Received: 19 October 2019 | Revised: 4 February 2021 | Accepted: 5 February 2021

DOI: 10.1111/csp2.386

CONTRIBUTED PAPER

Conservation Science and Practice
A journal of the Society for Conservation Biology
Open Access

WILEY

Applying a jurisdictional approach to support sustainable seafood

John N. Kittinger[1,2,3] | Miranda Bernard[4] | Elena Finkbeiner[1] | Erin Murphy[4] | Pablo Obregon[1] | Dane H. Klinger[1,5] | Michael L. Schoon[2,6] | Kevin J. Dooley[7] | Leah R. Gerber[4]

[1]Conservation International, Center for Oceans, Honolulu, Hawaii

[2]Global Futures Laboratory & School of Sustainability, Arizona State University, Tempe, Arizona

[3]Conservation International, Betty and Gordon Moore Center for Science, Arlington, Virginia

[4]School of Life Sciences, Life Sciences Center, Arizona State University, Tempe, Arizona

[5]Harvard T. H. Chan School of Public Health, Harvard University, Boston, Massachusetts

[6]School of Sustainability, Arizona State University, Tempe, Arizona

[7]The Sustainability Consortium, Julie Ann Wrigley Global Institute of Sustainability, Arizona State University, Scottsdale, Arizona

Correspondence
John N. Kittinger, Conservation International, Center for Oceans, 3555 Harding Avenue, Suite 200, Honolulu, HI 96816.
Email: jkittinger@gmail.com

Abstract

Ensuring the security of ocean ecosystems that provide food and livelihood benefits from seafood systems requires significant investment in improving the sustainability of fisheries and aquaculture production at scale. Seafood certification and ratings systems have established strong benchmarks for sustainability, but markets need to incentivize sustainability throughout the value chain and at relevant ecological scales in order to generate meaningful conservation impacts and support lasting on-the-water stewardship efforts. Here, we propose that market-based approaches and ecosystem-based governance initiatives can be integrated to improve the sustainability of seafood production systems using a jurisdictional approach. Jurisdictional approaches are place-based initiatives deployed in key commodity producing regions to drive sustainability through aligned incentives among government, market, and producer actors. To explore the applicability of this approach in seafood, we first identify key mismatches in existing certification and ratings schemes that stymie the effectiveness of market-based approaches to drive ecosystem-scale impacts. Subsequently we identify the differentiated incentives for sustainability among producers, supply chain companies, and governments—drawing evidence from research and practice. Based on this analysis, we review the potential for jurisdictional approaches to align actors' incentives for sustainability at the scale of entire production geographies, bringing market-based approaches and governance improvements together to achieve conservation outcomes.

KEYWORDS

certification, ecosystem-based management, governance, jurisdictional approach, market incentives, ocean ecosystems, seafood, sustainability

1 | INTRODUCTION

The oceans are the world's largest food system, providing the primary source of animal protein for billions of people and supporting global food security, livelihoods, and economic development. In wild capture fisheries, overfishing, illegal fishing, and destructive harvesting practices threaten the productive capacity of oceans, resulting in lost revenue in the billions and reduced security for associated communities (CEA, 2015; Costello et al., 2016; World Bank Group, 2017). In the aquaculture sector, irresponsible practices can lead to destruction of coastal ecosystems, pollution and other threats, diminishing the ecological integrity of these habitats and placing at risk the income, food security, and well-being of communities (FAO, 2018).

In response to these threats, there has been significant investment in market-based solutions to incentivize sustainable production practices in fisheries and aquaculture. Market-based solutions comprise a wide array of approaches focused on generating incentives along the supply chain that favor sustainability (Jacquet et al., 2009; Sutton, 1998). Sustainability is determined through seafood certification and ratings systems, which are supported by their associated standards, benchmarking, and verification systems, and communicated to consumers and buyers via ecolabels, branding, marketing, and campaigns. Certification and ratings systems have widespread adoption among retailers in North America and Europe but have little uptake in the rest of world (CEA, 2017). This is largely due to the cost of certification schemes, the lack of market incentives for these approaches in many markets, and the lack of viability of current approaches in artisanal and small-scale (CEA, 2020). The diversity of competing standards has also led to coordination and alignment problems, limiting success of these market-based approaches in achieving policy reform and on-the-water conservation impacts (Osmundsen et al., 2020; Roheim, Bush, Asche, Sanchirico, & Uchida, 2018).

Concurrent with the development of market-based approaches for seafood sustainability, two decades of investment in research and practice on ecosystem-based management and natural capital theory and methods have aimed to protect nature at relevant social-ecological scales (Brugère, Aguilar-Manjarrez, Beveridge, & Soto, 2018; Kareiva, Tallis, Ricketts, Daily, & Polasky, 2011). These approaches are predicated on the notion of holistic management of a set of co-dependent habitats and species that comprise a functioning ecosystem, which supports human well-being. Financial and capital investments to deploy these approaches into ocean governance systems at scale have been significant (e.g., $1.4 billion USD has been invested into the Coral Triangle Initiative [WWF, 2020]). However, these ecosystem-based management approaches often have little to no links to seafood markets, focusing on improving governance of targeted species, habitats, and seascapes via policy reform, capacity development, and on-the-ground implementation.

