infrastructure (i.e., anthropogenic assets) in addition to biophysical systems (Anderies, 2015). As mentioned previously, a widely used version of the framework informed the 2019 assessment of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem

Services (IPBES, 2019), and included the following general components that may operate at various scales in time and space:

- *Nature or the natural system* (analogous to the resource system), e.g., the ecosystem and the fish stocks it supports;
- *Nature's benefits to people* (analogous to the resource units), e.g., ecosystem services such as provision of food;
- *Anthropogenic assets*, including built infrastructure, knowledge, technology, etc., such as ports, processing facilities and fishing vessels;
- *Institutions and governance systems and other indirect drivers* (analogous to the governance system), i.e., the underlying causes of change that are generated outside the ecosystem in question, and are considered indirect because in the vast majority of cases they do not affect nature directly, but rather through their effect on anthropogenic drivers;
- *Direct drivers of change in nature, both natural and anthropogenic,* e.g., natural climate and weather patterns and fishing, respectively; and
- *Human well-being* (analogous to outcomes), e.g., food security from the ecosystem service (Diaz et al. 2015).

The interactions or linkages between these components are described in general terms. For example, a society's vision of a good quality of life and human well-being may drive the governance system that it creates, which will regulate direct anthropogenic drivers of change in the ecosystem such as fishing, which results in a fish yield that is part of nature's benefit to people, drawing upon anthropogenic assets such as ports and fish processing facilities to provide food for consumption in society, and food security as a part of human well-being (Diaz et al. 2015).

Describing Pacific Island Tuna Fisheries as Socioecological Systems

The various components of a generic Pacific Islands tuna fishery can be described using a SES framework, building off of the example in Diaz et al. (2015) applying the Intergovernmental Science – Policy Platform on Biodiversity and Ecosystem Services (IPBES) conceptual framework to a marine fishery:

- *The natural system or ecosystem* determining the size and abundance of the tuna stocks can be described in terms of the interaction of a large number of biophysical variables (Garcia and Charles, 2007). A key variable is the spatial extent of natural system, described in Article 3 of the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (WCPO);[21] *The ecosystem services or resource units* can be described as provisioning of food, in terms of the yield from the fishery or the landed catch (in metric tons);
- *Anthropogenic assets* can be described in terms of the harvest assets (fishing vessels, both in size,

i.e., number of vessels, and distribution, i.e., country where the vessel is registered or flagged) and post-harvest assets (port and processing facilities, described by a range of variables to measure the size, including capacity, costs, etc., as well as the distribution, by location) – all of which are developed and operate at different levels in the system, from national to regional and even globally (Drakou et al., 2018; World Bank and Nicholas Institute, 2016; Hamilton et al. 2011);

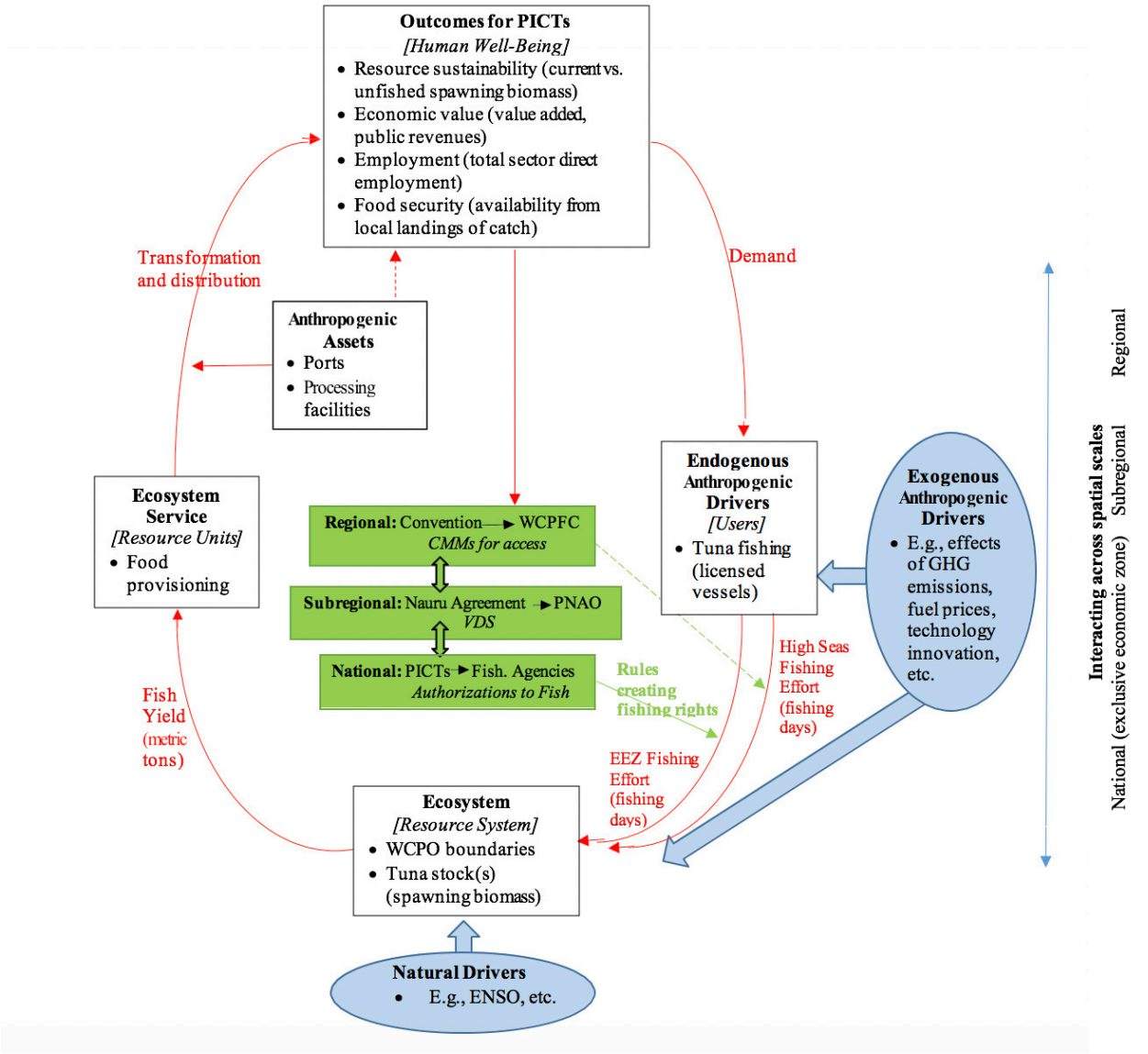
- *Governance system,* defined and described in Pacific Island tuna fisheries as formal institutions and organizations (see section 2.2) and the fishing rights that they create (see section 2.3);
- *Anthropogenic drivers of change*, distinguished here between endogenous anthropogenic drivers (fishing effort[22] by the tuna vessels) and exogenous drivers related to the social, political and economic setting in which the system occurs (e.g., effects of greenhouse gas emissions, global market demand for tuna consumption, macroeconomic forces such as fuel prices, etc.);
- *Natural drivers of change*, such as the El Nino Southern Oscillation (ENSO) and other natural climate and weather patterns; and
- *Outcomes* sought in the Regional Roadmap: tuna fish stock sustainability, increased economic value to PICTs from the tuna fisheries, greater employment in the fisheries for nationals of Forum members and increased local consumption of tuna catch (FFA and SPC, 2015).

The interactions between these components include exogenous anthropogenic drivers of change such as the effects of greenhouse gas (GHG) emissions or global markets, that interact with both the endogenous anthropogenic drivers (e.g., global markets affecting fishing behavior) and the natural system. The endogenous anthropogenic driver of fishing interacts with the natural system through fishing effort, and the result of this interaction is the fish yield (i.e., harvest) that provides an ecosystem service that is transformed and distributed to people with the use of anthropogenic assets (e.g., ports and processing facilities), in order to affect human wellbeing (i.e., outcomes for Pacific Island countries and territories). Governance interacts with the anthropogenic driver of fishing through regulation of effort and/or yield, as well as with the anthropogenic assets and more broadly with the outcomes achieved. At the same time, society's vision for governance, including specific instruments of governance, can change based on the outcomes generated from the system.

Figure 3 provides a simplified SES framework to describe the various components and relationships included in the three main tuna fisheries that affect the outcomes sought for PICTs in the Regional Roadmap. The components and interactions are adapted from the IPBES conceptual framework, which in turn is based on the general framework developed by Ostrom (2009). Although still a relatively new area of research, such SES frameworks have already developed a large and supporting literature in sustainability science, based on extensive theoretical and empirical analysis (Ansell and Torfing, 2016). In this case a very general framework has been proposed for illustrative purposes only. Of note, this conceptual framework describes a highly industrialized and commercialized human-nature interaction, and so relies

on knowledge systems and terminology from what Diaz et al. (2015) call Western science, while acknowledging other knowledge systems such as indigenous and local knowledge. However, it aims to help define the units of analysis for consideration of governance changes in the context of PICT tuna fisheries, and specifically transferability of fishing rights.

Figure 3. Conceptual Framework for Study of Changes to Tuna Fishing Rights in the Pacific Islands Region



Note. Boxes with black text represent components of the system, brackets and italics represents the equivalent term from the framework presented in Ostrom (2009) and/or Diaz et al. (2015), bullets give specific descriptions for Pacific tuna fisheries, with relevant variables suggested in parentheses where available; Text and arrows in red represent interactions between components in the system, with relevant variables in parentheses where available; Blue ovals represent external drivers of change in the system, bullets give specific descriptions for Pacific tuna fisheries; Green boxes and arrows represent components of the governance sub-system.

The Role of Governance in a Fisheries SES

The conceptual framework of a WCPO tuna fishery shown in Figure 3 is proposed in order to help define the units of analysis for consideration of governance changes in the region's tuna fisheries, and also to illustrate the central role governance plays on the linkages between the different components of the fisheries. To further define the specific units of analysis, the role of governance in the framework in Figure 3 can be described in more detail, and specifically the general components of this concept.

Although governance is a widely used and often vague term, the study of governance itself arose out a number of distinct intellectual communities, one of which was the need to address problems requiring collective action, where the decisions of two or more individuals, each acting rationally in their own self- interest, result in socially undesirable outcomes (Ansell and Torfing, 2016).

Collective action problems have been the focus of a massive literature that spans all social sciences and most biophysical sciences, from Aristotle to Hobbes to Adam Smith among others (Ansell and Torfing, 2016). One of the most widely studied collective action problems (or "social dilemmas") has been the management of common pool resources such as fish stocks, or the "commons problem," where a resource is both (i) subtractable (or rivalrous) and (ii) also inherently hard to exclude access to (Ostrom, 1990; Axelrod and Hamilton, 1981; Ostrom, V. and E. Ostrom, 1977; Gordon, 1954).

In the case of commercial fisheries where profit maximization is considered as the primary goal motivating behavior, the commons problem has long been described as a situation where access to the resource is open and multiple fishers compete to catch fish from a given stock, and each fisher maximizes his/her net income by continuing to fish as long as the economic value of an individual's catch exceeds the cost of catching it (see Box 1 for more detail). Essentially, the commons problem in fisheries can be summarized as the: (i) rivalry or subtractability problem and the need to limit extraction to levels that match desired replenishment, and (ii) the non-excludability problem, where fishers race to catch the next fish, since what one fisher leaves may soon be caught by the next (Birkenbach, Smith and Stefanski, 2019).

Box 1. The Commons Problem in Commercial Fisheries

The emergence of the commons problem for a given commercial fishery may be summarized as follows. When a virgin fish stock is first exploited and access is open, the fishers initially experience high catch rates and high profits. This attracts more fishers to join them and those already in the fishery may commit more or improved gear, vessels or other capital equipment to the fishery. Fishers then tend to intensify their efforts to catch the dwindling stock, i.e., the 'race to fish.' If the catch is greater than the surplus growth of the fish stock, the stock will dwindle until a point is reached when the stock becomes depleted. Catch rates and profits fall to a point where most of the fishers just break even. If further fishing effort is committed to the fishery, it brings about losses and forces some of the fishers to leave the fishery and a break-even point for the fishery as a whole is attained. At this point all the profits potentially available in the fishery have been dissipated (Hilborn et al. 2005). Both natural and human capital have been wasted, and society is worse off even as individuals pursue private interests. Rational individual decisions acting independently led to irrational outcomes for the whole group. Currently, many of the world's fisheries are characterized by the 'race to fish', and given high investment costs in capital, harvesters will often need only to cover the marginal costs of operation in order to stay in business, meaning that the race can continue for some time (see for example Birkenbach et al. 2017; Huang and Smith, 2014; Costello et al. 2008; Beddington et al. 2007; Hilborn et al. 2005; Grafton, 1996).

Definition and Components of Fisheries Governance.

Beginning in the 1980s and 1990s, new institutional economics emerged as a field focusing on institutions as a key solution to the commons problem because of their role in establishing the rules of the game for collective action (North, 1990), such as formal written rules or informal social norms (Ostrom, 2005), that are required for regulating the use of a shared resource like fish stocks. The formation and administration of such institutions is essentially the work of governance, which has been defined as "the process of steering society and the economy through collective action and in accordance with common goals" (Ansell and Torfing, 2016). Essentially, governance institutions can be considered as the filter through which the social components interact with the natural components of a socio-ecological system, in order to regulate human influence and "govern" human behavior (Ostrom, 2009; Lui et al. 2007; Hanna, 1999; Vitousek et al. 1997).

Although no two commons problems are exactly the same, some type of institutional response to regulate access to and use of common pool resources (essentially creating institutions that establish some form of 'boundaries' around access) is considered essential to reversing or mitigating human impacts upon the planet's ecosystems in the face of growing use and technology (MEA, 2005). In the case of addressing the commons problem in commercial

Box 2. Institutions and Organizations for Governance

North (1990) wrote that because creating incentives sufficient to reward cooperation or policing to deter defections are costly, societies have developed institutions to help reduce these costs and achieve collective action to solve commons problems. These institutions represent humanly devised constraints that shape human interaction, i.e., the framework within which human interaction takes place, defining and limiting the set of choices to individuals in that situation (North, 1990). Ostrom (2005) further defined the term as the rules, norms or shared strategies that form the rules of the game in a given situation. Institutions are a central component of the governance framework in SES's.

While governance can be characterized in terms of the institutions, or the rules of the game, it also consists of the organizations emerging from these rules and in turn acting in some cases as agents of change (North, 1990). Organizations are defined as groups of individuals bound by some common purpose to achieve objectives (in contrast to the rules of the game in which organizations play/operate) (North, 1990). Ostrom (2005) notes that many scholars have often confused these two terms, referring to an organizational entity such a branch of a government, a business firm, a political party or a family for example, as institutions. The distinction enables a focus on the institutions or rules, and the organizations that administer them, as separate variables or characteristics of governance.

Essentially, organizations are created by institutions, and as they evolve, in turn can alter those institutions (World Bank, 2003; North, 1990). Organizations have typically been characterized in terms of the functions that they perform, which in the case of fisheries have frequently included: (i) administration of rules (institutions), e.g., addressing the commons problem in fisheries through setting catch limits (Garcia, 2005); (ii) monitoring progress towards achieving the objectives of institutions; and (iii) enforcement of compliance with rules (Cochrane, 2009; Kooiman et al. 2005). The variety of organizations created by states to carry out these functions is large, including scientific institutes, management agencies, fishing committees, maritime chambers, etc., many of which have traditionally been complex and often centralized (Feral, 2009).

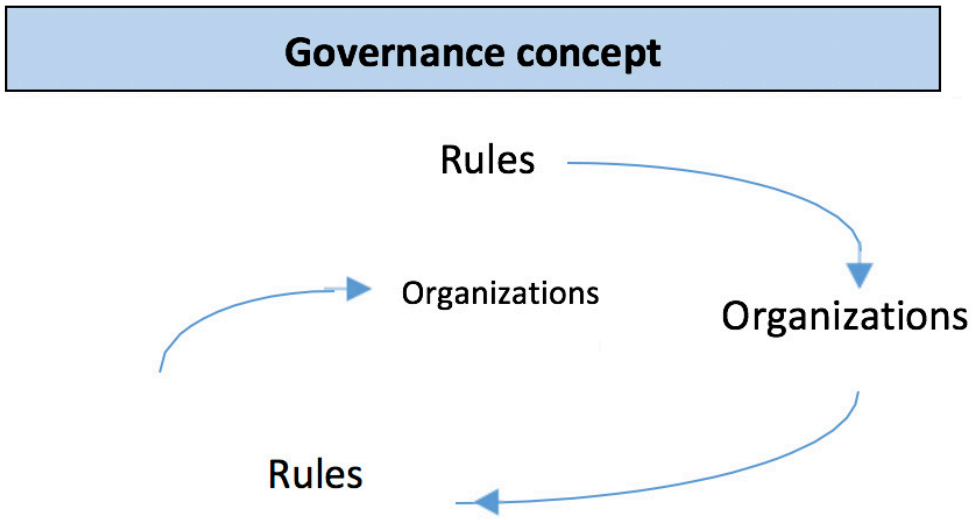
fisheries, through governance institutions, actors are able to cooperate to regulate access and prevent overfishing (Grafton and Squires, 2000).

A key characteristic of governance is the level (i.e., spatial scale) at which they operate and exercise control or jurisdiction (Kooiman and Bavinck, 2013; Kooiman et al. 2005). Institutions and organizations for governance operate at multiple spatial scales, from local (e.g., a village) to national, and from national to international (regional or global). At the international scale, rules take the form of treaties, both multilateral and bilateral, and other non- binding instruments used by states (FAO, 2005).

Governance institutions often occur at multiple spatial scales in fisheries (Hilborn et al. 2005), where one institution is nested within a larger institution, which is

nested within an even larger institution, etc. (World Bank, 2003). For example, strategies expressed by an organization at one level may lead to rules that change another organization(s) operating at a different level – from a national agency down to a village (Ostrom, 1990; World Bank, 2003). For this reason, Ostrom (2005) emphasized that governance institutions are often reflect polycentric systems – where people organize not just one, but multiple, governing authorities at different spatial scales, and each unit exercises considerable independence to make and enforce rules within a circumscribed domain of authority for a specific geographic area.