Historically, the conservation movement has implemented market-based initiatives and ecosystem-based management approaches in isolation (Figure 1). A concerted effort to transform seafood markets toward ecosystem sustainability began after years of frustration with slow progress in policy improvements in fisheries (Sutton, 1998). Improvement efforts have since grown from isolated campaigns to comprehensive consumer and buyer engagement initiatives (Roheim et al., 2018). These campaigns have had notable success at shifting portions of the seafood sector towards more sustainable production practices (CEA, 2020; CRC, 2019), but there is mixed evidence about whether market-based approaches are having significant conservation impacts in the targeted ecosystems (i.e., key “production geographies”) (CEA, 2020; Selden, Valencia, Larsen, Cornejo-Donoso, & Wasserman, 2016). A recent, expansive evaluation of market-based strategies indicates that progress is being made in markets in North America, Europe, and Japan with increased and stronger buyer commitments, active pre-competitive dialogues among industry, and investment in initiatives and tools to drive accountability (Ross Strategic, 2020). However, business commitments vary greatly with respect to quality and public reporting on progress, and it remains difficult to determine what impact market-based approaches are having in ecosystems and communities, due to the complexity of seafood supply chains and because market-based initiatives may not take into account the incentives of producers and their production practices (Ross Strategic, 2020). Similarly, efforts to implement ecosystem-based management often fail to consider the critical role that markets play in shaping production practices and incentives, limiting the scalability and impact of these governance initiatives.

Here, we examine the intersection between market-based approaches and ecosystem-based management and explore how a jurisdictional approach offers solutions to drive effective stewardship of ocean ecosystems at scale. Jurisdictional approaches are place-based initiatives deployed in key commodity producing regions to drive sustainability (CI, 2018). These approaches bring together market incentives and policy reform efforts, and have been applied in terrestrial commodities. This model offers a new means of reconciling both the differentiated incentives and capabilities of actors in seafood production systems (industry, government, communities) and addresses ecological and geographical mismatches in current ratings and certification systems—offering opportunities to incorporate ecosystem-based management and market demand signals for sustainable production.

To set the stage for how the jurisdictional approach can be used to guide sustainable seafood production, we first identify key ecological and geographical mismatches

FIGURE 1 Reconciling the disconnect between market-based approaches and governance reform is needed to achieve sustainable production of ocean resources at scale. Significant resources have been put into initiatives to drive governance and policy improvements, with little engagement with markets. Similarly, the vast resources put into market-based approaches, including in developing business commitments and supply chain engagement, have had little engagement with policy and on-the-water producer communities

that stymie the effectiveness of current seafood sustainability standards, which are the foundation for market-based approaches. We then evaluate the interests of supply chain actors as well as governments and communities, identifying key incentives that may support effective governance and align market incentives to drive better performance across the sector. Drawing on these two analyses, we then explore the advantages of jurisdictional approaches in bringing together the best aspects of market-based incentives together with ecosystem-based governance reforms, taking into consideration incentives for implementation. We conclude with thoughts on how the jurisdictional approach can be piloted and scaled in the sustainable seafood movement to meet the challenges of the Anthropocene ocean, improving the impact and effectiveness of sustainability initiatives for seafood production.

2 | MISMATCHES IN SEAFOOD SUSTAINABILITY STANDARDS

Market-based approaches in the seafood sector arose in the late 1990s, focusing largely on driving the adoption of voluntary commitments by large-scale buyers of seafood. These commitments often focus on requirements for products to meet sustainability standards encompassed in seafood ratings and certification schemes (Sutton, 1998). This effort has proliferated over the past two decades (CEA, 2020), supported by a range of other market-based tools and programs (Jacquet et al., 2009; Ross Strategic, 2020). As a result, the majority of North American and European retailers, food service companies, and other major seafood buyers established sustainability commitments (CEA, 2017), adopting seafood sustainability standards that guide sourcing and purchasing policy, as well as verification and traceability. As food manufacturers, retailers, and restaurants have increased their demand for sustainable seafood, consumers have also been increasingly engaged through education and awareness, shifting demand toward sustainability (Gutierrez & Thornton, 2014).

Although business commitments and increases in certification of fisheries and aquaculture farms reflect important progress within the industry, market-focused interventions alone have proven insufficient to solve the larger challenges of sustainability. A recent global benchmarking of the seafood sector shows that the majority of seafood remains uncertified or not in improvement (CRC, 2019). Additionally, existing certification and ratings systems have been slow to adapt to changing issues in the sector including social responsibility (Kittinger et al., 2017). From an ecological perspective, the vast majority of sustainability standards focus at the level of individual fisheries or aquaculture farms, creating two problems of scale mismatch. The first is the scope of what the certification covers, which primarily focuses on the targeted resource rather than the full suite of ecological interactions and natural capital necessary to support sustainable production (ecological mismatch). The second issue is the mismatch between the certified fishery or farm and the biogeographical scale of the targeted resource and the ecosystem it occupies (geographical mismatch). These scale issues can be problematic insofar as certified farms or fisheries are embedded in a wider seascape of harvesting, most of which is not certified and performs sub-optimally.

2.1 | Ecological mismatch

Over the last few decades, there has been considerable investment in implementing ecosystem-based management in aquaculture and fisheries. The FAO describes the "ecosystem approach to aquaculture" as a strategy for managing aquaculture "within the wider ecosystem" to promote "sustainable development, equity, and resilience of interlinked social and ecological systems" (Soto, Aguilar-Manjarrez, & Hishamunda, 2008). In wild capture fisheries, ecosystem-based management accounts for trophic interactions, habitat function, and the impacts of fishing on non-target species (Pikitch et al., 2004). Under this approach, a comprehensive set of key ecological processes must be maintained in order to protect the functional integrity of the ecosystem and the benefits that flow to people from targeted species. Natural capital theory, which focuses on quantifying stocks of ecosystem resources and their value, has also been employed to offer a practical lens for better operationalizing ecosystem-based management approaches. A recent review of ecosystem-based approaches in fisheries concludes that incorporating certain context-specific considerations, such as explicit goals as well as social and environmental considerations relevant to fisheries management, is more realistic and practical within a production geography (Trochta et al., 2018).

One way to evaluate the potential relevance of ecosystem-based approaches and natural capital theory to market-based approaches is to examine the extent to which existing seafood sustainability standards incorporate this theory into their approach. Murphy et al. (in review) reviewed a range of wild-caught seafood certifications against the Millennium Ecosystem Assessment (MA) typology for ecosystem services (regulating, provisioning, supporting, and cultural). This analysis showed that while a sub-set of fishery certifications address some ecosystem services, the full scope of marine natural capital is not adequately considered. Most fishery certifications and their associated standards incorporate criteria that, if implemented, protect key provisioning and supporting services. The biggest gap in these standards are the lack of specific criteria to protect key regulating (e.g., water purification or water regulation) and cultural services (e.g., recreation and tourism, or aesthetic values) that healthy ocean and coastal ecosystems provide, which are often based on a complex set of socioeconomic and cultural values that vary depending on geography and context. Thus, while there is significant consideration of the services provided by the stock species in existing seafood certification programs, a failure to consider the comprehensive set of ecosystem functions relevant to maintaining the health of ocean ecosystems may limit the impact of certification. For example, fisheries certifications can be inconsistent between reviewers due to the ambiguity of criteria and metrics for habitat and ecosystem protections (Ward, 2008). Additionally, a recent study that evaluated the application of an Ecosystem Based Fisheries Management-bioregional approach also identified key issues with the MSC standard for data-limited and multispecies fisheries (Bellchambers, Gaughan, Wise, Jackson, & Fletcher, 2016). While there is broad agreement on the need to protect key ecological functions and services, it remains to be seen whether fully incorporating natural capital theory into seafood sustainability standards would produce significantly better conservation outcomes.

2.2 | Geographical mismatch

In addition to ecological mismatches, three geographical mismatches exist that may reduce the effectiveness of market-based sustainability incentives, including spatial, life history, and multi-species mismatches. First, seafood certification is typically done at the fishery or farm level, yet the biogeographical range of the target species can often extend far beyond the scale of an individual fishery or farm. If sustainable fishing practices are not employed across the entirety of the biogeographical range of the target species, then market-based incentives cannot ensure sustainability at the appropriate geographical scale. For example, many tuna fishery improvement projects that are seeking MSC certification focus on a single fleet or a single fishing area, rather than the full stock of tuna species, leading to a situation where only a portion of the fleet targeting the stock is engaged in sustainable practices. This can dilute the benefits of these practices for producers and create adoption barriers if costs of adoption outweigh the benefits. Similarly, while certification of individual farms in a region may reduce site-level mangrove deforestation and result in some improved environmental outcomes, the larger mangrove forest and ecosystem may still be at risk of harm from non-certified farms. Scaling reductions in deforestation and improvements in environmental performance to entire ecosystems is critical for long-term sustainability.

In addition to this spatial issue, many certification schemes may fail to protect targeted species throughout their life history stages. This is particularly the case for species with large migration routes, where spawning, juvenile, and maturing fish occupy distinct ecosystems. If critical habitats for life history stages, such as reefs or mangroves, are not protected across the biogeographical region of interest then target species may not be adequately protected. For instance, catch declines in coastal

Brazilian fisheries over the last few decades have fueled calls for long-term management plans that consider the entire lifecycle of targeted species, recognizing that if the estuaries that juvenile populations inhabit remain unprotected, management of adult populations will have little impact (Saint-Paul & Barletta, 2010).

Last, within a geographical region, there may be multiple fisheries targeting different species. Market-based incentives have historically acted at the level of single-species certification. However, even if one stock species is fully certified, an ecosystem's core functions may not be protected if other species are not. Considering how interactions between different species (both targeted and non-targeted) influence sustainability requires more data and greater understanding of ecosystem dynamics but remains critical for achieving sustainability goals (Micheli et al., 2014).

3 | DIFFERENTIATED INCENTIVIZES FOR SUSTAINABLE PRODUCTION

In this section, we explore the differentiated interests, incentives, and roles for industry, governments, and producer communities to pursue sustainability. We focus on motivating factors for each set of actors (industry, governments, and producer communities) to adopt sustainability initiatives, with a focus on areas of alignment as well as differentiated risks and rewards for adoption and long-term success. These incentives are key for the adoption of conservation measures that protect key production ecosystems, as well as the benefits they provide to supply chain actors and other beneficiaries. The purpose of elucidating these incentives is to illustrate how the jurisdictional approach can be applied to seafood production systems at relevant social and ecological scales to produce conservation impacts for a wide array of stakeholders.

3.1 | Industry incentives

In seafood production systems, the industry consists of a diverse set of private-sector actors and stakeholder groups including producers, traders, processors, buyers, and retailers (Grafeld, Oleson, Teneva, & Kittinger, 2017). Implementing sustainability initiatives in seafood supply chains can generate three types of incentives among these stakeholders, including upstream, operational, and downstream benefits (Yan, Yang, & Dooley, 2017).