Figure 4. Illustration of Polycentric Components of the Concept of Governance



Source: Ostrom (2005)

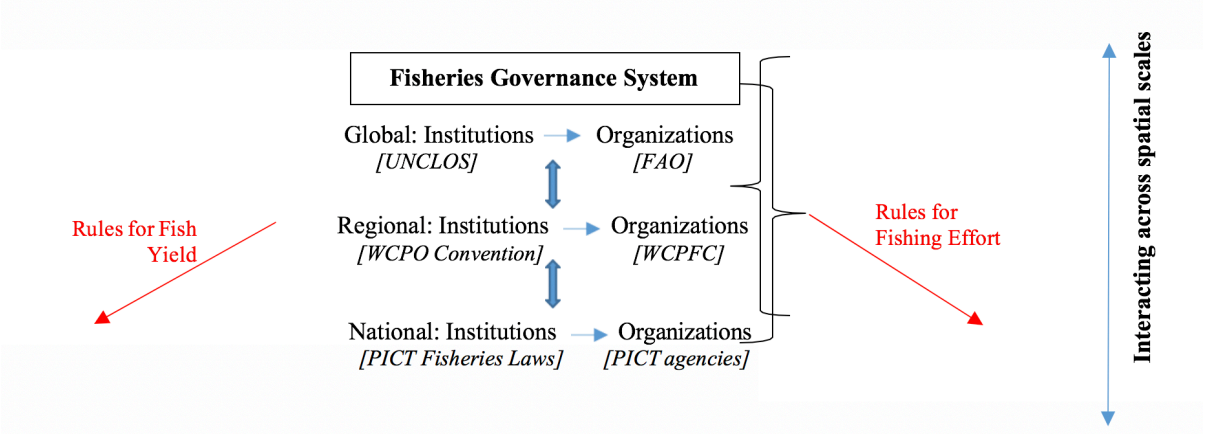
The multiple levels at which governance occurs (Hoeghe and Marks, 2001) has been characterized in a given system by Ostrom (2005, 1990) as: (i) operational rules that directly affect day-to-day decisions made by resource users and can be changed relatively rapidly; (ii) collective choice rules that affect operational activities and results by determining who is eligible to use the resource

and the specific rules to be used in changing operational rules—(essentially how operational rules are made) these change at a much slower pace such as statutes and common laws, and (iii) constitutional choice rules that affect collective choice activities by determining who is eligible to be a resource user and create the rules for creating collective choice rules—these change at the slowest pace (essentially who can make which decisions). These levels are analogous to those that Kooiman et al (2005) describe for governance more broadly as first-order governance (day-to-day); second-order governance (institutions within which first order governance takes place); and third-order or meta-governance (core principles upon which governance in a society takes place).

One of the fundamental challenges in developing or changing institutions to govern the use of common pool resources is the mismatch in spatial scale between the ecological system and decision-making for rules, e.g., the geographic range of a fish stock compared to the jurisdictional scale (Crowder et al. 2008; Wilson, 2006; Young and McColl, 2003). For example, some rules can only be made at the national scale that are necessary for governance at a local scale, and outcomes at a given spatial scale are often heavily influenced by interactions of ecological and social systems at other scales (Crowder et al. 2008). Wilson (2006) notes that it is generally accepted that building robust and effective governance institutions requires a close match with the spatial extent of the ecological system, otherwise for example, decisions and rules may influence only a portion of the ecological system—essentially only partially governing the interaction with the natural system (see for example Young and McColl, 2003; Berkes et al., 1998, Ostrom, 1990).

On this basis, the governance component within the SES conceptual framework given in Figure 3 can be further described in terms of institutions and organizations, given at multiple levels, as shown in Figure 5.

Figure 5. Illustration of the Governance Component of the SES Framework



UNCLOS = United Nations Convention on the Law of the Sea Treaty; WCPFC = Western and Central Pacific Fisheries Commission

Overview of the Current Governance System for Each of the Three Tuna Fisheries, and the Fishing Rights Created.

Following the description of the components of governance at different levels provided in Figure 5, this section provides a brief overview of the current institutions (in this case formal rules) and organizations created to administers them, that regulate tuna fishing effort and catch in the three Pacific tuna fisheries.

At the regional level, based on the framework provided by UNCLOS and UNFSA, all three of the Pacific tuna fisheries under consideration here are governed in part through the institution of the Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean, opened for signature in 2000 and entered into force in 2004.[23] This agreement resulted from six years of complex negotiations between PICTs and distant-water fishing nations, creating a Western and Central Pacific Fisheries Commission as an RFMO to administer the agreement that currently includes 26 member countries, 7 participating territories and 7 cooperating non-members, and covers the entire WCPO (WCPFC, 2015). The RFMO is a forum that takes decisions on the basis of consensus, in order to regulate fishing effort and catch to overcome the commons problem and ensure the long-term conservation and sustainable use of the tuna stocks, among others (WCPFC, 2015). These decisions, known as "conservation and management measures" (CMMs), are binding upon members, and have included for example the requirement that all members' vessels are authorized to fish in the WCPO and have registered with the RFMO's secretariat, as well as to share information on vessels' fishing effort and catch to support decision-making (Gillett, 2014). As shown in Table 3, these rules typically focus on setting objectives for sustainability of the stocks (e.g., CMM 2015-06, CMM 2018-01), setting limits on fishing effort – which recognize the limits set by states within their EEZs – (e.g., CMM 2015-02, CMM 2018-01), setting access requirements (e.g., CMM 2013-04, CMM 2018-06), ensuring monitoring of fishing catch and effort (e.g., CMM 2006-07, CMM 2009-10, CMM 2013-05, CMM 2018-05) and ensuring compliance with the rules (CMM 2006-08, CMM 2010-06, CMM 2014-02, CMM 2017-02).

Table 1. Examples of Rules at the Regional Level Governing Pacific Tuna Fishing Effort and Catch

	Institution	Organization
Regional level	Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean	Western and Central Pacific Fisheries Commission
	Examples of Collective Choice Rules for Tuna Fishing Effort and Catch:	
	2006: Regional observer program (CMM 2006-07)	
	2006: RFMO boarding and inspection procedures (CMM 2006-08)	
	2009: Measures for monitoring purse seine landings to increase catch reporting (CMM 2009-10) 2010: Establishment of a list of vessels fishing illegally (CMM 2010-06)	
	2013: WCPFC record of fishing vessels with unique vessel identifiers (CMM 2013-04) 2013: Measures on daily fish catch and effort reporting (CMM 2013-05)	
	2014: Satellite-based vessel monitoring system (CMM 2014-02)	
	2015: Measure to freeze the number of vessels fishing for South Pacific Albacore (CMM 2015-02)	
	2015: Agreement on a goal (target reference point) for sustainability of the skipjack stock (CMM 2015-06) 2017: Standards for application of the Port State Measures Agreement (CMM 2017-02)	
	2018: Measures setting transitional goals for sustainability of the skipjack, yellowfin and bigeye stocks, and effort limits for the purse seine and tropical longline fisheries, recognizing limits set by states for EEZs (CMM 2018-01)	
	2018: Regional observer program (CMM 2018-05) 2018: Record of fishing vessels (CMM 2018-06)	
	2018: Compliance monitoring scheme (CMM 2018-07)	

Source: WCPFC[24]

At this level, following Schlager and Ostrom (1992) theory of property rights, the RFMO is essentially somewhere between a claimant and a proprietor, being able to authorize access and withdrawal to the highly migratory stock and to take management measures, but perhaps limited in its ability to exclude non-participants (given that members must self-police). Authorizations for access and withdrawal typically take the form of total limits on fishing catch, effort and/or activity at the national or fleet level, for specification by members.

At the subregional level, seven PICTs (and subsequently an eighth, Tuvalu) in the equatorial belt where the highest concentration of purse seine fishing occurs, signed the Nauru Agreement in 1982, to harmonize management of fish stocks shared across their EEZs (PNA, 2010). The PICTs who signed the Agreement, i.e., the Parties to the Nauru Agreement (PNA), agreed to work together to set uniform terms and conditions of access to the tuna in their waters, including licensing, reporting, identification, etc. (World Bank and Nicholas Institute, 2016).

Over the years this cooperation gradually shifted from a focus on public investment to harmonized rules for access and withdrawal in the purse seine fishery, particularly in the period from 2000 to 2006 when the countries explored specifying access and withdrawal rights in terms

of the total number of days fished instead of the total number of vessels licensed (Gillett, 2014). As a result of this exploration, in 2006 the PNA amended the Palau Arrangement[25] in order to create a Vessel Day Scheme (VDS) to regulate purse seine tuna fishing access. Through the VDS, the Parties meet each year to set a total collective limit on purse seine fishing days in their EEZs[26] for the year (the total allowable effort or TAE), based on the best scientific information and advice available, and allocate that TAE among the Parties (the Party allowable effort or PAE) using a formula that combines a measure of EEZ productivity and effort and catch history (Aqorau, 2009).[27] All Parties agree to limit fishing effort authorized in their waters to the respective PAEs, using standard criteria for reporting fishing days, and to sell these days at a minimum price to avoid downward competition between states for users.[28] Similarly, for the tropical longline fishery, the PNA amended the Palau Arrangement in 2014 to establish a VDS for the longline fishing effort they authorize in their EEZs, aiming to enhance "the management of longline fishing vessel effort in the waters of the Parties," under similar terms as the purse seine VDS (World Bank and Nicholas Institute, 2016; PNA, 2015).[29]

To administer the purse seine and subsequently the tropical longline VDS, the PNA initially utilized the Pacific Islands Forum Fishery Agency (FFA), but in 2010 the Parties amended the Agreement to establish the PNA Office (PNAO). The PNAO currently administers the VDS for both fisheries, performing any functions required by the Parties to administer the scheme, including convening meetings of the Parties, maintain a register of vessels eligible to fish in Parties' waters, and supporting monitoring of purse seine fishing days used by each Party as well as fish catch by maintaining the web-based Integrated Fisheries Information Management System (iFIMS).[30]

While the purse seine and tropical longline fisheries are the subject of cooperation by the PNA, the southern albacore fishery is below the equator and includes a different set of actors. Among these actors, in 2014 ten states[31] signed the Tokelau Arrangement to cooperate for shared management of the albacore fishery occurring in the waters, by introducing fish catch limits on albacore by EEZ, following loosely on the model of the VDS, whereby limits on access for the fishery would be introduced via national rules in each of the participating countries (Havice et al. 2014).[32] The approach was similar to a "cap and trade scheme" and more specifically the VDS, except that withdrawal rights for users would be specified in terms of catch, rather than fishing effort (i.e., fishing days).[33]

The Parties asked the Pacific Islands Forum Fisheries Agency (FFA) to administer the Tokelau Arrangement,

Box 3. Spatial Mismatches between Governance and Ecosystems

As mentioned previously, spatial mismatches between the scales of governance and ecosystems are common (Crowder et al. 2008). Of note, for all three highly migratory tuna fisheries, the only level at which there is a match is at the regional level, with the RFMO (which has a relatively weaker claim on the resource). At the sub- regional level, the match is incomplete, e.g. members of the PNA collectively have jurisdiction over roughly three quarters of the purse seine harvest taken in 2015, but only some 30 percent of the tropical longline harvest that same year (World Bank and Nicholas Institute, 2016). In both cases, but particularly the tropical longline fishery, the relatively small portion of the space in which the fishery occurs that is under the jurisdiction of the VDS, means that leakage of fishing effort from highly mobile distant water fleets may be likely.

and support the states to meet at least once annually in order to take decisions by consensus (World Bank and Nicholas Institute, 2016). The organization was established by treaty[34] in 1979, as a result of the perception from PICTs in the late 1970s that many distant water fishing nations negotiated access agreements bi-laterally in a strategy of "divide and conquer" (Gillett, 2014). In an effort to drive regional cooperation to manage shared tuna resources, the treaty created FFA, under the governance of a committee of representatives from member countries (FFA, 2015b). The organization currently aims to advise PICTs on tuna fisheries policy, as well as to provide services where economies of scale can be captured, e.g., monitoring and surveillance to enforce compliance, by maintaining a satellite-based fishing vessel monitoring system whereby all vessels are required to transmit their position by satellite at least every four hours (FFA, 2015b).

Table 2. Examples of Rules at the Subregional Level Governing Pacific Tuna Fishing Effort

	Purse Seine Fishery and Tropical Longline Fishery	
	Institution	**Organization**
Sub-regional level	South Pacific Forum Fisheries Agency Convention (1979)	Forum Fisheries Agency
	Nauru Agreement Concerning Cooperation in the Management of Fisheries of Common Interest (1982)	Annual meeting of the Parties
	Palau Arrangement for the Management of the Western Pacific Fishery (As amended 2010, 2014, 2016)	PNA Office
	Examples of Collective Choice Rules for Tuna Fishing Effort:	
	Purse seine fishery VDS: Parties agree to a "cap" on total fishing effort (TAE), and then use an agreed formula to allocate the cap amongst the members (PAE), who then issue access and withdrawal rights in the form of fishing fishing days to individual users, following agreed regional standards for reporting and minimum price.	
	Tropical longline fishery VDS: Follows the same basic parameters as the purse seine VDS.	
	Southern Albacore Fishery	
	Institution	**Organization**
	Tokelau Arrangement (2014)	Forum Fisheries Agency
	Examples of Collective Choice Rules for Tuna Fishing Catch: Catch management scheme not yet developed.	

Sources: PNAO, FFA

At the subregional level, the PNA essentially functions as a proprietor on behalf of its members, setting rules for access and withdrawal of tuna from the waters collectively under its jurisdiction, as well as having the right to manage and exclude. In the case of the purse seine and tropical longline VDS, the access and withdrawal authorizations are specified in a total number of fishing days (PAE) that can be issued by each member.

At the national level, states issue the authorizations to access and withdraw tuna from the waters within their EEZs directly to individual users, via licenses with minimum fees collected as

taxes and a number of duties or requirements (e.g., to report catch, avoid by-catch, etc.). For the purse seine and tropical longline fisheries, the states are issuing these authorizations as part of the subregional VDS, setting a total cap on fishing effort at subregional and national levels, and issuing portions of that cap to individual users in the form of fishing days. Generally, there are a range of ways that rules specify fishing effort limits, e.g., technical measures (gear restrictions), input controls (e.g., through licensing), output controls (e.g., a total allowable catch), or portions of a total cap, e.g., effort quotas (Charles, 2009). On this basis, the rules created under the VDS for the two fisheries can be characterized here as individual effort (IE) regimes in each PICT, from the perspective of the resource users, rather than individual quota (IQ) for example.

Theoretically, such effort rights create weaker economic incentives for users to overcome the commons problem than catch rights, since these rights can be expected to lead to increases in effective effort—a measure of the actual effect of fishing on the stocks (e.g., fishing mortality)—as they gravitate towards more efficient vessels (Squires et al. 2017). However, in some cases the costs of monitoring compliance with the rules may be much lower for an effort-based regime than one based on quotas, e.g., nominal units of effort may be cheaper to monitor than catch (Squires et al. 2017). Hence, effort-based regimes may be more appropriate for some fisheries than a system that authorizes the resource user to a portion of the catch, depending upon the relative size of the transaction costs (e.g., monitoring and enforcement of compliance) and the residual inefficiencies (Townsend et al. 2008).

In terms of the fishing rights created at the national level, as a result of UNCLOS, states are the only entities that have all five types of property rights in the bundle described by Schlager and Ostrom (1992), functioning as resource owner. Hence, in the governance of Pacific tuna fisheries (from the systems perspective of a SES framework), the only formal entity with the characteristics of resource ownership are PICTs. They hold the strongest property right for tuna fishing within the system, as the only entity with all the characteristics of property equivalent to resource owner. Of course while much literature and practice focus on property relations in EEZs (Shotton, 2005), property rights have existed in traditional fishing communities long before UNCLOS (Cordell, 1989), including in Pacific Island communities where common property over defined resources was exercised and use rights allocated within the group of eligible users, and/or technical measures fixed (Johannes, 1978; Ruddle, 1988).

Table 3. Summary of Rules at the National Level Governing Pacific Tuna Fishing Effort and Catch

National level	**Purse Seine Fishery and Tropical Longline Fishery**	
	Institution	**Organization**
	PICTs (State)	National fisheries agency
	Examples of Collective Choice Rules for Tuna Fishing Effort:	
	IE regime: rules specify individual units of fishing effort authorized for resource users, in terms of fishing days, as a portion of the PAE for each state, and collectively within the TAE.	
	Southern Albacore Fishery	
	Institution	**Organization**
	PICTs (State)	National fisheries agency
	Examples of Collective Choice Rules for Tuna Fishing Catch:	
	Individual quota (IQ) regime proposed, where rules specify individual units of fish catch authorized for withdrawal by resource users, as a portion of a TAC.	

ANNEX II. DETAILED DESCRIPTION OF THE METHODS USED IN THE CASE STUDIES

In the absence of company-level catch and effort data (or "operational-level data"), we estimated average purse seine catch and fishing effort in each of the PICTs based on publicly available catch and effort data from WCPFC from 2004–2017. Using the "union" tool in ArcGIS, we created shapefiles of the WCPFC catch blocks and EEZs (Figure E1). The catch recorded in a block was then attributed to each PICT via the proportion of their EEZ contained in that block, recognizing this assumes a somewhat homogeneous distribution of catch throughout a block, which is unlikely. The total number of fishing days used by each flag state was summed to generate catch by EEZ and catch by species. From these values, CPUE by vessel day was calculated to determine overall catch by species for each flag fleet. Because of these methods which use aggregate and averaged data to determine vessel-level statistics, we are unable to accurately capture the impacts of day-level fluctuations in efficiency and demand. While our estimates are grounded in known fishing behavior and catch records, we cannot completely account for the relationship between fishing activity and the anticipated downward sloping demand curve in this fishery due to fluctuations in supply and fishing efficiency.

The WCPFC Register of Fishing Vessels was used to estimate the relative number of purse seine vessels operated by each flag state. Unfortunately, the register only covers those vessels fishing in two or more EEZs or on the high seas, which means we are not accounting for roughly 20% of the purse seine fleet. Vessel lengths were standardized and placed into one of the size categories[35] <50m, 50-80m, and >80m. This facilitated estimating size-dependent costs. Since the Japanese purse seine fleet does not disclose vessel statistics, we assumed the entirety of the Japanese purse seine fleet is 50-80m vessels, which is the most common size class and the most efficient/profitable in the fishery.

Revenues and costs for each flagged fleet were based on the market value of catch (based on current Bangkok (BKK) market prices), fuel expenses, crew salaries, and the depreciation cost of a vessel. Based on differences in vessel lifespan, we assumed two main classes of vessels to calculate depreciation with: Chinese/Taiwanese built vessels and European (primarily Spanish) built vessels. Discussions with the World Tuna Purse Seine Organization (WTPO) and other commercial stakeholders, we estimated that fleets will be willing to pay between 10 and 30 % of their total revenue per fishing day for an additional fishing day depending on the level of catch rates and BKK market prices. This is distinct from the probability a fleet will purchase another fishing day, which is related to available capacity in the fleet. Again, these estimates are coarse given data limitations and generated for indicative purposes. Ideally estimates would be based on operational-level data to support a more thorough analysis of willingness to pay (e.g., using a Monte Carlo risk analysis, or as an interim step a sensitivity analysis of different probability values for buying and selling fishing days).

Instead of focusing on the potential implications of a secondary market for one or two PICTs, we used patterns in annual catch and characteristics of the primary fleets fishing in each EEZ to group PICTs likely to have similar fleet behavior dynamics. PICTs fell into three bins: high productivity (high catch and purse seine effort); low productivity (low catch and purse seine

effort) and mid-level productivity EEZs; for the purpose of illustrating the range of potential benefits we created archetypal country profiles based on historically high and low productivity PICTs. The high productivity country in our model includes characteristics similar to Federated States of Micronesia, Kiribati, and Papua New Guinea. The lower productivity country and has traits most similar to the Marshall Islands and Tuvalu. The number of fishing days each flag state would be expected to purchase from each of these hypothetical PICTs was estimated by summing total catch and dividing that by the flag state's average CPUE in each country in lieu of vessel-level fishing day use data (i.e., operational-level data).

We quantified each flag state's probability to purchase in the secondary market as a function of available capacity in the form of additional fishing days sought in the secondary market. This is represented as a percentage of vessel day use by each flag state in the country varying between 0 and 20%. The probability ratios were based on knowledge from previous work on fleet efficiency and performance. In addition, we quantified each flag state's probability to sell their fishing days in the secondary market as a percentage of vessel day use between 0 and 10% of current capacity. Whilst the probability ratios were used deterministically, they are most likely to be dynamic in nature and change considerably year to year based on several factors such as: vessel maintenance, inclement weather, and average revenue per vessel day.

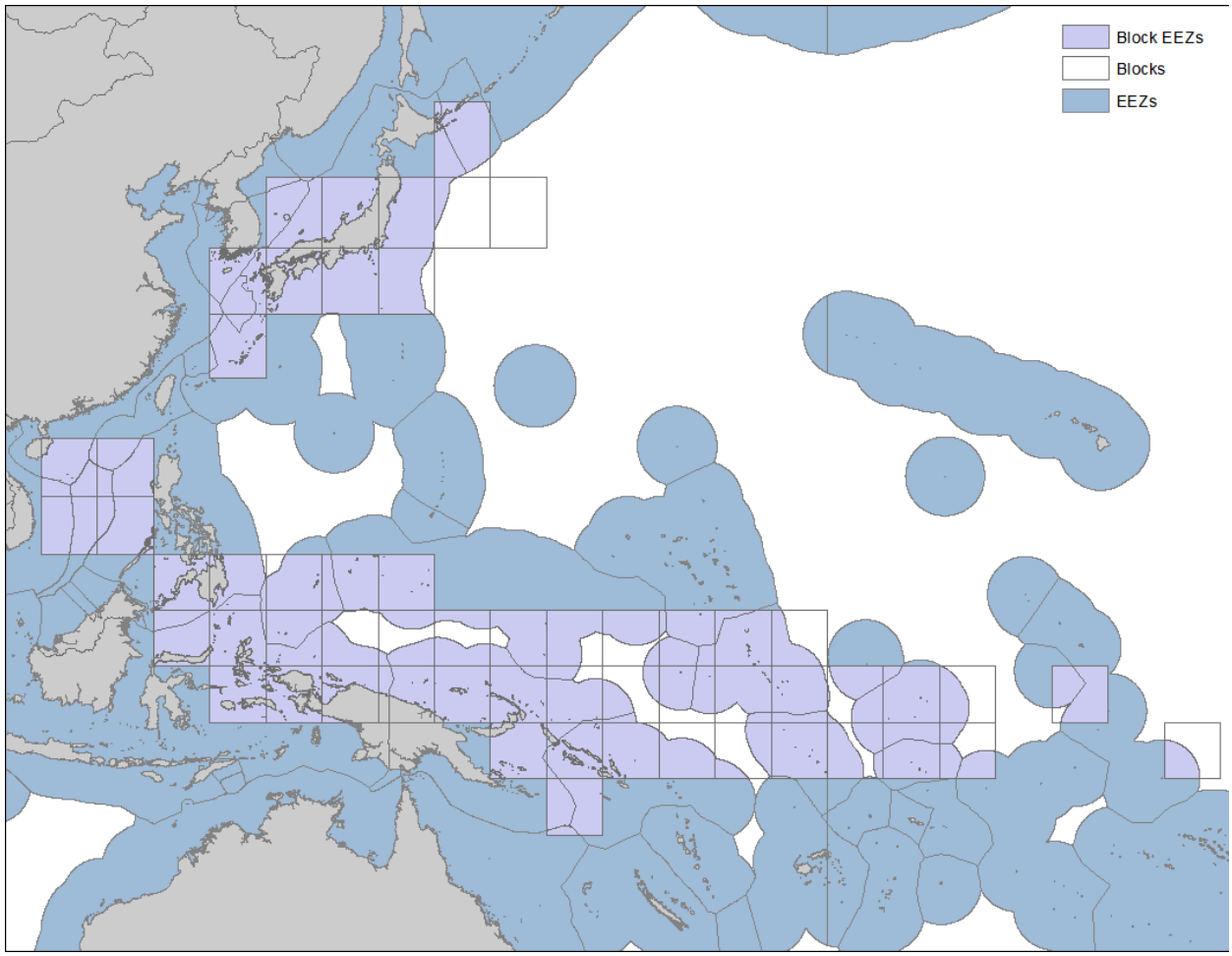
Based off previous work on the VDS, we also assumed it was unlikely for flag states to sell large portions of their purchased fishing days except for extreme and infrequent mitigating scenarios, though operational-level data was not available to conduct a more robust analysis to estimate probabilities for willingness to sell at different prices. Most companies would be purchasing in the secondary market to 'top up' existing fishing plans. We set the probability ratio to sell, at a lower rate than the probability to purchase. Each flag state's willingness to sell in the secondary market creates an opportunity for fishing days to be sold (i.e., supply of days), which aggregate to a total number of fishing days available (i.e., industry supply curve). Flag states purchase additional fishing days in the secondary market according to their willingness to pay the value of a vessel day. Therefore flag states with low fishing day values (due to their lower catch rates) may not be able to participate in the secondary market if the number of fishing days available in the market is less than the number of total fishing days sought, as flag states with higher fishing day values will outcompete them in the market.

Estimating Catch and Effort in Each PICT

Using publicly available catch and effort data from WCPFC (2004–2017) we determined catch rates for each PICT EEZ (addressing variability across ENSO events through different scenarios). WCPFC catch data was aggregated by the flag of the vessel, organized by species, number of days, and sets (note that in the absence of operational-level data, no distinction was made in the model of the secondary market). Data was reported in catch blocks of 5 degrees by 5 degrees—approximately 550 sq km (Figure 1). Using union tool in ArcGIS we created shapefiles of the blocks and EEZs. Because some catch blocks include areas of land and margins of EEZs, the shapefile of PICT EEZs, was used to calculate the percentage of each catch block area in a given EEZ. The area of overlapping shapefiles was compared to the area of the block (less block area on land). The catch recorded in a block was then attributed to each EEZ via the proportion of the

EEZ contained in each block. This method **assumed a somewhat homogeneous distribution of catch throughout a block,** which we understand is unrealistic. However, without a finer scale of resolution, this was the best estimate of catch in each EEZ (by flag state) available for use in the study. Due to a lack of available data on the financial tradeoffs of FAD (fish aggregating device) and non-FAD sets, we did not consider these types of fishing days as distinct in this study.

Figure 1. Map of the Pacific Islands region with the WCPFC catch blocks and EEZs.



Note. EEZs that overlap with catch blocks, and thus receive a partial allocation of the catch recorded in that block, are highlighted in purple.

Understanding Catch and Effort for DWFNs

Average WCPFC catch block data from 2004 to 2017 was used to estimate current fishing patterns for the different flag fleets in each PICT EEZ. The total number of fishing days used by each flag state was summed by EEZ and catch by flag state for each PICT EEZ was then summed to generate: (i) catch by EEZ; (ii) catch by flag fleet; and (iii) catch by species. From these values, CPUE by vessel day was calculated to determine overall catch by species for each flag fleet. **We**

assumed that historical WCPFC estimates of CPUE was accurate enough to model the purse seine fleet behavior operating in each PICT EEZ. This extended timeframe allows us to model the upper and lower bounds of profitability in the fishery within average variation of the fishery conditions (including technological change).

The proportion of the total catch in each EEZ attributed to each flag state determined the 'major fleets' for each EEZ. For this study we assumed that **DWFN's with 10% or more of their catch in a given EEZ was a 'major fleet' for that PICT.** *The model only included completed fleet profiles for the DWFN fleet that were identified as 'major fleets. The data for all fleets is however, available in the data tabs of the model (see country data tabs in the model).* Catch from PICT-flagged vessels was aggregated and not included in "major fleet" determinations.

Creating Case Studies/Hypothetical PICTs

Total annual catch and major fleet characteristics were used to group comparable PICTs. PICT EEZs fell into two bins: County A is a historically high productivity country, with characteristics similar to Federated States of Micronesia, Kiribati, and Papua New Guinea. Country B has lower productivity with traits similar to the Marshall Islands and Tuvalu. These two hypothetical PICTs can also represent the ENSO variation within one PICT over time, as the productivity in any one PICT can vary significantly due to oceanic conditions.

Estimating Costs and Revenues of DWFN Fleets

Number and Size of Fishing Vessels

The WCPFC Register of Fishing Vessels was used to estimate the total number of purse seine vessels operating by each flag state. Note, this register only covers vessels that fish in two or more EEZs, which meant we were missing approximately 20% of the purse seine fleet. Purse seine vessel lengths were standardized (**registered length = 96% of reported length overall**)[36] and all measurements were converted to meters. Vessels were then placed into one of the following size categories: <50m, 50-80m, or >80m. For each flag state, we determine the proportion of their fleet that fell into each of the three size classes. Because the Japanese fleet does not disclose vessel statistics, **we assumed the entirety of the Japanese purse seine fleet to be 50–80m class vessels**. We based this assumption on the fact that this was the most common size class in the fishery and also the most economically efficient vessel category.

Depreciation of Vessels

We assumed there are two main classes of vessels to calculate depreciation: Chinese/ Taiwanese built vessels and European (primarily Spanish) built vessels. This assumption was based on differences in the cost and lifespan of these vessels sourced from the WTPO and conversations with fleet owners. *(Where flag fleets were sourcing their vessels was captured in the "Purchase Chi/Tai" and "Euro" variables y in the model.)* The depreciation cost of a vessel day was defined as:

$$\text{Depreciation cost of a vessel day} = \frac{\text{annual depreciation}}{\text{average number of vessel days used per vessel per year}}$$

$$\text{Annual depreciation} = \frac{\text{value of new vessel - salvage value of that vessel}}{\text{the average vessel lifespan}}$$

Market Value of Catch

Market value for three tuna species, skipjack, bigeye and yellowfin tuna were sourced from current Bangkok market prices. Thai Union reports the raw whole Skipjack prices in Bangkok: https://investor.thaiunion.com/raw_material.html. General industry knowledge was used to supplement the price differential for Yellowfin and Bigeye

Crew Salaries

Vessels generally have four high salaried crew members (i.e., fishing mate, boat captain, and engineers), that will also include payment of a fishing bonus. The rest of the crew are usually paid a moderate wage and a bonus based on the catch (and thus revenue) of the vessel. These individuals were modeled as 'non- salaried crew' and their pay was calculated as the dollar value * metric ton catch. Average crew numbers per vessel size were deemed redundant for this part of the model as the variation in catch will reflect vessel size differences. The per mt value across all crew can have a large range across companies and fleets, however for modelling purposes we used a range from **$145–$175 per mt catch (typical for many domestic vessels) averaged across the timeframe of the study.**

Other Costs

The operational, freight, and repair costs were estimated as a percentage of revenue. This percent was based off experienced knowledge of the fleet and fishery. Fuel costs were estimated from an average of **$550/kl** of fuel and **average fuel consumption per fishing day by vessel size**. *See Costs & Revenue section (C & R) of Model for further info.*

Determining Willingness to Pay

We did not have any survey or known willingness to pay price data. Using best available information assumptions were made on the percentage of average revenue per day a fleet would be willing to pay. **Using knowledge of previous work in this area, we estimated that the fleet would be willing to pay between 10 and 15% of their total revenue per vessel day for an additional vessel day (some companies may pay as much as 30%, though this results in vessel-level losses).** *This is distinct from the probability a fleet will purchase another vessel day, which is related to available capacity in the fleet.* Some companies make more money processing and canning tuna than catching it. The companies paying top dollar for a fishing day are generally those that are vertically integrated. The companies that only operate fishing vessels cannot hedge their operations when the Bangkok market prices are low without relying on previous high profitability years. We recommend modeling the vertical integration of key companies as a next step to the PICTs, as well as more thorough analysis of a willingness to pay using more accurate data (such as a Monte Carlo risk analysis).

Tying It All Together

The total annual catch of each flag state by species was calculated using the average annual catch in each PICT EEZ * proportion of the PICTs catch assigned to each flag state * proportion of that flag state's catch of each species. CPUE in each EEZ by flag state, was incorporated into Country A and Country B CPUEs for the high and low productivity PICTs, respectively. We also estimated the percentage of each species making up the total tuna catch in hypothetical Country A and B.

The number of fishing days each flag state purchased from country A and Country B was estimated from historic records of the total catch and the flag state's average CPUE in country A and B, respectively. The number of purse seine vessels each flag state would operate in Country A and B, was estimated using the fleet's total annual fishing days and the average number of fishing days purchased per vessel (the average number of days purchased was set at 200). *This was only used to estimate the weighted average of vessel costs (per vessel size class) and should not be taken as absolute.* The total revenue of each flag state was estimated using the catch of each species * the average market value price of each species in 2019. The revenue and the number of fishing days was used to estimate the total revenue per vessel day.

The costs per vessel day were estimated as follows: (i) the size-dependent costs per vessel day was estimated for each of the three vessel size classes; (ii) the proportion of vessels in each class that make up a given fleet were used to estimate the weighted average cost per vessel day for each flag state; and (iii) crew costs was calculated as a standard salary per vessel day and the catch-based pay for the remaining crew.

The depreciation per vessel day, was estimated using purchase value in each vessel market (i.e., European or Chinese/Taiwanese). Net revenue per vessel day (by flag state) was used to determine if fleets were operating at a vessel-level loss. Willingness to Pay per vessel day was calculated using the WTP variable * the total revenue per vessel day.

Probability to sell was set between an expected range (0–0.1) based on industry knowledge and likelihoods determined by net revenue per fishing day for each fleet, assuming that fleets would not excessively purchase in the primary market and so the number of fishing days needed to be sold on the secondary market would be limited. Probability to buy was set between an expected range (0 - 0.2) also based on industry knowledge of fleet efficiency/capacity and the net revenue per fishing day for each fleet. These values were kept dynamic to create different hypothetical scenarios in the secondary market. Note a Monte Carlo risk analysis was not used for these scenarios, in the absence of operational=level data. The number of fishing days each flag state made available in the secondary market was estimated using the fleet's annual fishing days multiplied by their sell probability. These values were summed across all fleets to reflect the total number of days in the secondary market.

The number of fishing days a flag state would be willing to purchase from the secondary market was calculated using each fleet's annual fishing days * their probability of purchase. The potential purchase value for each fleet was estimated using the number of fishing days purchased in the secondary market * their maximum willingness to pay value per vessel day. The purchase value for each fleet fishing in Country A and B was used to estimate the total value of the secondary market in each country. The total value of the secondary market is reflective of the total profits earned by countries selling their fishing days in the secondary market. This is not a net profit as it does not account for the initial vessel day purchase price. Note - this analysis did not propose a mechanism that would allow the PICTs to capture some or all of the value of the secondary market which otherwise stays among the fishing fleets.