Upstream benefits primarily take the form of increased or secure access to markets for producers. Sustainable practices may be required, for example, for fishers to sell their products into certain market channels, particularly for buyers that have clear requirements for sustainability in their sourcing policies and buyer commitments. These incentives often are not restricted to producers and are relevant to traders, middlemen, processors, and other supply chain actors. Upstream incentives can also be driven through governance and policy. For example, fishers' licenses to operate within a production geography may be conditioned on compliance with specific regulatory requirements. Licensing requirements for fishing vessels often carry mandatory catch reporting requirements for both targeted species and by-catch (e.g., NOAA, 2019). Likewise, in fish processing and packaging, regulations may require harvesters and processors to protect worker health and safety within their production facilities.

Operational benefits take the form of cost and productivity gains from greater efficiency and innovation. Both theoretical (Porter & van der Linde, 1995) and empirical studies (Berchicci & King, 2007) have shown that implementation of sustainable practices can provide benefits to a company's products and processes in terms of cost reduction, efficiency, productivity, and innovation. These benefits can accrue whether the implementation is due to compliance with legal regulation or voluntary commitments to adhere to a sustainability standard. Imperfect and asymmetric information coupled with the desire to create differentiation inevitably leads some companies to go "beyond compliance" and seek super-normal returns from their investment in more sustainable practices. Operational benefits can also be associated with reduced supply chain risks, including reducing a buyer's ability to source adequately (e.g., for there to be sufficient fish stock levels to meet demand). For large-scale buyers, this risk is particularly relevant if they sell large volumes of commodity seafood (e.g., whitefish, shrimp, tuna, and salmon) and must source this product from a variety of production geographies.

From a producer standpoint, the supply risk can look different and often focuses on the upstream benefit of market access, which can be conditioned on meeting sustainability requirements (Sampson et al., 2015). Consider, for example, the operational benefits that a harvester may observe if they were to be compliant with the FAO Code of Conduct (CoC) for Responsible Fisheries (FAO, 1995). The FAO CoC is one of the longest standing and broadly adopted voluntary standards. Compliance with the standard requires the harvester to ensure that the interests of local, small-scale and artisanal fishers be taken into account. This requires adoption of co-management practices, which should yield more effective decision-making around regional investments (Costanza et al., 1998). Similarly, the standard could require harvesters to comply with MARPOL 73/78, which is designed to prevent waste and pollution from vessels into the environment. Compliance might involve taking an operational waste product and finding economic value from recycling or selling it as feedstock to another business, yielding a net-positive economic return. More generally, these regulatory and voluntary standards require data to demonstrate compliance; adoption will improve the firm's performance with respect to data-based decision making and continuous improvement (Porter & van der Linde, 1995).

Finally, downstream benefits include marketing and price incentives in consumer markets, as well as reduction of reputational risks associated with poor performance. Market-based approaches operate under a general theory of change that focuses on generating demand signals for sustainable seafood along the supply chain, primarily among large seafood buyers (retailers, food service companies, and restaurant conglomerates). These buyers are incentivized to make voluntary commitments to sustainability in order to meet a changing consumer dynamic that increasingly favors sustainability and responsible production practices (Gutierrez & Thornton, 2014). This creates marketing and branding opportunities and can reduce reputational risk associated with the publicization of poor practices. Direct downstream incentives can include price premiums, access to niche consumer markets, and co-marketing opportunities. Evidence of price premiums is mixed, with little evidence that this is a primary motivating incentive for private sector partners (e.g., Arton, Leiman, Petrokofsky, Toonen, & Longo, 2020; Asche & Bronnmann, 2017; Cochrane, 2018; Lim, Hu, & Nayga Jr, 2018; Roheim & Zhang, 2018; Stemle, Uchida, & Roheim, 2016). Rather, manufacturers of fish-based products and retailers may be driven to adopt sustainable practices because of a broader strategy where sustainability is a key part of their brand strategy (Kumar & Christodoulopoulou, 2014). Maintaining market access can be a strong motivator for producers and distributors and is often generated as a result of voluntary commitments as well as regulatory requirements (Jolly, 2013).

3.2 | Role of governments and communities

Governments and communities play consequential roles in the seafood system and have different incentives and roles with respect to their engagement in sustainability initiatives. The fundamental role of government is to provide for the security and prosperity of its citizenry, increasing social benefits and long-term socioeconomic security. Governments therefore have a responsibility to develop and maintain the governance systems and institutions that provide for equitable long-term societal benefit of their populations. Governments primarily have a regulatory role: they set and enforce the rules, which can include constitutional rules (rules for how to make rules), legal and regulatory regimes (laws and statutes), and policies that operationalize these legal regimes. In general terms, the laws and policies that governments develop, as well as associated institutional systems and administrative units, have a profound ability to unilaterally affect markets and the actors engaged with them. For example, seafood trade policies that govern the import and export of seafood can profoundly affect how markets are structured (Bellmann, Tipping, & Sumaila, 2016). Similarly, governmental subsidy programs can change the fundamental economic thesis for harvesting (Sala et al., 2018; Sumaila et al., 2010). Bans on commercial use of species can affect who can fish for what and whether they can sell it formally into markets (e.g., Birkeland, 2017). Governmental fiscal and tax policy can also impact incentives for sustainability initiatives. For example, governments may implement fiscal policies to encourage capital development, often in the form of investor-friendly tax incentives that encourage investment in production sectors.

Communities are often incentivized through upstream benefits, including securing or maintaining access rights to production systems and associated markets (local, regional, or export). Among producers, incentives can also be tied to important sociocultural dimensions including traditional production methods, cultural practices, and other social factors that may or may not align with economic incentives (Cinner, Marnane, McClanahan, Clark, & Ben, 2005; Pollnac, 1988). With the expansion of global demand for seafood, producer communities must navigate a complicated landscape of market dynamics that often presents challenges for social capacity, governance systems, and the sustainability of marine ecosystems (Berkes et al., 2006). This can shift incentive structures and often can overwhelm local institutions that were developed under different conditions of resource use (Cinner, Sutton, & Bond, 2007).

4 | APPLYING THE JURISDICTIONAL APPROACH TO SUSTAINABLE SEAFOOD

As discussed above, market-based approaches and ecosystem-based management for fisheries and aquaculture have delivered some significant conservation outcomes but face key challenges that limit their effectiveness and ability to scale, including ecological and geographic mismatches and a complex landscape of incentives. While significant resources have been invested in driving the improvement of governance systems and policy for seafood production, this is often undertaken with little connection to markets (Figure 1). These challenges, the complexity of the sector, and the global escalation of climate change and other threats demand new approaches that can help deliver long-term conservation outcomes at scale.

The jurisdictional approach offers a promising model to address key barriers to sustainability. Below we discuss the potential advantages of jurisdictional approaches in bringing together the best aspects of market-based initiatives together with governance reform to achieve ecosystem-based management. This approach has been utilized in other commodities and offers a model for driving sustainable seafood production practices at scales relevant to the ecological footprint of resources and the governance systems that are key to managing their perpetuation. Drawing on current experiences and practice in seafood and other commodities, we discuss incentives for the adoption of this approach, and suggest ways in which current ratings and certification systems can evolve to integrate this approach. Last, we articulate an agenda for research and practice to carry these innovations forward.

4.1 | The jurisdictional approach

The jurisdictional approach is defined as "*an integrated landscape (and seascape) approach that aims to reconcile competing social, economic and environmental objectives through participation across stakeholders and sectors, implemented within governmental administrative boundaries, and with a form of government involvement*" (CI, 2018). These initiatives seek to improve social, environmental, and production practices in a focused effort in a production geography (the "jurisdiction") in a manner that can be recognized and preferentially sourced or priced within commodity markets (Figure 2). Market recognition is vital during the early stages of the initiative to ensure long-term traction and success. Mechanisms have been developed to transparently report progress towards a project's end goals (e.g., the Landscape Assessment Framework, the Sustainable Landscape Rating Tool). These mechanisms can help signal to the market that a jurisdiction is in the process of improvement and would

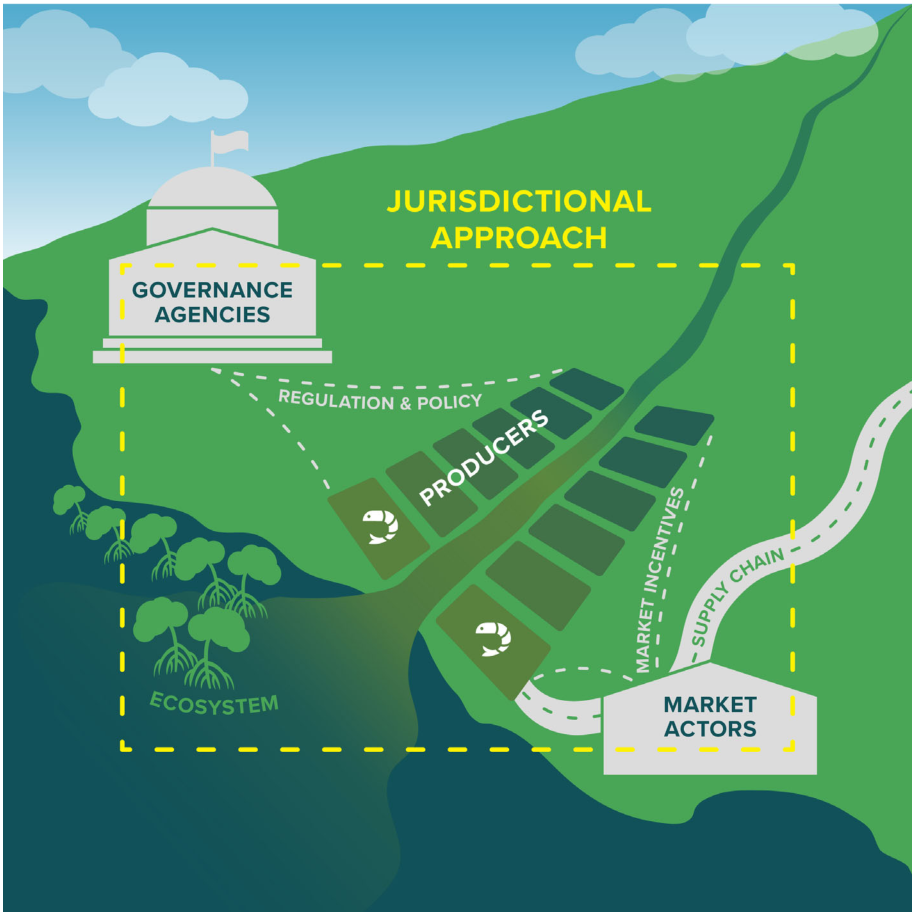

FIGURE 2 The jurisdictional approach focuses on a specific targeted geography, where governance improvements and market incentives are combined to drive the adoption of sustainable production practices. The scale of the jurisdiction has to take into account key ecosystem dynamics, as well as the socioeconomic dynamics of producers and market actors, and juridical authorities for relevant governing agencies

benefit from interim support, even if production has not yet reached improvement targets (Stickler et al., 2018). Longer-term credibility can be developed in multiple ways, including adoption of and auditing against international sustainability standards or locally developed standards that are benchmarked against international standards (Lambin & Thorlakson, 2018; Pacheco, Hospes, & Dermawan, 2017).