ANNEX III. PACIFIC ISLAND COUNTRY AND TERRITORY LEGISLATION REVIEWED

FFA Member: Cook Islands

Legislation: Marine Resources Bill 2016 (to replace Marine Resources Act 2005)

Source: Ministry of Marine Resources

Currency: Bill is still before Parliament as at 18 Feb 2019

Instruments:

- Licence;
- Fishing licence;
- Distant water fishing licence;
- Authorisation
- Fishing right
- Permit
- Quota
- Quota Management System
- Fishery allocations (under access agreements)
- Licences for a class of fisher, fishing gear or other equipment or device (including FADs)
- Rights o aggregated fish

Licence-related provisions:

- s3 defines licence, distant water fishing licence, fishing licence, Cook Islands fishing vessel, foreign fishing vessel;
- s29: Fishery Management Plans to be developed for designated fisheries (s28). FMPs may include provisions for a Quota Management System and "additional matters";
- s31(5): FMPs valid for up to 5 years and may be renewed for a max of an additional 5 years;
- s36: Minister may enter into access agreement and fisheries management agreements or treaties providing for, inter alia, fisheries access;
- s38: Fishery allocations may be made under an access agreement;
- s39: Access agreement may provide for, inter alia, authorisation of fishing, issuing of licences for fishing; and s40 may provide for harmonised terms and conditions for access, standard licence conditions;
- s41: Power to declare a stock subject to a QMS;
- s45: Persons who hold a valid licence under the Act for one or more vessels that entitles the holder to take for sale any fish of that stock in

the fishery waters is eligible for an initial allocation of QMS stock;

- s46: Crown has exclusive ownership in all QMS stocks until allocated under a fishery plan and regs, s46(b) does not have to offer quota to any person;
- s47(1): Quota may be withheld if licence or authorisation is suspended;
- s48: Regulations power (1), including to (b) facilitate of provide for allocation of quota;
- s49: Quota Register to be maintained
- s50: Re issuing of licences for Cook Islands fishing vessels and Foreign Fishing Vessels, including grounds for refusal;
- s52: Requirement for all vessels >10m to hold a licence for fishing or related activities in CI fishery waters;
- s53: Power to prescribe licence conditions;
- s55: Licences valid for up to 12months and not longer than an applicable access agreement;
- s56: Cancellation or suspension of licences;
- s58: Licence register to be established;
- s63(1)(c): Cook Islands Fishing Vessels require a licence to fish on the high seas;
- s64: Owner, charterer or operator of a CI fishing vessel may apply for a distant water fishing licence;
- s65: Ground for refusal to issue a DWF licence;
- s66: Re conditions on DWF licence; and s67: conditions may be varied;
- s68: DWF licence valid for 1 year unless otherwise specified;
- s69: Grounds for cancellation or suspension of DWF licence;
- s70(1)(a): Cook Islands fishing vessels required to hold a licence to fish in other States' waters or on the high seas (DWF licence);
- s71: Power to impose conditions on fishing beyond the CI EEZ;
- s157: Right of appeal against, inter alia, refusal to issue, renew, cancel or suspend a licence or a decision in relation to allocation, adjustment, cancellation of an authorisation, licence or permit;
- s167: Regulations power, including in relation to (2)(a) measures for licensing; (d) (i) providing for the licensing, control and use of FADs and rights to aggregated fish; (f) (i) any matter related to the licensing of vessels; (ii) "any fisherman, class of fisherman, fishing gear and other equipment or devices used for fishing"; (xi) implementation of an access agreement

Transfer provisions:

- s46(2): (a) Crown may sell, lease, or purchase any quota in any QMS stock

Notes:

- s3 excludes from the definition of property any fishing right or allocation under the Act;
- s166: transition provisions including in relation to licences issued under the current 2005 Act;
- Often presumes licences are issued to person but s167(2)(f) refers to licensing of vessels;

FFA Member: Federated States of Micronesia (FSM)

Legislation: Marine Resources Act 2002 (Revised Code 2014)

Source: PACLII. Also available at http://www.fsmlaw.org/fsm/code/index-code2014.html#t24 **Currency:** Current as at 2014 but there may have been amendments subsequently. No more recent editions at PACLII and difficult to find more recent consolidated Code at fsmlaw website.

Instruments:

- Permit;
- Regional access licence;
- Permit for related activities;
- Participatory rights, such as allocations

Licence-related provisions:

- s103: All domestic fishing, commercial pilot fishing, foreign fishing or such other fishing or related activity as may be prescribed in the EEZ requires either (1) a permit issued under authority conferred by this sub-title; (2) licence issued by an administrator under a multilateral access agreement (i.e., regional access licence);
- s104: All marine scientific research, training or foreign recreational fishing in EEZ requires a permit;
- s105(1): Foreign fishing vessels to fish under an applicable access agreement;
- s105(2): Power to enter into access agreements;
- s106(1): Power to enter into fisheries management agreements, which may inter alia (a) authorise a person, body or organisation to allocate, issue and deny fishing licences valid in the region or part thereof, including the EEZ;
- s106(a) Power to exempt foreign fishing vessel from a requirement of this subtitle which is inconsistent with the terms of a MAA or FMA, and (d) prescribe conditions for such exempt vessels;
- s109: Grounds to refuse to issue or renew a permit;
- s110(1): Permits only valid for species, type of fishing gear or method of fishing or such other activity in accordance with this subtitle may be specified in the permit;
- s111: Grounds for suspension, revocation or imposition of conditions or restrictions on a

permit;

- s112(1): Permits valid for max 1 year and no longer than applicable charter agreement or access agreement;
- s112(2): Permits automatically terminate if local fishing vessel becomes a foreign fishing vessel;
- s117: Power to require a permit by regulation for "related activities" in the EEZ and by a foreign fishing vessel in the territorial sea or internal waters;
- s118: An FSM State may delegate to the Authority its authority to issue a permit for fishing in the territorial sea or internal waters;
- s204: Power to adopt regulations; (2) regs have full force of the law;
- s205(2): power to negotiate, conclude and implement access agreements and FMAs, (3) issue fishing permits, (4) issue permits on behalf of a FSM State; (5) regulate related activities
- s301: Power to require each flag fishing vessel (ie: local and foreign vessels registered in FSM) to hold a permit to fish on the high seas or in areas in which foreign nations claim sovereignty or sovereign rights, under such terms and conditions as may be prescribed by reg or otherwise;
- s303(1)(a): Flag fishing vessels fishing on the high seas to comply with applicable laws, agreements and permit terms;
- s303(2): Duty to establish a record of vessels authorised to fish on the high seas;
- s303(4): Power to take further measures to implement any fisheries management agreement in respect of flag fishing vessels as may be necessary;
- s404: Minimum terms in access agreements to include (1) foreign party to recognise the sovereign rights and exclusive fisheries management authority of FSM in the EEZ; (2): requirement to comply with applicable access agreement, permit conditions, this subtitle, all regs, all laws;
- s406: Access agreements validity max 10 years, renewable taking into account certain conditions;
- s502(6): Power to determine participatory rights, such as allocations of allowable catch or levels of fishing effort, and (b) may include restrictions as to vessel type, gear type, seasons of operations, areas where fishing can take place and any other restrictions relevant to fisheries conservation and management;
- s502(7): Power to cooperate with states whose vessels fish for highly migratory stocks on the high seas;
- s503: duty to allocate among domestic vessels that portion of total allowable catch allocated to domestic vessels, if unrestricted fishing would exceed optimal sustainable yield;
- s504: power to allocate to foreign parties total allowable foreign fishing;
- s907: Duty to hold a permit to use a fishing vessel for or engage in commercial or non- commercial fishing or related activities in the

EEZ as per s103, s104 or s117

Transfer provisions:

- No explicit provisions on transfers.
- Regulations power appears to provide scope to provide for transfers

Notes:

- Permits appear to attach to a vessel
- FSM States have authority to issue permits for fishing in the territorial sea and internal waters

FFA Member: Fiji

Legislation:

- Fisheries Act 1942 (Cap 158)
- Fisheries Regulations (Contained in Section 9 of the Fisheries Act 1942)
- Marine Spaces Act 1977
- Offshore Fisheries Management Decree 2012
- Offshore Fisheries Management Amendment Decree 2014
- Offshore Fisheries Management Regulations 2014

Source: PACLII and Ministry of Fisheries

Currency:

Fisheries Act:

- Amended in 1991. No apparent amendments since 1991 Fisheries Regs:
- Last amended in 1991 Marine Spaces Act
- No apparent amendments since 1978. Offshore Fisheries Decree:
- Amended in 2014. No other amendments apparent since 2014 Offshore Fisheries Management Regulations 2014:
- No apparent additional regulations since 2014

Instruments:

Fisheries Act

- Licence to take fish;
- Permit (to fish in an area subject to customary rights) Fisheries Reg:
  - Licence to take fish;
  - Permit (to fish in an area subject to customary rights);
  - Offshore licence Marine Spaces Act
  - Licence (for foreign fishing vessels) Offshore Fisheries Decree:
    - Allocation;
    - Authorisation;
    - Fishing licence;
    - Licence;
    - Limitation of effort;
    - Statutory fishing rights;
    - FAD licence;
    - Rights to aggregated fish

Offshore Fisheries Management Regulations 2014

- Licence;
- Authorisation (to fish beyond Fiji fishery waters);
- Permit

Licence-related provisions:

Fisheries Act

- s5(1). "A licensing officer may in his discretion grant licences to take fish in Fiji fisheries waters."
- s5(2). Licences explore on 31 December, personal to the holder, not transferable, subject to conditions as the licensing officer sees fit.
- S5(3). Requirement to hold a licence to take fish for trade - "No person shall take fish in Fiji fisheries waters by way of trade or business or as an employee of a person carrying on the trade or business of a fisherman unless such person is authorised by a licence to take fish provided that

(a) a person who takes fish with a line from the shore or with a spear shall not be required to obtain such a licence; (b) the Minister may by regulation exempt any person from the necessity of possessing such a licence."

- s5(4). persons using foreign registered vessels require Ministerial approval

to obtain a licence: "Subject to the provisions of subsection (2) of section 12 of the Marine Spaces Act, no licence to take fish in Fiji fisheries waters shall be granted to any person owning, operating or manning any fishing vessel registered elsewhere than Fiji without the prior approval of the Minister."

- s6(1): Requirement that all licensed fishermen register any vessel they own or operate.
- s8: "A licence to take fish may be cancelled by the court upon the conviction of the holder for any contravention of the terms of his licence or for any breach of the provisions of this Act or of the regulations made thereunder".
- s9 Power to make regulations inter alia "(e) regulating the procedure relating to the issue of and cancellation of licences and the registration of fishing boats and prescribing the forms of applications and licences therefore and the conditions to be attached thereto"; and "(g) regulating any other matter relating to the conservation, protection and maintenance of a stock of fish which may be deemed requisite".
- s10: Offence to (1) take or attempt to take fish without a licence; (2)(a) not comply with licence conditions; (3) use a foreign fishing vessel in the fishery waters without prior ministerial approval or a licence issued under s14 of the Marine Spaces Act;
- s13. Provisions to protect native customary fishing rights: (1): Prohibited to take fish "in any area in respect of which the rights of any mataqali or other division or subdivision of the Fijian people have been registered by the Native Fisheries Commission in the Register of Native Customary Fishing Rights, unless a member of "such mataqali, division or subdivision of the Fijian people who does not require a licence under section 5 to take such fish or shall first have obtained a permit to do so..."; (2) power to issue a permit at Commissioner's discretion in consultation with Fisheries Officer and the relevant subdivision.
- s14: Power to appoint a Native Fisheries Commission;
- s19: Power of the Commission to maintain a Register of Native Customary Fishing Rights

Fisheries Regs

- s4A(1): "A fishing licence issued under Section 5 of the Fisheries Act shall not permit the licence holder to kill or take any species listed in the Seventh Schedule outside the limit of Internal Waters as defined by the Marine Spaces Act unless the Fiji fishing vessel which he is operating shall have on board an offshore licence pertaining to the fishery category under which that species is listed";
- s4A(2): Power of a licensing officer to "grant offshore licences for each fishery category listed in the Seventh Schedule in the form described by the Ninth Schedule";
- s4A(3): "If any single Fiji fishing vessel intends to fish for several species listed under more than one fishery category described by the Seventh Schedule a separate offshore licence must be obtained for each relevant category";
- s4A(4): "Every offshore licence granted under this regulation shall be

specific to a single Fiji fishing vessel, shall not be transferable to another vessel and shall have no monetary value";

- s4A(5): Offshore licences expire on 31 December;
- s4B(1): Power to determine TAC and allocate quota to licence holders - "The Minister shall, from time to time, determine on the basis of the best available information, the total allowable catch of every fishery category listed in the Seventh Schedule within Fiji fisheries waters and may allocate maximum allowable catch quotas accordingly to individual offshore licence holders."
- s5A(1): Requirement to hold an offshore licence to take species listed in Seventh Schedule - "A Fiji fishing vessel registered under Section 6 of the Fisheries Act shall not be permitted to land, kill or take any species listed in the Seventh Schedule unless the owner of such vessel shall possess a valid offshore licence."

Marine Spaces Act

- s12(2) "Notwithstanding any other provision in this section or in the Fisheries Act the provisions of that Act relating to the obtaining of licences to take fish or to the registration of fishing vessels shall not apply to the fishing activities of foreign fishing vessels or their crews in the exclusive economic zone."
- s13(1) "The Minister shall from time to time determine on the basis of the best available information (a) the total allowable catch in respect of every fishery within the exclusive economic zone; and (b) the portion of that catch which Fiji's fishing vessel have the capacity to harvest."
- s13(2) "...the remaining portion shall constitute the allowable catch for that fishery for foreign fishing vessels."
- s13(3) "The Minister may from time to time apportion, among countries other than Fiji, the allowable catch for foreign fishing vessels in respect of any fishery within the exclusive economic zone, as determined under subsection (2)"
- s14(1): power to issue licences authorising foreign fishing vessels to fish in the EEZ;
- s14(3): Licences "may authorise fishing generally or may confer limited authority by reference to all or any of the following limitations and conditions, namely as to [inter alia] - (c) the descriptions and quantities of fish which may be taken".
- s15: Grounds for (1) suspension, cancellation or (2) variation of conditions of a licence, (3) not reviewable.
- s16(1): Offence to use a foreign fishing vessel to fish in the EEZ without a licence or in contravention of a licence condition or limitation under s14.
- s22(1): Power to make regulations inter alia (d) "prescribing the classes of licences that may be issued which may include different classes of licences, whether by reference to size of vessel, size of catch, method of fishing, species

of catch or otherwise;" (g) "prescribing conditions under which foreign fishing vessels may fish in the exclusive economic zone"; (h) "prescribing measures for the conservation and management of fisheries resource within the exclusive economic zone;" (i) "prescribing measures for ensuring that foreign fishing vessels comply with the limitation and conditions of their licences;" (l) "prescribing measures, not inconsistent with the provisions of this Act, for the regulation of fishing for highly migratory species within Fiji fisheries waters and in the case of Fiji fishing vessels, beyond the limits of those waters;" and (m) "providing for such other matters as appear to him to be necessary for giving full effect to Fiji's sovereignty or sovereign right over Fiji fisheries waters."

- s23 "The provisions of this Part shall not apply to nor prohibit or restrict fishing by foreign fishing vessel for fisheries research or sporting purposes with prior consent in writing of the Minister and in accordance with such conditions as the Minister may impose in giving his consent."

Offshore Fisheries Decree

- s2 defines each instrument;
- s2: definition of property excludes any fishing right or other form of allocation under this Decree;
- s8(1)(c) Power to make decisions on licensing;
- s8(5): Power to enter into commercial access agreements;
- s16: Power to declare a designated fishery;
- s17: Fishery management plan to be prepared for each designated fishery;
- s17(3): FMPs shall specify inter alia (e) the process for the allocation of any fishing rights provided for in the FMP; and (i) provisions for any other matter necessary for the sustainable use of fisheries resources;
- s20: implied power to enter into treaties, multilateral access agreements and commercial access agreements;
- s20(2) Treaty MAA or CAA may provide for inter alia (a) authorisation of fishing, related activities o other activities or operations described in this Decree; (b) the issuance of licences for fishing, related activities or operations described in this Decree;
- s21: Power to make regs as necessary and attach licence conditions to give effect to ICMMs or treaty or arrangements to which Fiji is a member;
- s22(1): "The Permanent Secretary may make, amend or revoke allocations for any fishing activity within the scope of this Decree, in accordance with the provisions of this Decree and any applicable Fisheries Management Plan, access agreement or fishery management agreement."
- s22(2): Requirements for allocations under treaties, MAA or CAA;
- s22(3): Right of review and appeal is limited and no right of compensa-

tion for decision under s22(1);

- s22(4): Power to determine and declare the nature, extent and duration of statutory fishing rights derived from an allocation;
- s22(5) Right to apply for statutory fishing rights or quota;
- s26(1): Requirement that all fishing vessels or vessels used for sport or recreational fishing in Fiji water hold a valid licence, authorisation or fishing right, or operate under a FMP, access agreement of fisheries management agreement;
- s27(1): Fiji fishing vessels required as relevant to comply with laws of another state and under an authorisation (s32), a treaty or MAA, a high seas authorisation (s32) or an ICMM;
- s28: requirement that Fiji nationals use of be employed on a foreign flagged vessel on high seas only with authorisation from flag state;
- s29: Power of PermSec or administrator to issue a licence;
- s30: Licences subject to prescribed conditions and special conditions, including (3) (c) the target species and amount of fish authorised to be taken, including any restriction on bycatch and (f) restrictions on the numbers, types, sizes, specifications or operations of fishing related equipment or vessels;
- s31(1): Power to vary special conditions;
- s32: Power to issue a licence or authorisation to the owner or operator of a Fiji fishing vessel for use in the Fiji fishery waters, the high seas or the waters of another state;
- s33(2) Requirement that foreign fishing vessels operate in Fiji fishery waters under a valid licence or under an applicable treaty, MAA or CAA;
- s34: Power to issue a licence to owner or operator of a foreign fishing vessel for use in Fiji EEZ;
- s35: All licences and authorisations valid for max 36 months, and no longer than validity of relevant treaty or access agreement;
- s35(3): transferability of licences;
- s36: Grounds for refusal to issue licence;
- s37: Licence or authorisation automatically terminates where a material circumstance changes, including change in name, charter, ownership, flag or gear;
- s38(1): Grounds for cancellation or suspension on licence or authorisation;
- s38(4): Cancellation or suspension only under terms of a relevant treaty or MAA where relevant;
- s39(1): Duty to maintain a record of all licensed fishing vessels authorised to fly the Fiji flag;
- s43: Right to appeal against refusal to issue licence;
- s104(1): Power to make regulations, (2) including in relation to (b)

licensing authorisation of vessels, and (c) of fishermen, gear and other equipment or device used for fishing, and (l) licensing and control and use of FADs and the rights to aggregated fish;

- s104(3): Power to provide for the establishment of a regime of statutory fishing rights, and make regs to that effect.

Offshore Fisheries Management Regulations 2014

- s7(1) "The Minister may by notice in the Gazette declare that an international conservation and management measure is a measure applicable to Fiji fishing vessels and foreign fishing vessels in Fiji fisheries waters, and Fiji fishing vessels beyond Fiji fisheries waters."
- s7(2). "An international conservation and management measure declared under subregulation (1) is deemed to be a condition of any fishing licence or authorisation issued pursuant to the Decree and shall be complied with by the master. owner, operator or person chartering a fishing vessel as the case may be".
- s10(1): "Notwithstanding the requirements in any written law, no citizen or national of Fiji shall charter a foreign fishing vessel for the purposes of fishing or related activities within Fiji fisheries waters or beyond such waters except with the authorisation of the Permanent Secretary and in accordance with the requirements under these Regulations."
- s11(1) "Notwithstanding the requirements under the maritime and shipping laws of Fiji, no citizen of Fiji shall charter a Fiji fishing vessel for the purposes of fishing or related activities within Fiji fisheries waters or beyond such waters except with the authorisation of the Permanent Secretary and in accordance with the requirements under this regulation."
- s15(1) "A Fiji fishing vessel shall not be used for fishing or related activity within Fiji fisheries waters except with a licence to fish issued by the Permanent Secretary pursuant to section 32 of the Decree."
- s16(1) "Unless otherwise provided in the Decree, a person shall not use a foreign fishing vessel for fishing or related activity within the exclusive economic zone except with a licence to fish issued by the Permanent Secretary pursuant to section 34 of the Decree"
- s16(2) "The owner or operator of a locally based foreign fishing vessel or foreign fishing vessel may apply for a licence to fish within Fiji's exclusive economic zone for tuna species only in the respective forms set out in Schedule 6B."
- s17(1) " A Fiji fishing vessel shall not be used for sport fishing or recreational fishing within the archipelagic waters, territorial sea or exclusive economic zone unless licenced by the Permanent Secretary pursuant to section 32 of the Decree".
- s20(1) "A Fiji fishing vessel shall not be used for fishing or related activity beyond Fiji fisheries waters except with an authorisation to fish issued by the Permanent Secretary pursuant to section 32 of the Decree."

- s21(3) power to attach conditions to a licence or authorisation, and "(e) may specify such further conditions in relation to any fishing permitted under the permit, including any applicable conditions in relation to total allowable catch or effort, as are necessary or desirable;
- s22(1) Where authorised to fish in waters of another state, requirement to inter alia comply with licence conditions and applicable laws of the other state; and on the high seas, comply with any applicable ICMM.
- s25 re transferability.
- s28 Duty to maintain a record of offshore fishing companies.

Transfer provisions:

Fisheries Act

- s5(2). "Every licence granted under this Act shall terminate on the 31st December next after the day of issue. It shall be personal to the holder, shall not be transferable and shall be subject to such conditions as the licensing officer shall think fit to endorse thereon in accordance with this Act or any regulations made thereunder."

Fisheries Regs

- s4A(4): "Every offshore licence granted under this regulation shall be specific to a single Fiji fishing vessel, shall not be transferable to another vessel and shall have no monetary value"

Marine Spaces Act

- No explicit provisions

Offshore Fisheries Management Decree

- s35(3): "Except as may be otherwise prescribed by the Permanent Secretary in connection with the limitation of effort in any fishery, a licence issued in respect of any vessel shall not be transferable"
- s104(3) "The Minister may provide for the establishment of a regime of statutory fishing rights, and in doing so may make Regulations on the following matters—
    - (a) the method of applying for a right of access or quota share;
    - (b) the identification of criteria for determining those eligible to apply for a statutory fishing right;
    - (c) the nature of a statutory fishing right;
    - (d) the duration of a statutory fishing right;
    - (e) the criteria for adjusting the fishing rights allocated from one

period to another due to fluctuations in the availability of the stocks to which the rights relate;

- (f) determining whether the statutory fishing right shall be inheritable, leasable, saleable, or divisible;
- (g) the number of rights or quota any person or company may hold at any one time;
- (h) the method of calculation of any quota which may be expressed as part of the Total Allowable Catch or the Total Allowable Catch for a particular species; and
- (i) the circumstances in which a statutory fishing right may lapse, be reduced, suspended, reallocated or cancelled.

Offshore Fisheries Management Regulations 2014

- s10(a) A person authorised to charter a foreign vessel must comply with conditions, including that (a) "the charter party in respect of a vessel shall **not be altered or amended** except with the approval of the Permanent Secretary"
- s25(1) "A licence or authorisation issued to a vessel shall not be transferred to another vessel except in accordance with section 35(3) of the Decree and the requirements in this regulation."
- s25(2) "The Permanent Secretary may approve the transfer of a licence or authorisation where -

(a) such transfer is from one Fiji fishing vessel to another Fiji fishing vessel owned by the same company in the Record of Offshore Fishing Companies under regulation 28; and (b) the licensed or authorised Fiji fishing vessel requires maintenance and repairs; or other reasons prescribed in connection with the limitation of effort in any fishery, provided that a licence or authorisation of a Fiji fishing vessel can be transferred no more than two times within a year."

- s25(3) "The operator of a Fiji fishing vessel intending to apply for a transfer of a licence or authorisation shall apply to the Permanent Secretary in the approved form and pay the relevant fees set out in Schedule 7 with such fees being non-refundable. "
- s25(4) "An application for the transfer of a licence or authorisation shall include - (a) documentary evidence of the maintenance and repairs required to be undertaken on the licensed Fiji fishing vessel; (b) such documents specified in the application form; and (c) other information as may be required by the Permanent Secretary."
- s25(5) "Where there is insufficient evidence or information accompanying the application upon which to make a decision regarding the application, the Permanent Secretary shall return the application to the applicant with detai1s of his or her reasons, and the applicant may submit a revised application with such additional evidence or information as may be appropriate."

- s25(6) "The operator of a Fiji fishing vessel and the person to whom a licence or authorisation has been transferred shall comply with all the conditions of the transfer of the licence or authorisation."
- s25(7) "Any person who - (a) fails to comply with a condition of a transfer of licence or authorisation; (b) fails to provide hue, complete and accurate information; or (c) otherwise contravenes or fails to comply with this regulation, commits an offence."

Notes:

Fisheries Act

- Licence assigned to a person
- Section 9 of the Act contains

Fisheries Regulations Fisheries Regs

- Offshore licence held by a person but appear to relates to a specific vessel (s4A(4));
- Quota can only be issued to a

licence holder (s4B(1)) Marine Spaces Act

- s14(3). Licences to be issued "to the owner in respect of a specific boat to be identified by name in the licence"

Offshore Fisheries Decree

Offshore Fisheries Management Regulations 2014

- s2(2): "A reference to the holder of a licence or authorisation shall, in the case of a fishing vessel licence or authorisation, be deemed to be a reference to the operator of the vessel or, in the case of a foreign vessel, the operator or legal representative of that vessel."

FFA Member: Kiribati

Legislation: Fisheries Act 2010

Source: PACLII. Also available at FAOLEX

Currency: Amended in 2015 and 2017. PACLII does not have any legislation since 2017 and no regs after 2005.

Instruments:

- Licence;
- Right to fish;
- Authorisation;
- International authorisation;
- Recreational fishing licence;
- Licence to fish on a customary fishing ground.

Licence-related provisions:

- s5(1) Power to determine a designated fishery;
- s5(3): Duty to prepare a fishery management plan for each designated fishery;
- s5(4): Regs may provide for (1) and (3);
- s6(2): FMPs must (d) provide for a scheme of licensing, if necessary, or other appropriate management measure; and (e) specify, if applicable, the licensing regime to be applied, including the limitations, if any, to be applied to local fishing operations and the amount of fishing, if any, to be allocated to foreign fishing vessels;
- s6(6): Regs may provide for enforcement of FMPs and (7) other matters such as restrictions on the right to fish;
- s7(1): Requirement to comply with scheduled treaties whether inside or outside Kiribati waters;
- s7(2): Regs may prescribe treaties to be scheduled treaties and identify parts of treaties or specific obligations in a scheduled treaty with which the operator must comply;
- s7A: Scheduled treaties have the force of law with respect to Kiribati registered vessels and Kiribati licensed vessels;
- s7B: Power to give effect to ICMMs;
- s9: Licence or authorisation is valid for as long as stated or until cancelled or suspended;
- s9: Licence or authorisation is (a) subject to general and specific conditions; (b) is not transferable; and (c) does not give the licensee an exclusive right to fish, unless the Minister gives prior written approval endorsed on it.
- s10: (1) Grounds for suspension or cancellation of a licence and (2) right of appeal;
- s11: (1) A person may apply for a licence for a local fishing vessel; (3) (a) valid for max 1 year unless Minister decides otherwise; (b) licence is personal to the holder;
- s12: (1) A person may apply for a licence for a foreign fishing vessel; (2) Power to grant a licence to a foreign fishing vessel to inter alia (a) fish in Kiribati waters; (2A) Power to prohibit a foreign fishing vessel, as a licence condition, from inter alia (a) fishing on specific high seas areas or (d) using specific fishing gear or equipment outside Kiribati waters;
- s12(3) Licence is subject to conditions in s9 and (c) compliance with scheduled treaty regardless of whether operating inside or outside Kiribati waters;
- s14B: Requirement to hold a licence for recreational fishing;
- s15: (2) Power to issue an international authorisation to a Kiribati registered vessel to fish outside Kiribati waters; (4) Requirement for a Kiribati registered vessel to hold an international authorisation to fish outside Kiribati waters;

- s15A: Duty to maintain a record of all Kiribati registered vessels licensed or authorised to fish under Act;
- s17: Power to enter into agreements with a person, a government, government agency or international agency; and (2) power to authorise such to issue licences under s12;
- s18: (1) Requirement to hold a licence to fish in a customary fishing ground if person is not a member of the relevant kainga, utu or other division; (3) Power to issue such licences;
- s45(1): Power to make regulations (broad), without limiting, including in relation to (2)(b) procedure relating to issue of licences; placing a limit on the amount, size, weight of fish that may be caught or traded.

Transfer provisions:

- "A licence or authorisation issued under this Act ...: (b) is not transferable"

Notes:

- s11(3): Says a licence is personal to the holder, but in practice they appear to attach to a vessel
- Note also Fisheries (Purse Seine Vessel Day Scheme) Regulations 2014
- The Fisheries (Vessel Licences) Regulations 1981, and Fisheries (Vessel Licences) Regulation (No.1) of 1982 set out fees and application form for licences. Available at http://www.fao.org/faolex/country-profiles/general-profile/see- more/en/?iso3=KIR&countryname=Kiribati&area=Fisheries&link=aHR0cDovL2V4dHdwcmxlZ3MxLmZhby5vcmcvY2dpLWJpbi94bWwuZXhlP2RhdGFiYXNlPWZhb2xleCZzZWFyY2hfdHl wZT1xdWVyeSZ0YWJsZT1hbGwmcXVlcnk9QVJFQTpGSSBBTkQgSVNPOktJUiBBTkQgV DpBTEwgTk9UIFJPOlkgQU5EIFJFUEVBTEVEOk4gQU5EIFNVUEVSUzpOIEFORCBaOih MIFIgTSkgTk9UIFo6UCZzb3J0X25hbWU9QHNwcmZGSSZsYW5nPXhtbGYmZm9ybWF0X 25hbWU9QFhTSE9SVCZwYWdlX2hlYWRlcj1FWE1MSCZwYWdlX2Zvb3Rlcj1FWE1MRg=

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FFA Member: Nauru

Legislation: Fisheries Act 1997, as amended by the Fisheries Amendment Act 2017

Source: RONLAW. Also available at PACLII (last updated in Jan 2019 but does not include 2017 amendments)

Currency: As amended in 2017

Instruments:

- Licence;
- National fishing licence;

- Foreign fishing licence;
- Permit;
- Authorisation (to fish outside Nauru fisheries waters);
- Game fishing licence;
- Game fishing permit.

Licence-related provisions:

- s2 defines licence (include permit or authority), permit (for game fishing 1 month & research), national fishing licence, foreign fishing licence (issued to a foreign fishing vessel), game fishing licence (max 1 year) and game fishing permit (max 1 month).
- s6. Power to enter into conventions, treaties, agreement or arrangements which provide for: (a) the terms and conditions of access to fisheries waters by foreign fishing vessels and licensing procedures in respect of foreign vessels; (b) …the designation of a state or competent regional fisheries agency or its official as Administrator, including their power to issue fishing licences under an arrangement or agreement;
- s8(1): Power to enter into access agreements with other states or fishing associations or similar body of another state to provide for licensing of foreign vessels under this Act;
- s9(1): Power to set a TAC, subject to any criteria with respect to a TAC made by the Republic;
- s9(2): Power to determine the maximum number of licences issued with respect to a fishery or a fisheries activity;
- s10(1): Power to draw up a Fisheries Strategy; (2) which shall inter alia (d) specify the management and development strategies to be adopted for the fishery; and (f) specify the limitations, if any, to be applied to the issue of licences in respect of the fishery; and (g) specify in international units appropriate to the type of fishing, and in accordance with any relevant international, regional or subregional agreement, the amount of fishing, if any, to be allocated to foreign fishing vessels.
- s11: Power, by notice in Gazette to prohibit fishing or fisheries activity inter alia (d) by limits on catches, fishing efforts, the number of persons who may engage in fishing or fisheries activity or any other related matters;
- s12(1): Power to issue licences, permits or authorisations to use a vessel for fishing or a fisheries activity. (2) subject to inter alia conditions imposed by the Act, or in regs, and any fisheries management plan and strategy;
- s12(3). Power to impose general conditions applying to all licences, permits and authorisations;
- s12(4) Power to impose special conditions to any licence, permit or authorisation, and (5) these may be varied;
- s12A(1) Foreign fishing licence valid for max 1 year or any lesser period specified in a multilateral access agreement, and (2) not

beyond the term of a MAA;

- s12A(3) National fishing licence valid for max 1 year;
- s12A(4) Game fishing licence valid for max 1 year;
- s12A(5) licence invalid of national fishing vessel becomes a foreign fishing vessel;
- s12A(6) re transferability;
- s12A(7) Authorisation valid for max 1 year;
- s12B. Ground for refusal to issue a licence or authorisation;
- s12C: Grounds for suspension or cancellation of a licence or authorisation; (3) "If a foreign fishing licence or authorisation is issued by an administrator pursuant to a multilateral agreement, it may be suspended or cancelled only in accordance with the terms of that multilateral agreement.";
- s12E Right to resubmit application to CEO if refused, suspended or cancelled a licence or authorisation;
- s12F(1): Duty to maintain a National Fisheries Register of licences and authorisations issued under the Act;
- s12N(1) Requirement that operator of a national fishing vessels apply for an authorisation to fish beyond Nauru fisheries waters in respect of that vessel; (6) grounds to suspend or cancel an authorisation;
- s12O & s12P Grounds for refusal to issue an authorisation;
- s12Q(1) Legislated conditions attached to an authorisation; (2) Power to attached conditions to an authorisation, including "(c) the descriptions, quantities and size of fish that may be taken";
- s12Q(3) Power to vary conditions attached to an authorisation if "necessary to ensure compliance with Nauru's obligations under a treaty, convention or agreement to which Nauru is a party, or in respect of any applicable international conservation and management measures and resolutions"
- s12Q(8) re transferability of an authorisation;
- s12R(1) Authorisation valid for max 1 year; (2) and void if the vessel is no longer entitled to fly the Nauru flag.
- s12S(1) Power to cancel or suspend an authorisation; (4) CEO decision is final;
- s12T: Offence for a Nauruan fishing vessel to fish beyond the Nauru fisheries waters without an authorisation of in contravention of any condition or restriction on it.
- s12U(1): Requirement that Nauru citizen or corporation use a foreign registered vessel to fish in the waters of another country or on the high seas without an authorisation issued by the flag state;
- s12V: Requirement that persons using national fishing vessels comply with applicable foreign laws and authorisations, MAA or related agreement, a Nauru high seas authorisation or ICMM as applicable.
- s13A: Requirement apply for a licence or authorisation if a Nauru citizen

wishes to charter a vessel for fishing within or beyond the fishery waters; (3) valid for duration of the charter; (4) grounds for refusal;

- s13C: Grounds for suspension of cancellation of licence or authorisation in respect of vessel under a charter agreement;
- s13D: Non-Nauru citizen wishing to charter a national fishing vessel to fish beyond the fisheries waters must apply for an authorisation; (3) valid max for duration of charter agreement, s13F grounds for suspension of cancellation;
- s13H: Power to give legal effect to ICMMs or parts of ICMMs, and make regulations or attach conditions to a licence to give effect to a Treaty of ICMM;
- s23(1): Offence to engage in or use a vessel for fishing or a fisheries activity without a licence where on is required under the Act;
- s24(1): Offence to use a foreign vessel for fishing or fisheries activities in fishery waters without a licence under the Act or inconsistent with international law;
- s36(1): Power to cancel a licence following conviction for an offence under this Act;
- s42:(1): Power to make regulations as permitted under the Act or as Cabinet considers necessary to give effect to the Act, including inter alia:
    - (a) means of determining the TAC either generally or in respect of any individual fishery, the MSY of fish, precautionary reference points, fishing quotas, fishery areas, licence priorities and quotas and related matters, and determining those matters;
    - (b) the grant, conditions, suspension and cancellation of licences, permits and other authorisations to engage in or use a vessel for fishing or fisheries activity;
    - (c) the registration...of vessels;
    - (d) regulating the conduct of fishing and fisheries activities.

Transfer provisions:

- s12A (5): "If a vessel licensed as a national fishing vessel becomes a foreign fishing vessel, the national fishing vessel license is deemed to be rendered as invalid."
- s12A(6): "A licence shall not be transferred to any other vessel, except with the written authority of the Chief Executive Officer unless otherwise provided under an applicable multilateral access agreement."
- s12Q(8): "An authorisation to fish is not transferrable"; s12R(2) "An authorisation to fish is void in the event that the vessel in respect of which it was granted is no longer entitled to fly the flag of Nauru."