To date, the jurisdictional approach has largely been employed in agricultural commodity sectors that have been implicated in deforestation. Projects to eliminate deforestation on individual farms were seen as unscalable, especially without effective government regulation, leading to a recognition of the need to engage producers, stakeholders, and government at a larger scale (Boyd et al., 2018; Pacheco et al., 2020). Examples include ongoing initiatives in Mato Grosso, Brazil focused on large-scale agriculture and cattle farming, in Central Kalimantan, Indonesia focused on large-scale and smallholder agriculture and commercial forestry (Irawan, Widiastomo, Tacconi, Watts, & Steni, 2019), and in Acre, Brazil focused on large-scale and smallholder cattle farming (EII, 2017). Initiatives in agriculture are still relatively new and expanding. As such, there is not yet a knowledge base or track record to evaluate performance with respect to economic and environmental improvements (Garrett et al., 2019). Currently, these initiatives appear to require a multi-year timeline to develop, and require strong commitments from governments and stakeholders (Boyd et al., 2018).

4.2 | Addressing mismatches

The jurisdictional approach presents a compelling model to scale sustainable practices in seafood sectors. This approach can address key mismatches in current seafood sustainability certifications (Table 1). For example, by focusing on an entire production geography (Figure 2), these initiatives are more likely to protect key habitat functions and trophic interactions, as well as life history stages critical to targeted species (Table 1). The model offers the potential to integrate key ecosystem protections as well as sustainable production practices at relevant social and ecological scales, while also incorporating key incentives relevant to private sector, governmental, and community stakeholders.

TABLE 1 Approaches to address ecological and geographical mismatches in seafood sustainability certifications via the jurisdictional approach

Single-species and single-farm fishery certification mismatches	How the jurisdictional approach (JA) can address mismatches
Ecological	
Single-species and single-farm certifications may not protect all trophic interactions and key habitat functions	By focusing on a defined ecosystem at relevant biological and ecological scales, JA projects are more likely to recognize and address key habitat functions and trophic interactions (Boyd et al., 2018; CI, 2018).
Ecological criteria are written to maintain stock health and may fail to consider the entirety of ecosystem services that may be impacted by fishing or seafood farming	By focusing on a well-defined geography at relevant ecosystem scales, JA projects are more likely to recognize and invest in conservation measures that support the full suite of ecosystem functions in that geography (Boyd et al., 2018, CI, 2018).
Geographical	
Area of certification does not cover the full spatial extent of the population being fished or ecosystem in which farming occurs.	JA projects are focused on a defined jurisdiction that includes relevant environmental, political, industry, finance, and social considerations (CI, 2018), which would enable the defined territory to match the spatial extent of target population or ecosystem.
Area of certification may not cover the complete range of the species across its lifecycle (e.g., larval to juvenile to adult)	JA projects are focused on a defined jurisdiction that includes relevant environmental, political, industry, finance, and social considerations (CI, 2018), which would enable the defined territory to match the full range of the target species across its lifecycle.
Single farm or single fishery certifications may not consider spatial interactions that are key to sustainability (e.g., among inter-dependent fisheries or multiple fleets harvesting a single stock, or aquaculture farms in a watershed or waterbody that rely on shared resources such as water)	By focusing on a defined production geography, JA projects are better able to coordinate amongst multiple economic sectors or entities that might overlap or interact with each other (Boyd et al., 2018, CI, 2018). For example, terrestrial JA projects focused on preventing deforestation of regional forests by working to coordinate amongst multiple producers and production types (Stickler et al., 2018).

There are several initiatives that are being applied in fisheries and aquaculture in specific geographies and at the scale of entire production systems, which incorporate elements of the jurisdictional approach (Figure 3). Regional fishery management (RFM) initiatives in the Pacific Islands region, Alaska, Iceland, Australia, Ireland, and other geographies have achieved success in establishing stronger management systems that have supported healthier fish stocks and ocean ecosystems (Worm et al., 2009), while also harnessing the power of markets to drive socioeconomic benefits (Bellchambers et al., 2016; Kumar & Christodoulopoulou, 2014). These RFM models, which carry many of the attributes of the jurisdictional approach have several key elements in common, including engaging at the appropriate scale to manage the fisheries ecosystem, effective utilization and activation of market levers, and an investment in regulatory and policy reform.