Notes:

- s2. "licensee" means a person to whom a licence is issued, whether in

respect of the person or a boat, premises or place;

FFA Member: Niue

Legislation:

- Domestic Fishing Act 1995
- Domestic Fishing Act Regulations 1996/01
- Territorial Sea and Exclusive Economic Zone Act 1997

Source:

Domestic Fishing Act 1995

- PACLII
- Also available at www.gov.nu/wb/pages/legislation/niue-laws.php Domestic Fishing Act Regulations 1996/01
- PACLII. Also available at www.gov.nu/wb/pages/legislation/niue-laws.php Territorial Sea and Exclusive Economic Zone Act 1997
- PACLII

Currency:

Domestic Fishing Act 1995

- Amended by the Maritime Zones Act 2013 Domestic Fishing Act Regulations 1996/01
- Niue Govt website last updated in 2006. Territorial Sea and Exclusive Economic Zone Act 1997
- Amended by the Territorial Sea and Exclusive Economic Zone Amendment Act 2006 and the Maritime Zones Act 2013

Instruments:

Domestic Fishing Act 1995

- Licence;
- Catch quota

Domestic Fishing Act Regulations 1996/01

Territorial Sea and Exclusive Economic Zone Act 1997

- Licence;
- Authorisation (appears to relate to non-fishing activities - see s33(3)(b);
- Licences for FADs

Licence-related provisions:

Domestic Fishing Act 1995

- s12: Power to prescribe by regulation a catch quota or size limit on any fish species;
- s18: Requirement that any boat continuously based in Niue be licensed under the Act;
- s19: Power to grant or refuse to issue a licence to a boat;
- s20: Grounds for refusal of a licence;
- s21: Licence valid max 1 year, into force 1 July, expire 30 June. Domestic Fishing Act Regulations 1996/01

Territorial Sea and Exclusive Economic Zone Act 1997

- s11(2): "No fishing craft shall be used for commercial fishing unless the craft is licensed in accordance with section 28 of this Act";
- s12: Power to declare a designated fishery;
- s13(1): Power to prepare and implement a management and development plan for a designated fishery;
- s13(2): Management and development plan shall inter alia (c) "specify the management measures to be adopted to achieve those objectives"; and (e) "specify the limits within which the fishery may be exploited"; (f) "specify what licensing requirements (if any) are to apply to anyone who wants to operate within a fishery".
- s14(1): Broad power to vary a management and development plan;
- s15(1): power to exempt a person or group of persons from a specific part of a management and development plan; and (2) power to make a declaration to ensure the effective conservation or efficient use of the fishery;
- s16: power to revoke a management and development plan is the objectives have been achieved;
- s17(1): Duty to comply with a management and development plan; or (2) comply with a direction given by an authorised officer that is consistent with the plan;
- s18(1): Unauthorised commercial fishing by a person under the Act is prohibited;
- s18(2): "A fishing craft shall not: (a) do anything in fishery waters that is not authorised or permitted by or under international law; or (b) be used for fishing in fishery waters unless it is licensed, authorised or otherwise permitted to do so by or under this Act or the regulations."
- s22: (1) Power to enter into bilateral or multilateral access agreements; (2)

An access agreement may provide for vessels controlled by the country or its nationals "(a) to be licensed for use in fishing in fishery waters and have access to those waters for that purpose; and (b) engage in any other related activities."

- s22(4): Elements that must be included in access agreements, including (a) "provide for fishing allocations at a level consistent with the proper conservation and management of fishery resources;" and (g): "provide for the issuing of licences for fishing in fishery waters, or in a specified part of those waters, on terms and conditions consistent with this Act."
- s23: A licence or authorisation issued under an access agreement is deemed to have been issued under the Act;
- s24: "(1) A multilateral access agreement may authorise a person or body to act on behalf of the Government of Niue, or to act on its behalf in the performance of any obligations, duties or responsibilities (including the issue of licences)"; "(2) Any act done by any person, on behalf of the Government of Niue under an authority given in a multilateral access agreement is taken to have been done by the Government of Niue."
- s25: Grounds upon which some provisions of an access agreement may have no effect;
- s26: Power to enter into related agreements for the promotion of fisheries cooperation and harmonisation between Niue and other countries;
- s27(2): Licence applications must include inter alia: "(e) the allocation of the fishery resources sought"
- s281): Power to issue a licence permitting a fishing craft to be used for inter alia fishing;
- s28(3): A licence shall inter alia: "(b) provide fishing allocations at a level consistent with the proper conservation and management of fishery resources; and (c) be consistent with any relevant management and development plan;"
- s28(4) Power to impose special conditions, including "(c) the target species and quantity of fish authorised to be caught, including restrictions on by-catches; (d) the term of the licence".
- s29(1): Power to specify general conditions applicable to all licences;
- s30: Power to add to, vary or revoke a special or general condition if necessary to ensure the proper conservation or management of fishery resources.
- s32(1): Licence valid for 1 year, subject to any special or general conditions, and (2) may be renewed;
- s35 on transferability;
- s36: Grounds for cancellation or suspension of a licence;
- s37: Right to appeal to a Judge of the High Court against a cancellation or suspension;
- s60: Broad regulations power, including for (without limitation): "(a) Providing for the conservation, management, development, licensing and

regulation of fisheries or any particular fishery;" "(b) Licensing authorisation or registration in respect of any fishing craft or class or category of fishing craft to be used for fishing, related activities or any other purpose pursuant to this Act, including the form, issuance requirements, grounds for denial, terms and conditions, and fees, charges, royalties, and other form of compensation related to the licensing, authorisation or registration;" "(c) Licensing, authorisation or registration in respect of any fisherman or class of fisherman, fishing gear and other equipment or device used for fishing;" "(l) The licensing, control and use of fish aggregating devices and the rights to the aggregated fish, and prescribing times and the minimum distances from the device any vessel may fish around it;".

- "(y) Regulating for –
  - (i) The implementation of an access agreement;
  - (ii) The implementation of any agreement to which the Government of Niue is a party relating to the establishment of uniform tests and conditions as between the parties to the agreement in respect of conservation, management, exploitation and surveillance, and
  - (iii) Access to and enforcement measures undertaken within the fisheries waters of each party;"
- "(z) Giving effect to the following International Conventions upon their ratification by the Government of Niue and their entry into force under international law or for Niue, as the case may be –
  - (i) The United Nations Conventions on the Law of the Sea 1982;
  - (ii) The Agreement for the Implementation of the Provisions of [UNFSA]"
  - (iii) The Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (the WCPT Convention);
- "(za) Prescribing the requirements for fishing in areas under national jurisdiction of a foreign country or on the high seas or in areas subject to international conservation and management measures in accordance with international law binding on Niue by vessels carrying the flag of Niue or nationals of Niue ordinarily resident in Niue or foreign nationals ordinarily resident in Niue using vessels carrying the flags of other states; "
- "(zb) Implementing any decisions of international and regional fisheries management bodies of which Niue is a member or with which Niue has agreed to cooperate."

Transfer provisions:

Domestic Fishing Act 1995

- No explicit provisions

Domestic Fishing Act Regulations 1996/01

Territorial Sea and Exclusive Economic Zone Act 1997

- s35
    - (1): "A license or authorisation issued or granted under this Act is not transferable, except with Cabinet's approval or in accordance with an access agreement";
    - (2) "Any provision in a contract or arrangement that purports to assign, transfer or dispose of all or any of the rights or benefits conferred by a licence or authorisation issued or granted under this Act is void."
    - (3) "Each person who enters into an agreement or arrangement that contains a provision of the kind described in subsection (2) of this section is guilty of an offence."
    - (4) "For the purpose of this section, the charter of a fishing craft in respect of which a license or authorisation has been issued or granted under this Act, is taken to be transfer of the license or authorisation."

Notes:

Domestic Fishing Act 1995

- The fishery waters, defined by internal waters, territorial sea, EEZ and continental shelf as defined in the MZA 2013

Domestic Fishing Act Regulations 1996/01

Territorial Sea and Exclusive Economic Zone Act 1997

- s11(1): The Act applies to every person, fishing craft or vessel fishing in the fishery waters
- s27(1): licences appear to attach to a vessel

Note also the Domestic Fishing Act 1995 Domestic Fishing (Annual Fees) Regulation 2007

FFA Member: Palau

Legislation: Marine Protection Act 1994: Title 27 Fisheries: Division 1 and Division 2

Source: PACLII

Currency: PACLII last updated 10 Feb 2017

Instruments:

- Foreign fishing permit (s123);
- Allocation (of total allowable foreign fishing to foreign nations);
- Traditionally recognised fishing rights in submerged reef areas (s146);
- Special bait fishing permit;
- Permit (s1205);

Licence-related provisions:

- s122: Regulations power;
- s123: Power to adopt regulations; negotiate and conclude foreign fishing agreements; issue foreign fishing permits; other duties;
- s161(a): Foreign fishing vessel required to be part of a foreign fishing agreement and hold a valid licence to fish in territorial sea, internal waters, contiguous zone of within 50nm radius to the east of the Malakal Harbour entrance;
- s161(b): Foreign fishing vessels must comply with Palau law, any regs, any permit issued and any relevant fishing agreement to fish in the EEZ (other than areas in (a));
- s162: Foreign fishing agreements to recognise Palau National Govt exclusive fishery management authority;
- s163: Required terms and conditions in foreign fishing agreements; including that (d)(3) foreign parties not fishing EEZ without a valid permit and in compliance with permit terms and conditions;
- s164: Defines total allowable foreign fishing;
- s165: Duty to allocate total allowable foreign fishing annually to foreign nations, and by regulation establish TAFF, catch limits and allocation thereof;
- s167(b): Fishing permits to be issued in accordance with foreign fishing agreement approved by joint resolution of the Olbiil Era Kelulau (except non-commercial fishing in accordance with s171);
- s170: Grounds to revoke a permit;
- s171: Power to issue permits to foreign vessels for research, recreational or other non-commercial fishing in the EEZ;
- s172: Power to issue special bait fishing permit for use in the fishery for highly migratory species;
- s1205(a): Requirement to hold (and power to issue) a permit for taking of fish for (1) local aquarium use; (2) scientific research, maricultural research or medical research; brooding stocks for mariculture or aquaculture; (4) re cultured species listed in s1204;
- s1206: Power to make regulations to protect species listed in s1204 as deemed necessary;

Transfer provisions:

- No explicit provisions for transfer of foreign fishing permits but potential allowable under a the regulations power (s122) and in the terms and conditions of a foreign fishing agreement (s123);

Notes:

- Div 1 (s101-s305): Foreign fishing

- Div 2 (s1101-s1211): Domestic fishing
- Permits under Div2 (domestic fishing) do not appear to relate to commercial harvesting. No explicit provisions for transfers of permits, but broad regulatory powers;

FFA Member: PNG

Legislation: Fisheries Management Act 1998

Source:

- PACLII
- Also available at http://www.parliament.gov.pg/bills-and-legislation

Currency:

- Replaced Fisheries Act 1994
- Amended in 2012 (http://www.parliament.gov.pg/bills-and-legislation/2012), and twice in 2015 (http://www.parliament.gov.pg/bills-and-legislation/2015).
- Unclear whether amended between 1998 and 2012

Instruments:

- Licence;
- Authorisation;
- Rights of customary owners;
- Foreign fishing licence;
- Fishing quota;
- Fishing effort

Licence-related provisions:

- s2 define licence as a licence or authorisation required under this Act;
- s6: National Fisheries Authority (1) shall (b) make recommendations to the National Fisheries Board on the granting of licences and implement any licensing scheme in accordance with this Act;
- s7(1)(b) Board has power to make decisions on licences in accordance with the Act;
- s26: Recognises customary resource rights and fishing rights
- s28(2): Power to draw up a Fishery Management Plan;
- s28(3): FMP shall, inter alia, identify any relevant customary fishing rights or practices;
- s28(7): Provisions of an FMP have same effect as licence conditions under s43;
- s30: Power of the Board to prohibit specified activities;

- s33(1): Power to enter into access agreements;
- s33(2): Foreign fishing vessels must fish under an access agreement and in accordance with a valid and applicable licence issued under s41 or s44;
- s35(2): Conditions to be attached to a licence issued to a foreign fishing vessel subject to an access agreement, including inter alia, (g) requirement to comply with terms and conditions for fisheries access that may be prescribed from time to time;
- s36: Access agreements to be valid for max 11 year;
- s37(1): Power to enter into Fisheries Management Agreements, which may (2)(a) authorise a person or body to allocate, issue, and deny fishing licences valid in teh region or part thereof, including in the EEZ
- s40: Power to cooperate with other states to achieve compatible CMMs for highly migratory stocks;
- s40(B)(2): Power to give force under PNG law to any ICMM, and (4) and to give effect to an ICMM by making regs or attaching licence conditions;
- s41: Power to grant licences;
- s41A: Grounds for refusal to grant a licence; (5) decision to refuse is not justiciable; but s44(1) right of appeal to Minister;
- s41B: Grounds for cancellation or suspension of a licence; (4) right of appeal;
- s43(1): Power of the Board to impose terms and conditions from time to time;
- s43(3): required terms and conditions;
- s43(7): requirement to maintain a register of licences issued under Part IV Division 1;
- s44: right of appeal against refusal to issue;
- s45: Foreign fishing licences issued by an Administrator under an access agreement are deemed to licences under the Act
- s46(1): Requirement to hold a licence where a licence is required;
- s46(2): Requirement to comply with licence terms and conditions;
- s76(1): Power to make regulations, including for (a) "providing the means of determining the allowable level of fishing, the maximum sustainable yield of fish, fishing quotas, fishing effort, fishery areas and related matters, and determining those matters"; (b) "providing for the implementation of any provisions of a fishery management plan drawn up under Section 28"; (g) licensing

Transfer provisions:

- s76(1) Power to make regulations including for (g) "licensing persons and vessels for fishing, related activities, and such other activities related to fishing which may require licensing for the purposes of this Act, the suspension, cancellation and transfer of licences, the priorities (if any) of grants of

licences, the issuing of permits and. other authorities connected with fishing or related activities, and the registration of fishing equipment"

Notes:

- Regs can make a licence transferable;
- Nothing appears to prevent a FMP from including transfer provisions, which can then be included in regs

FFA Member: Marshall Islands (RMI)

Legislation:

- Fisheries Act 1997 (as at 26Feb19)
- Fisheries Access and Licensing Act 1997 (as at 26Feb19)
- Fisheries Enforcement Act 1997 (as at 26Feb19)

Source:

- RMI Parliament website.
- 2014 consolidated versions also available at PACLII

Currency:

- All amended in 2011.
- Legislation accessed on 27 Feb 2019 at https://rmiparliament.org/cms/legislation.html?view=acts_alpha was current as at 26 February 2019

Instruments:

Fisheries Act

- Licence;
- Allocation;
- Participatory rights; Fisheries Access and Licensing Act
  - Licence

Fisheries Enforcement Act

- Authorisation to fish beyond the fishery waters

Licence-related provisions:

Fisheries Act

- s202: "Exclusive management and control over living and non-living resourc-

es within the Fishery Waters is vested in the Government"

- s205: "The Authority may determine the total allowable level of fishing with respect to any stock of fish subject to the provisions of this Title or as provided in a fisheries management agreement and in so doing shall take into account the requirements of Sections 203 and 204."
- s206(1): "The Authority may determine participatory rights in the fishery, such as allocations of allowable catch or levels of fishing effort...";
- s207(1): Power to authorise a designated fishery;
- s207: (2) Duty to prepare and implement a plan for the management and development of each designated fishery in the fishery waters; and (3) for other fisheries as practicable;
- s207(4): Fisheries plans shall inter alia: "(h) determine the amount of the fishery resource, if any, to be made available to licensed fishing vessels; (i) specify the conservation and management measures to be enforced to protect the fishery resource from over-exploitation".
- s207: (8) "Upon the approval of each plan, such regulations as may be necessary for its implementation shall be promulgated."
- s208(1) "The Authority may take measures for the conservation and management of fish in the Fishery Waters...";
- s210: power to (a) exempt artisanal fisheries from licensing requirements; and (d) give priority to artisanal fisheries in the allocation of fishing licenses or quotas;
- s212: "...authority to cooperate with States fishing on the high seas in respect of [highly migratory] stocks for the purpose of achieving compatible conservation and management measures...", taking into account inter alia "(c) previously agreed measures established and

applied in accordance with the United Nations Convention in respect of the same stocks by a sub- regional or regional fisheries management organization or arrangement".

- s213(1): "The Minister shall consult, as appropriate, with foreign governments and in particular with governments of countries sharing the same or interrelated stocks with a view to:...(c) establishing, on a bilateral or regional level as appropriate, arrangements regarding fishing rights with other States in accordance with the provisions of the relevant Fisheries Management and Development Plan."

Fisheries Access and Licensing Act

- s402(1): Duty to comply with the Title, any other RMI law or applicable access agreement except for innocent passage or force majeure in accordance with international law.
- S403(1): "No foreign or domestic-based fishing vessel shall be issued a license to fish in the Fishery Waters unless an applicable access agreement is in force, duly entered into by the Authority in accordance with this Title"
- s405: Access agreement validity max 10 years, renewable;
- s406(1): Access agreement to recognise RMI sovereign rights and exclusive management authority in the fishery waters;
- s407:(1) Power to enter into fisheries management agreements, which may inter alia (a) authorise a person, body or organisation including allocation, issuance and denial of fishing licences valid in the region or part thereof, including the EEZ;
- s408(1): Power to (a) exempt a vessel or class of vessels from a provision of the Title if it is inconsistent with a multilateral access agreement;
- s410: (1) Power to require licences to be held by, inter alia, any person or class of persons, fishing vessel or class of fishing vessel; but exemptions for inter alia (a) any fishing vessel licensed under a multilateral access agreement to which RMI is a party and which designates a licensing authority outside RMI; (b) subsistence fishing;
- s410(3) Offence to use a vessel without a valid and applicable licence or in contravention of its terms or conditions;
- s411(1): Power to issue licences for inter alia: (a) fishing; (f) sport fishing; (2) Power to issue licences to RMI registered vessels to fish outside the fishery waters;
- s412: (1) "No person may use a domestic-based or foreign fishing vessel for fishing in the Fishery Waters without a valid and applicable license issued in accordance with this Title";
- s413(6) Power of Director to attach conditions as the Director sees fit, and as may be prescribed;
- s413(7): Power of Authority, by decision or regulation, to (require inter

alia (b) any conditions which may or shall be attached to a licence; (c) criteria for renewal, refusal, suspension or cancellation of a licence; (e) period of validity of licences; (f) requirements for the transfer of licences; (g) offences, fines and penalties.

- s414(3)&(4): Grounds for denial of a licence and/or renewal;
- s413(5): Duty to deny a licence under certain circumstances;
- s413(6): Decision to deny is final.
- s415: Grounds upon which a licence may be suspended, revoked or have additional conditions or restrictions imposed;
- s416: Licence valid for max 1 year and no longer than any applicable chart agreement or access agreement;
- s422: Power to attach a fishing plan to a licence;
- s424: (1) Power to, by regulation, require that any fisher or class of fisher or vessel or class of vessel be registered with the Authority, and where one is required, (2) duty to maintain a register;
- s425: Offence to operate without a licence or in contravention of its conditions;

Fisheries Enforcement Act

- s503(1): Duty to maintain a record of fishing vessels entitled to fly the RMI flag that are authorised to fish beyond the fishery waters; (2) Information to be recorded is set out in Schedule 1 and (3) Director may require further information in order to comply with relevant regional and subregional measures; (4) these requirements are in addition to those in the Maritime Administration Act; (11) offence to fish outside the fishery waters without providing the required information; (12) Fishing vessel authorisation may be cancelled if it contravenes this section.
- s504: Requirement to hold an Authorisation to fish outside the fishery waters and must operate in accordance with (a) the laws and licence conditions of any relevant foreign coastal state; (b) any treaty or multilateral access agreement; (c) in accordance with a licence issued under s503 (high seas); (d) any ICMMs.
- s504(6): Authorisation to fish beyond the fishery waters may be subject to any conditions the Authority considers appropriate, including relating to inter alia: "(c) the species, size, age, quantities of fish that may be take; (i) measures to give effect to sub-regional, regional and international fisheries conservation and management measures". (8): holder of an authorisation must notify the Authority of a change in ownership of the vessel of operator of the vessel;
- s504(9): Power to cancel an authorisation where holder is found guilty of an offence against this Title or has an IUU record subsequent to its issuing.
- s505: Power to make regs governing RMI citizens and corporations using foreign flagged vessels beyond the fishery waters.

Transfer provisions:

Fisheries Act

Fisheries Access and Licensing Act

- s413(7): "The Authority may, by decision or regulation. require, inter alia: (f) requirements for the transfer of licenses".

Fisheries Enforcement Act

- s504(8): "The holder of an authorization to fish beyond fishery waters must duly notify the Authority within seven (7) working days of the change of ownership of the vessel or operator of the vessel."

Notes:

Fisheries Enforcement Act

- Authorisation is issued to a operator, master, charterer, lessee or agent of a fishing vessel

FFA Member: Samoa

Legislation: Fisheries Management Act 2016

Source:

- PACLII
- Also available at: http://www.palemene.ws/new/parliament-business/acts-regulations/acts-2016/ and https://www.maf.gov.ws/index.php/acts-and-reguulations

Currency: Replaced Fisheries Act 1988. No other primary legislation on fisheries since 2016 (Source: http://palemene.ws)

Instruments:

- Authorisation;
- High seas authorisation;
- Flag state authorisation;
- Fishery allocation;
- Fishing right;
- Licence;
- Implied sport fishing licence (if fish is to be sold);
- Rights to aggregated fish.

Licence-related provisions:

- s2 defines Authorisation, high seas authorisation, fishery allocation, fishing right, and licence as instruments issued under the relevant provision in the Act;
- s2 excludes from the definition of property a fishing right and a fishery allocation;
- s17: Power to enter into fisheries treaty, agreement, arrangement or commercial access agreement;
- s18: Power to give effect to ICMMs;
- s20: Power to declare a designated fishery
- s21: Duty to prepare a fishery management plan for a designated fishery; (2) FMP must (iv) specify the process for the allocation of any fishing rights provided for in the FMP;
- s23(1): Samoan fishing vessels require a licence, inter alia, to fish in the fishery waters;
- s23(2): licence required if fish caught under sporting activity is to be sold;
- s24(1): Samoan fishing vessel must (a) comply with laws of another country when operating in its waters; (b) operate in accordance with a treaty or multilateral access agreement in waters where one applies; (c) on high seas with a high seas authorisation; operate in accordance with ICMMs where they apply;
- s24(2): Power to issue and impose conditions on a high seas authorisa-

tion; (3) Power to vary, suspend or impose conditions, including, inter alia, (b)(iii) the descriptions, quantities, size or presentation of fish which may be taken;

- s26: (1)(b): Foreign fishing vessels operating in the fishery waters require a licence (s28)(1) or do so under a fisheries treaty;
- s28(1)(a): Power to issue a licence to the owner or operator of (a) a foreign fishing vessel; and (b) a Samoan fishing vessel, to be used in the fishery waters;
- s29: Grounds for refusal of a licence;
- s30(3): Power to impose special conditions on a licence issued under Part 3 (Licences) (ss23-35), including (c) the target species and amount of fish authorised to be taken, including a restriction on by-catch;
- s30(4): Power to vary, suspend or revoke any special conditions;
- s31: Licences valid (1) for max 12 months, and (2) no longer than the expiry of a treaty or agreement; (3) re transferability;
- s33: Duty to maintain a register of fishing vessels licensed under s28;
- s34: Power to suspend or cancel licences; and s35 right of appeal (judicial review);
- s36: Power to make, amend, suspend or revoke a fishery allocation ((2) defined as the allocation of a specific amount of catch or fishing activity for a fishery);
- s37: Power to grant a fishing right to a person or class of persons, setting out, inter alia (a) method of applying for a right of access or quota share; (c) duration; (d) criteria for adjusting the fishing rights allocated from one period to another; (e) re transferability; (g) method of calculation of a quota; (h) the circumstances in which a fishing right may lapse or be reduced, suspended or cancelled;
- s92: Power to make regulations, including in relation to licensing, and (l) regulating FADs and the rights to aggregated fish

Transfer provisions:

- s31(3): "A licence for a vessel is not transferable to any other vessel except:
  - (a) with the prior written permission of the Chief Executive Officer;
  - (b) under a fishery management plan or an access agreement; or
  - (c) as allowed by regulations."
- s37: "The Minister may grant a fishing right to a person or class of persons, by notice in the Savali setting out any or more of the following: determining whether the fishing right is inheritable, leasable, saleable, or divisible"

Notes:

- Note s31 only refers to transfer between vessels, not persons;
- Not clear what the relationship is between a fishing right and a licence;
- Agriculture and Fisheries Ordinance 1959 and Local Fisheries Regulation 1995 both appear to still be in effect - this is possible under the FM Act 2016 (s94(6)). But they do not appear to be relevant. Available at https://www.maf.gov.ws/index.php/acts-and-reguulations

FFA Member: Solomon Islands

Legislation:

- Fisheries Management Act 2015
- Fisheries Management Regulations 2017

Source:

- Act: PACLII
- Regs: Ministry of Fisheries & Marine Resources

Currency:

- Act: Replaced Fisheries Act 1998. Also available at https://fisheries.gov.sb/fisheries-acts
- Regs: Available at https://fisheries.gov.sb/fisheries-acts

Instruments:

- Fishing licence;
- Licence;
- Authorisation (foreign fishing vessel);
- Endorsement;
- Vessel days;
- Customary rights;
- Licence issued by an Administrator;
- Permission to place a FAD.

Licence-related provisions:

Act:

- s2(1). Licence, fishing licence and customary rights are defined in s2(1);
- s11. re Fisheries Appeals Committee functions;
- s10. re Fisheries Licensing Committee powers;
- s17(7)(ii). Licensing, enforcement powers and authorities in Fisheries Management Plans have legal status of regulations;

- s18. Power to draw up a Community Fisheries Management Plan (Schedule 2: CFMP to include in its description of the fishery, inter alia, s3(f) any customary rights, and s10 may provide for a commitment by relevant community, customary owners or rightsholders and other stakeholder to carry out and authorise fishing;
- s21(1). "Customary rights shall be full recognised and respected in all activities falling within the scope of this Act".
- s31. Permission to place a FAD;
- s34: re Register of licences and authorisations;
- s38(1): Minister may authorise a foreign fishing vessel to be used in the fishery waters in accordance with a FMP, international agreement, national policy or national strategy; (2) Such agreement may be by way of, inter alia, (b) the grant of fishing rights (specifies conditions that may be attached)
- s38(2): Minister may enter into an agreement;
- s38(6): Foreign fishing licence and authorisations may be granted only in accordance with access agreements (s38);
- s39(1)(a): Access agreements must require any vessels to hold a valid licence or authorisation from the flag state;
- s39(1)(c): An Administrator may issue a licence under a multilateral access agreement
- s43(1): Licence or authorisation required for, inter alia, (a) fishing related activities (defined in s2(1)); (b) using Solomon Islands fishing vessel for fishing or fishing related activities beyond the fishery waters; (c) artisanal fishing (some qualifications); (k) commercial sport fishing;
- s45: Power to grant or renew licences under the Act;
- s46: Re standards for approval of licences;
- s47: Grounds for denial or non-renewal of licences
- s48: Re applications for licences
- s49: Re licence terms and conditions
- s52: Re suspension or cancellation of a licence, and s53 right of appeal;
- s54: Licence issued by an Administrator under an international agreement is deemed to be licensed under the Act;
- s55: (1) Register of rights and licences to be established. (2) Registration does not of itself constitute an access agreement, licence or right
- s56: Requirement to hold a licence or authorisation where one is required;
- s60 & 61: Re authorisation of transhipment at sea;
- s129:(1) Regulations power: including (a) requirements and processes for licensing and licences;

(e) implementing FMPs (s17); (i) procedures controlling the processes relating to

Access Agreements, licensing, tendering and trading of vessel days

Regs:

- Part 2: Division 2: Fisheries Licensing Committee
- Part 2: Division 3: Fisheries Appeals Committee
- s31: Permission to place a FAD (does not confer any exclusive right to fish near the FAD);
- Part 7: National Registers;
- s49: Fishing licence applications;
- s51: "The issuance of a licence to a person does not imply or confer any future right or privilege for that person to be issued a licence of the same type or any other type."
- s55: Re Suspension or cancellation of a licence or authorisation with notice;
- s56: Re Suspension or cancellation of a licence or authorisation without notice;
- s57: material changes since granting a licence;
- s58: Re Application for an authorisation to fish in the high seas;
- s59: Re Application to fish in areas beyond fisheries waters;
- s68: The Licensing Guidelines required under the Act are set out in Schedule 6 (sic. It is actually Schedule 5).

Transfer provisions:

Act:

- s21(2): Some aspects of customary rights may be transferable - "No person shall, without permission given by the relevant customary rights holders, use a vessel other than a vessel used for customary fishing, to (a) engage in fishing; (b) otherwise enter; or (c) directly or indirectly cause destruction to an area subject to customary rights.";
- s38(2)(b)(viii): Minister may attach conditions relating to transferability to rights granted to foreign fishing vessels;
- s42: (1) "The Minister may, by Regulation, establish tendering and trading processes for the allocation of vessel days to licensed foreign fishing vessels, consistent with a scheme or other measures taken under a relevant international agreement"; (2) "The trading of vessel days shall be subject to approval by the Director and payment of such fee as may be prescribed or the Director shall require by Order."
- s49(5) "A licence granted under this Act is not transferable, except as may be otherwise provided in a Fisheries Management Plain" (sic);
- s129(1) "The Minister may make regulations to carry out and give effect to this Act, including, without limitation (b) prescribing requirements, processes and other relevant matters for licensing and licenses within the scope of this Act; (e) implementing fisheries management plans prepared

Regs under section 17; (i) prescribing procedures controlling the processes relating to Access Agreements, licensing, tendering and trading of vessel days"

- s36: Particulars to be included in the national register of licences and authorisations do not include explicit reference to transfers;
- s38: National register containing information relating to Access Agreements and licences and authorisations under Part 6 of the Act does not specify inclusion of information relating to transfers

Notes:

Act:

- s43 does not appear to require Solomon Islands vessels to hold a licence for fishing in the fishery waters
- Not clear whether licences are granted to vessels or persons (e.g., see s46: "In granting or renewing licences under this Act, the Director, based on information and advice of the Fisheries Licensing Committee, shall take into account the extent to which the relevant State, operator, owner of the vessel or other relevant person or company, or the vessel, as appropriate, has...")

Regs:

- s57(1): contemplates that licensees could include corporations

FFA Member: Tonga

Legislation:

- Fisheries Management Act 2002

Source:

- Act: PACLII

Currency:

- Act: Replaced Fisheries Act 1989. MAFFF website does not appear to contain the Act

Instruments:

Act

- Participatory rights;
- Licence;
- Licence issued by an Administrator;
- Permit;
- Authorisation;
- Local fishing vessel licence;
- Commercial sport fishing licence;

- Locally based foreign fishing vessel licence;
- High seas fishing permit;
- Fishing gear licence;
- FAD licence;

Licence-related provisions:

Act

- s6. Participatory rights: does not define by Act
- s15(2). A licence, permit or authorisation may be issued for fishing or a related activity in a special management area, only in consultation with the relevant coastal community;
- s21(1). Fishing or related activity prohibited without, or in contravention of the conditions of, a licence, permit or other authorisation (some exceptions in s...);
- s22. Re Prescribed form for application of a licence, permit or authorisation;
- s23. Licences subject to conditions as provided for under the Act or as may be prescribed by the Minister or Secretary;
- s25. Fees are payable for a licence, permit or authorisation;
- s26(1). Licence, permit or authorisation valid for period stated on the licence, permit or authorisation (s37(2): foreign access agreement or arrangement valid for a max of 1 year; s42: foreign fishing vessel licence valid for no longer than the validity of the access agreement or arrangement);
- s27. Re cancellation or suspension of licences, permits or authorisations;
- s28. Re right of appeal against cancellation or suspension;
- 29. Local vessels (defined in s2(1)) require a local fishing vessel licence unless used solely for subsistence fishing (s29(4) implies that the licence is issued to a vessel, not a person);
- s30. Fishing vessels used for reward or hire for sport fishing require a commercial sport fishing vessel (defined in s2(1)) licence (s30(2): licence is issued to a vessel);
- s31. Locally based foreign fishing vessels (defined in s2(1)) require a locally based foreign fishing vessel licence (s31(3): licence is issued to the vessel);
- s37. Re access agreements & arrangements;
- s38. Foreign fishing vessels (defined in s2(1)) require a foreign fishing licence under s30 or under a foreign access agreement or arrangement (s38(3): licence is issued "in respect of of a foreign fishing vessel" - not clear whether the licence is issued to a person or a vessel);
- s39. Re fisheries management agreement and arrangements for, inter alia, (1)

(a) administration of a multilateral access agreement or arrangement, (b) harmonisation of licence terms and conditions of access and licensing procedures in respect of foreign fishing vessels;

- s41: Foreign fishing vessel licence issued by an Administrator under an access agreement or arrangement is deemed to be a licence under the Act;
- s45: Local fishing vessels and Tonga ships require a high seas fishing permit to fish on the high seas; (s46(c) implies the holder of the licence is a person)
- s46: Tongan subjects require an authorisation issued by relevant State to fish on high seas using a foreign fishing vessel, a locally based foreign fishing vessel or a vessel that is not registered under the Shipping Act for fishing (s47 re exemptions to s46);
- s50. re terms and conditions of high seas fishing permit;
- s51. high seas fishing permit valid for max 1 year;
- s53. holder of a high seas permit must notify of any change of maser, owner or charterer of the vessel to which the permit relates;
- s54. Re cancellation and suspension of a high seas fishing permit;
- s91(1). "Where a person is charged with having committed an offence involving an act for which a licence, permit or authorisation is required under this Act, the onus shall be on that person to prove that at the relevant time the requisite licence, permit or authorisation was held by that person." This implies that licences, permits and authorisations are held by persons;
- s101. re power to make regulations - including but not limited to (2) (a) licensing of any fishery;

(d) licensing of fishing gear; (e) licences for persons engaged in sport or recreational fishing; (k) prescribing the form of foreign fishing licences (not defined in act but likely refers to foreign fishing vessel licences rather than authorisations issued by another State to Tongan subjects or persons operating a Tongan vessel to fish on foreign waters (referred to in s66); (l) licensing and control of FADs and rights to fish aggregated by FADs; (v) prescribing different classes or types of licences, permits or authorisations and the type of fishing that may occur under them

Transfer provisions:

Act

- s26(2). "Except as may be prescribed in connection with any scheme for limiting fishing effort in any fishery or for the purposes of participatory rights, no licence issued in respect of any fishing vessel under this Act shall be transferable to any other vessel except with the written permission of the Secretary or, in the case of a foreign fishing licence the Minister."
- s53(1): "The holder of a high seas permit must notify the Secretary within 5 working days of any change of master, owner or charterer of the fishing vessel to which the permit relates." Which suggests that a high seas permit may

be transferred automatically if the master, owner or charterer who changes is the holder of the permit.

Notes:

Act

- s6(3). Participatory rights may only be determined in fisheries that have been designated as a fishery under s7.
- s7(2). Fishery management & development plans shall indicate, inter alia, the licensing, permitting, authorisation measures to be applied
- There is some ambiguity as to whether a licence, permit or authorisation is issued to a person or to a vessel.