In the Pacific Islands region, the Parties to the Nauru Agreement (PNA) include eight Pacific Island Countries which cooperatively manage the highly migratory tuna resources of the Western and Central Pacific Ocean (Figure 4). The PNA has implemented a set of effective management measures restrict fishing effort to sustainable limits, and mitigate harm to non-targeted species and ocean ecosystems (Aqorau, 2009). The PNA countries have also actively pursued market-based approaches, including achieving MSC-certification and creating commercial partnerships to drive value creation and further support for improved management of PNA tuna. The PNA has invested heavily in integrated efforts to implement effective governance systems, together with market-based

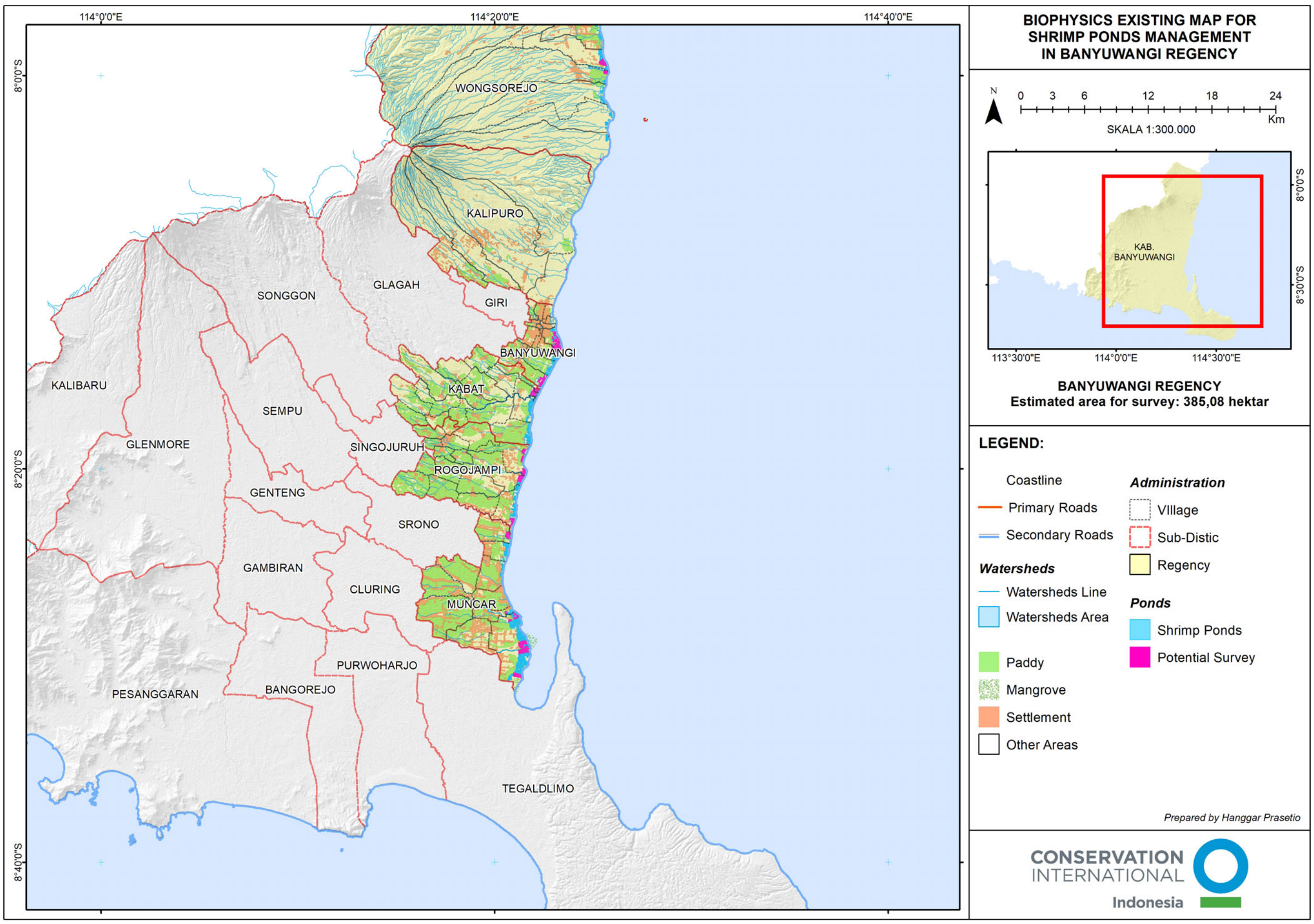

FIGURE 3 A jurisdictional approach for aquaculture in Banyuwangi, East Java, Indonesia. The Shrimp Improvement Program initiative is based in the Banyuwangi Regency, and focuses on enabling farms across the region to improve shrimp farm performance to match international environmental and social standards. Numerous aquaculture farms occupy multiple watersheds in the project region, resulting in these farms being ecologically connected through shared water resources and dependent on a range of ecosystem services. Disease outbreaks, pollution problems, and other unsustainable practices represent shared threats that require farmers to work together in order to reduce risk. A jurisdictional approach initiative is currently underway in this area to incentivize the adoption of responsible practices through a zonal management approach, implemented collaboratively by producers, government, supply chain companies, and nonprofit organizations