FFA Member: Tuvalu

Legislation:

- Marine Resource Act 2006 (2008 Revised edition)
- Marine Resources Amendment Act 2012
- Conservation and Management Measures (PNA Third Implementing Arrangement) Regulations 2009

Source:

- Act: PACLII
- Regs: PACLII

Currency:

Act:

- Replaced the Fisheries Ordinance 1978, The Fisheries (Foreign Fishing Vessel) Reg 1982, and Foreign Fishing Vessels Licensing (US Treaty) Order 1987.
- Amended by the Marine Resource Amendment Act 2012.
- Also available at https://tuvalu-legislation.tv/cms/ Regs
- There are no other regs on Paclii that appear more recent than this

Instruments:

- Licence;
- Permit;
- Regional Access Licence;
- High Seas Fishing Permit;

- Foreign Waters Fishing Permit

Licence-related provisions:

Act

- s2 Licence means a permit; Permit means any permit or licence issued in accordance with this Act, and includes any terms and conditions attached thereto.
- s2 Regional Access Licence - issued to a vessel of any Party to a multilateral access agreement of fisheries management agreement.
- s5(2): Wide powers to (2) take measures; and (5) attach conditions to licences;
- s6: Power to approve and issue permits in accordance with this Act or any fisheries access agreement;
- s7(3): Power to declare a designated fishery;
- s8: Duty to prepare Fishery Management Plan for each designated fishery; FMP to (f) determine CMMs;
- s9: Re Scope of CMMs
- s13(1): Permit or licence required for domestic-based fishing, foreign fishing, commercial fishing, commercial pilot fishing, marine scientific research, related activities. Permit can be issued under the Act or by an Administrator under a multilateral access agreement;
- s13(3): Permit required for Tuvalu fishing vessels to fish on the high seas (and s15(3) establish a record of such permits) (also s35(1)(b): requirement that Tuvalu fishing vessels hold a licence to fish on the high seas);
- s13(4): Power to require Tuvalu fishing vessels fishing in waters of other states to hold a permit;
- s13(5): Subsistence fishing may be exempted from s13 (s14: Minister may require a permit for local vessels in the fishery waters subject to s13(5));
- s13(5A): Power to require permit for artisanal fishing;
- s16: Re permit applications;
- s18: Grounds for approval and denial of a permit;
- s18(5)(e): Permit cannot grant holder an exclusive right to fish in the fishery waters;
- s19(1): Vessel holding a licence issued by an Administrator deemed to hold a valid licence;
- s20: Re scope of permit terms and conditions;
- s22: Grounds for suspension, revocation or imposition of conditions or restrictions on a permit;
- s23(1): permits valid for up to one year and not beyond any relevant charter agreement or access agreement;
- s26: Power to establish a register of fishers and vessels undertaking an activity governed by the Act;

- s28: Requirement that foreign or domestic-based fishing vessels fish under an access agreement unless otherwise prescribed;
- s29(1): Access agreements valid for up to 3 years, renewable;
- s30: Access agreement minimum terms;
- s31: FMPs may include authority to allocate, issue or deny licences valid in the region;
- s38: Duty to establish a High Seas or Foreign Waters Fishing Vessel Register;
- s39: Grant of High Seas or Foreign Waters Fishing Permit;
- s40: Conditions and restriction on high seas or foreign water fishing permits;
- s41: (1) high seas or foreign water fishing permits valid for one year or as specified; (2) void if no longer Tuvalu flag;
- s42: Grounds for cancellation and suspension of a high seas or foreign waters fishing permit;
- s96: Regulations power, including (c) procedure for issuance of licences and permits Regs
- s5: Requirement to comply with licence conditions to fish in EEZ;

Transfer provisions:

Act

- s5(2): "The Minister may take such measures as he sees fit to ensure, through effective management, the long-term conservation and sustainable use of fisheries resources, for the full benefit of Tuvalu". Arguable that this provides scope to introduce a transfer scheme.
- s9: CMMs may include identified measures but not limited to those measures.
- s23(4): "A permit under this Act may be transferred with the approval of the Minister and endorsement on the permit, or in accordance with such further conditions as may be determined by Order of the Minister."

Regs

Notes:

- Note that Tuvalu's Licences Act provides for a fee to be charged for a commercial fisherman's licence ($100, according to a 2010 Order), which is listed in schedule 1 as a non-transferable licence. I suspect these are small scale fishing licences (artisanal?)
- http://www.paclii.org/tv/legis/consol_act_2008/la83/
- Regs give domestic effect to the PNA Third Implementing Arrangement, which includes licensing provisions

FFA Member: Vanuatu

Legislation:

- Fisheries Act 2014

Source:

FFA **Currency:** Act

- Also available at http://www.paclii.org/vu/legis/consol_act/fa110/.
- No other legislation more recent legislation on PACLII (last updated Feb 2017) or at https://parliament.gov.vu/index.php/icons/members-of-10th-legislature.

Instruments:

Act

- Licence;
- Fishing licence;
- Foreign fishing licence;
- International authorisation to fish;
- Local fishing licence;
- Authorisation;
- Fishing right
- Permit;
- Licence for use of a FAD;
- Rights to aggregated fish;

Licence-related provisions:

Act

- s1 either defines or refers to the instruments listed to the left;
- s10(2): Power to determine a designated fishery;
- s10(4): Duty to prepare a fisheries management plan for each designated fishery;
- s10(5): Power to make regs for designated fisheries;
- s11(2)(d): FMP must "(d) provide for a scheme of licensing, if necessary, or other appropriate management measure"; and "(e) specify, if applicable, the licensing regime to be applied, including the limitations, if any, to be applied to local fishing operations and the amount of fishing, if any, to be allocated to foreign fishing vessels".
- s35(1): Person operating a Vanuatu fishing vessel for commercial fishing must possess a local fishing licence (if wholly owned by Vanuatu citizen) or a foreign fishing licence;
- s36(1): Power to issue local fishing licence; (5) grounds for refusal;
- s42: Duty to record all fishing vessels flying Vanuatu flag that are authorised to fish pursuant to the Act outside Vanuatu waters;

- Part 9: Re authorisation to charter;
- s53(2): Foreign fishing vessel may fish in Vanuatu(b) in accordance with an access agreement or a licence issued under Part 10 (Foreign fishing vessels);
- s57(1): Power to enter into multilateral access agreements, which (2) may provide for, inter alia, fisheries access;
- s57(4): minimum terms and conditions of multilateral access agreements;
- s57(5): Multilateral access agreement may provide for inter alia (a) the issuing of licences for fishing and related activities; (b) an administrator to issue licences;
- s58: Power to enter into related agreements, which may specify, inter alia, (a) harmonised minimum terms and conditions for fisheries access;
- s59(1): Owner, agent or operator of a foreign fishing vessel must apply for a foreign fishing licence; (4) power to issue or refuse an application; (%) and (6): grounds for refusal, suspension or
- cancellation of a foreign fishing licence; (7) applications to be submitted to an administrator, if provided for in an access agreement;
- s60(1): Owner, agent or operator of a locally based foreign fishing vessel must apply for a locally based foreign fishing vessels licence; (3) power to issue or refuse a licence;
- s63: Power to give effect under Vanuatu law to international CMMs with respect to all Vanuatu- registered fishing vessels regardless of where they operate;
- s65: Owner, charterer or operator of a Vanuatu fishing vessel must apply for an international authorisation to fish beyond Vanuatu waters;
- s66: Power to grant international authorisation to fish;
- s67: Duty not to issue an international authorisation to fish under certain circumstances;
- s68(2): Power to attach conditions to an international authorisation including in relation to (c) the descriptions, quantities, size or presentation of fish that may be taken;
- s69: Authorisation valid for max 3 year, renewable, and only if the vessel is registered in Vanuatu;
- s70: Grounds for cancellation or suspension of authorisation; s72(1) Vanuatu citizen or corporation must have authorisation of flag state to use a non-Vanuatu vessel to fish on the high seas;
- s73(1): Vanuatu vessels must (a) have authorisation to fish in another state's waters, (b)/(c) in accordance with an agreement/ICMMs in waters subject to that agreement/ICMMs; on the high seas with an international authorisation;
- s74: Power to allocate fishing rights such as quotas to Vanuatu fishing vessels to fish beyond Vanuatu waters;

- s81: All licences & authorisations must be in prescribed form and is subject to any conditions in the Act and prescribed by regs, and any gazetted general conditions and any special conditions attached to a licence or authorisation any fisheries management plan;
- s83(1): Foreign fishing licence valid for up to 1 year or less if specified in a multilateral access agreement;
- s83(3): Local fishing licence valid for up to 1 year;
- s83(4): Transfers
- s84: Duty to refuse licences and international authorisations, including if (2)(b) "it is necessary to do so in order to give effect to any licensing programme specified in a fishery management plan";
- s87: Grounds for appeal against refusal suspension or cancellation if licence or authorisation;
- s88: Duty to maintain a register of licences and authorisations;
- s147:(1) Power to make regulations (broad), (2) including but not limited to (a) "prescribing measures for the conservation and management, development licensing and regulation of fisheries or a particular fishery"; (b) "licensing, authorisation or registration of any vessel or class or category of vessels to be used for fishing or related activities, or for any other purpose under this Act, including:...(iv) terms and conditions...relating to such licensing, authorisation or registration; (c) licensing, authorisation or registration of any fisherman or class of fisherman, fishing gear and other equipment or devices used for fishing;...(k) he licensing, control and use of fish aggregating devices, the rights to the aggregated fish and prescribing times for their use and distances from such devices that any vessel may fish;
- s148: Broad powers to make regs to enforce FMPs;
- s149(j) Specific powers to make regs to promote the effectiveness of ICMMs including a broad power to make regs "(j) providing for any other measures that may be agreed to by sub-regional regional or global fisheries organisations, or pursuant to a treaty or arrangement".

Transfer provisions:

Act

- s83(6): "A licence must not be transferred to any other vessel except with the written authority of the Director, unless otherwise provided under an applicable multilateral access agreement"

Notes:

Act

- Act includes provisions relating to aquaculture and aquaculture licensing. These are not included in this analysis.
- Licences are held by persons but appear to attach to a vessel

ANNEX IV. LIST OF INTERVIEW QUESTIONS

The following 14 questions were asked to interviewees:

(1) What do you know about transferability in fishing rights systems in various contexts?

(2) Do you think that the concept of transferability is well known or understood across the region? Who is likely to understand the concept well?

(3) What do you think would be the best way to build a better understanding of transferability, both for yourself and for your colleagues across the Pacific?

(4) How do you feel about increasing the transferability of tuna fishing access rights between companies or vessels within the purse seine or longline VDS?

(5) How do you feel about increasing the transferability of tuna fishing access rights between companies or vessels within longline fisheries that are outside of the VDS?

(6) What do you think would be the benefits to Pacific Island countries from increased transferability of tuna fishing access rights? Who would receive those benefits?

(7) What would be the cost implications? Who would bear those costs?

(8) What are the challenges that you can think of that would be associated with implementing greater transferability? This can include a lack of enabling conditions in the region, potential issues with enforcement and compliance, and the creation or utilization of regulatory loopholes.

(9) What would Pacific Island country governments need to do in order to introduce transferability between companies and vessels into the tuna fishing access rights they issue? What would regional agencies need to do?

(10) What sort of regulation or controls would be required to ensure ongoing ownership by Pacific SIDS over fishing rights and regional allocations?

(11) What questions do you have about transferability in Pacific Island tuna fisheries? What additional information would be helpful to you and your administration?

(12) Are there any other concerns you have about transferability of fishing access rights?

(13) Should Pacific Island countries pursue transferability in the tuna fishing access rights they issue?

(14) More broadly, what do you see as the biggest opportunity in the coming years for increased economic gains to Pacific Island countries from the region's tuna fisheries?

ENDNOTES

1. The four goals for tuna fisheries defined in the "Roadmap" include: sustainability, doubling the value of tuna catch, creating 18,000 new jobs for Pacific Island communities, and increasing the supply of tuna available for PICT domestic consumption. See: https://www.ffa.int/system/files/Roadmap_web_0.pdf.

2. A "fish stock" is an operational rather than biological term, defined by the United Nations Food and Agriculture Organization (FAO) as the living resources in the community or population from which catches are taken in a given fishery (where the fish stock may be one or several species of fish, and also includes commercial invertebrates and plants) (FAO Fisheries Glossary).

3. There is some overlap in species targeted between the tropical longline fishery and the southern longline fishery, in the latitudinal band from 0°– 20°S.

4. For useful overviews of earlier work, see FAO (Charles, 2009; Shotton, 2005).

5. Scott (2008) described characteristics of fishing rights, consistent with other descriptions (e.g. Grafton et al. 2000; Arnason, 2000), observed to contribute to increasing efficiency and hence economic outcomes from the fishery: (i) the exclusivity of the rights, i.e. the ability to keep others from using the right; (ii) the duration of the rights, i.e. the longer the time period of the right, the more value provided; (iii) the security of the rights, i.e. how likely it is that the owner of the right can hold onto it; and (iv) the transferability of the right, i.e. the extent to which it can be divided and traded to others.

6. SEASALT is a mnemonic based on 7 common attributed of rights-based management programs: Secure; Exclusive; All sources; Scaled; Accountable; Limited; Transferable.

7. Sterner (2003) writes that the theoretical foundation of characteristics of property rights in managing natural resource use and environmental externalities is Coase (1960), though such instruments are typically ascribed to Dales (1968a, 1968b).

8. See: https://www.wcpfc.int/convention-text.

9. The Palau Arrangement is an agreement between Parties, under the Nauru Agreement.

10. Though not necessarily including territorial and archipelagic waters.

11. The current rules of the purse seine VDS are described in the 2016 amendment to the Palau Arrangement, see: https://pnatuna.com/sites/default/files/PS_VDS%20Txt_Amended_Oct2016_0.pdf.

12. Of note, the VDS has been recognized at the regional level, as part of a CMM agreed at the WCPFC (PNAO 2015).

13. The current rules of the tropical longline VDS are described in the 2016 amendment to the Palau Arrangement, see: http://pnatuna.com/sites/default/files/LL_VDS%20Txt_Amended_Oct2016_3.pdf.

14. See: http://pnatuna.com for description of iFIMS. Data related to catch and vessel activity in particular EEZs can be viewed through iFIMS by individual PNA Parties.

15. Currently the agreement has been signed by Australia, the Cook Islands, Fiji, New Zealand, Niue, Samoa, the Solomon Islands, Tokelau, Tonga, Tuvalu, and Vanuatu.

16. See: https://www.ffa.int/tka_public.

17. See: https://www.ffa.int/system/files/Day1_CMSOverview.pdf, last accessed on July 25, 2019.

18. Of note, under a capacity management program (IATTC Resolution C-02-03), the Inter-American Tropical Tuna Commission has recognized concessions that effectively transfer states' use rights, linked to vessels (see: https://www.iattc.org/PDFFiles/Resolutions/IATTC/_English/C-02-03-Active_Capacity%20of%20the%20tuna%20fleet%20operating%20in%20the%20EPO.pdf).

19. In the absence of data to estimate differences in the price of days between EEZs, we used the price floor of $10,000/day across both the low and high productivity PICTs.

20. Fishing effort creep is defined here as increases in the productivity (fishing power) of nominal effort (e.g., as a result of investment that augments the capital stock, or through learning by doing and using), i.e., an increase in effective effort and fishing mortality (Squires et al. 2017).

21. Article three of the Convention states that the area covered by the treaty is the range considered sufficient to manage the discrete tuna stocks, defined as comprising "all waters of the Pacific Ocean bounded to the south and to the east by the following line: From the south coast of Australia due south along the 141° meridian of east longitude to its intersection with the 55° parallel of south latitude; thence due east along the 55° parallel of south latitude to its intersection with the 150° meridian of east longitude; thence due south along the 150° meridian of east longitude to its intersection with the 60° parallel of south latitude; thence due east along the 60° parallel of south latitude to its intersection with the 130° meridian of west longitude; thence due north along the 130° meridian of west longitude to its intersection with the 4° parallel of south latitude; thence due west along the 4° parallel of south latitude to its intersection with the 150° meridian of west longitude; thence due north along the 150° meridian of west longitude." See: https://www.wcpfc.int/doc/convention-conservation-and-management-highly-migratory-fish-stocks- western-and-central-pacific.

22. Fishing effort is a multidimensional variable, comprised of a number of components such as various capital stocks, labor, fuel or fishing time, skipper skill, etc. (Squires et al. 2017; Arnason et al. 2015).

23. See: https://www.wcpfc.int/convention-text.

24. See: https://www.wcpfc.int/conservation-and-management-measures.

25. The Palau Arrangement is an agreement between Parties, under the Nauru Agreement.

26. Though not necessarily including territorial and archipelagic waters.

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31. Currently the agreement has been signed by Australia, the Cook Islands, Fiji, New Zealand, Niue, Samoa, the Solomon Islands, Tokelau, Tonga, Tuvalu and Vanuatu.

32. See: https://www.ffa.int/tka_public.

33. See: https://www.ffa.int/system/files/Day1_CMSOverview.pdf, last accessed on July 25, 2019.

34. South Pacific Forum Fisheries Agency Convention.

35. The definition of fishing days in the VDS varies by vessel size. One fishing day is equal to 1.5 calendar days under the VDS scheme for vessels <50m, fishing days and calendar days are equal for vessels between 50 and 80m, and for vessels >80m one fishing day is equivalent to 0.5 calendar days.

36. USCG, 2019. Registered Dimensions Under Formal Systems. U.S. Coast Guard Marine Safety Center.

Nicholas Institute for Environmental Policy Solutions

The Nicholas Institute for Environmental Policy Solutions at Duke University is a nonpartisan institute founded in 2005 to help decision makers in government, the private sector, and the nonprofit community address critical environmental challenges. The Nicholas Institute responds to the demand for high-quality and timely data and acts as an "honest broker" in policy debates by convening and fostering open, ongoing dialogue between stakeholders on all sides of the issues and providing policy-relevant analysis based on academic research. The Nicholas Institute's leadership and staff leverage the broad expertise of Duke University as well as public and private partners worldwide. Since its inception, the Nicholas Institute has earned a distinguished reputation for its innovative approach to developing multilateral, nonpartisan, and economically viable solutions to pressing environmental challenges.

Contact

Nicholas Institute
Duke University
P.O. Box 90335
Durham, NC 27708

1201 Pennsylvania
Avenue NW
Suite 500
Washington, DC 20004

919.613.8709
nicholasinstitute@duke.edu