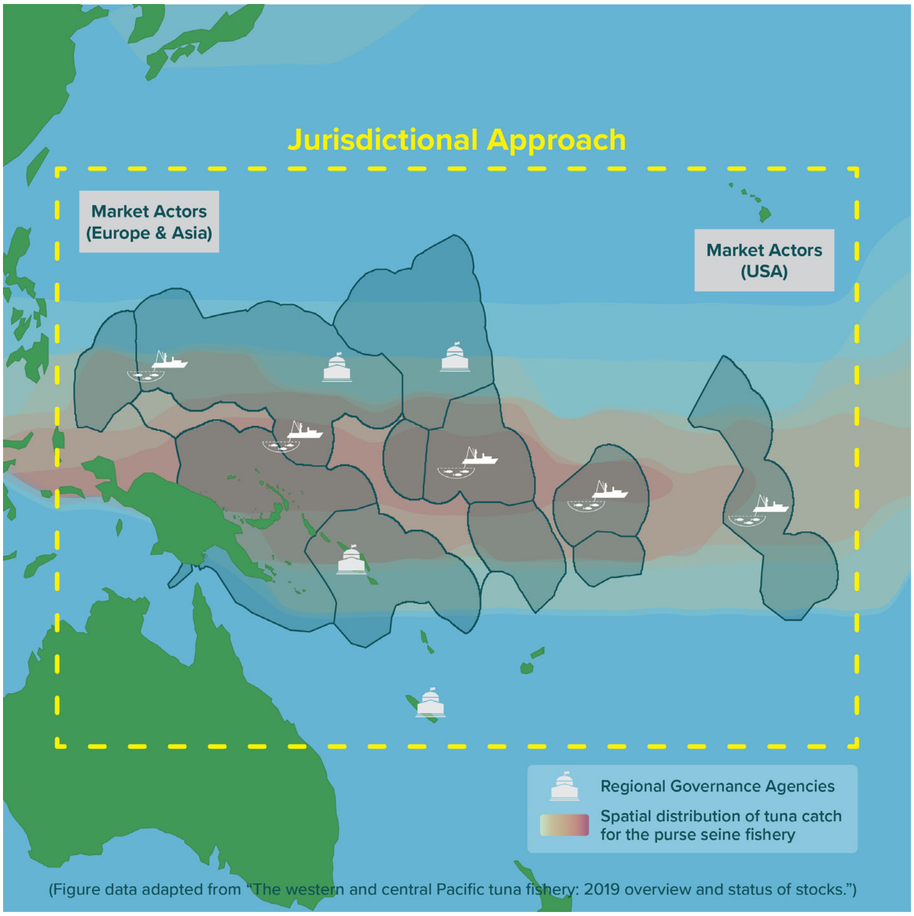

FIGURE 4 A jurisdictional approach for fisheries exists in the tuna fisheries managed collectively by the Parties to the Nauru Agreement (PNA) countries. The Pacific Island countries worked together to develop and implement the PNA Vessel Day Scheme to collectively manage a purse seine tuna fishery that accounts for over half of tuna catches in the Western and Central Pacific Ocean, and about one-third of global tuna catches. The multi-national management authority established for the region collectively sets rules for the fishery (79% of the total WCPO skipjack catch in 2017). As a result, the stock status of the four main commercial tuna species (skipjack, yellowfin, bigeye, and albacore) in the Western and Central Pacific Ocean is one of the most sustainable on the planet (Brouwer et al., 2018; ISSF, 2019)

approaches within a politically and ecologically-defined jurisdiction.

Applying the jurisdictional approach to seafood will carry some challenges unique to marine resources. Fisheries resources, for example, are subject to collective action dilemmas in which a given governance regime may be too small (problems with geographical scope) to manage the resources without leakage outside of a given jurisdiction (Young, 2002). This can be addressed by matching the scale of the institution to the distribution of the key resource, as has been done in the Pacific tuna purse seine fishery through the PNA's managed access system. However, this scale-matching is relatively rare, and can present a major challenge in applying the jurisdictional approach. This is particularly true for highly migratory fish stocks like tuna that span national jurisdictions and are currently managed by multinational institutions (Schlager, Blomquist, & Tang, 1994), or for species whose life history stages are complex and require governance systems that involve multiple institutions across different jurisdictions to collaborate effectively (e.g., salmon).

Additional challenges which apply include lack of stakeholder capacity and buy-in, alignment among governance and market partners, and inclusion of local stakeholders—these challenges are often a focal point for designing and effectively implementing these approaches by partners (EII, 2017). The successes of the PNA can be attributed to a number of reasons, including key regional leadership, innovation, shared interests and pragmatism which enabled PNA member countries to overcome the collective action dilemma (Aqorau, 2009; Aqorau, 2019; Yeeting, Weikard, Bailey, Ram-Bidesi, & Bush, 2018). The concentration of around 60% of the Western and Central Pacific Ocean tuna catch within the collective sovereign waters of the PNA countries has also provided these countries with considerable leverage to influence industry and the complex regional decision-making processes (Figure 4).

4.3 | Incentives for adoption and implementation

Effective implementation of a jurisdictional approach in seafood production systems will require an assessment of the types of engagements that are required among private sector actors and governments, as well as the incentive structures for these entities to meaningfully engage. Jurisdictional approaches are typically focused on specific regions that are determined by the political scale at which critical governance decisions are made, aligning diverse set of stakeholders (e.g., government, businesses, NGOs, and others) around common goals of economic development, supply chain stability, and improved environmental performance.

For governments, matching the scale of the initiative to the appropriate scale for policy implementation is key. Ideally the initiative is scoped so that the issues of geographic and ecological mismatch are resolved (Figures 2 and 3). Defining the appropriate ecological scale for the focal production geography as well as the appropriate governance scale (local, regional, national, and international) is therefore critical. For example, in fisheries there is increased interest in national-scale fisheries improvement projects, where governments and their partners identify and implement national-scale policy changes together with incentives from the private sector as well as support from nonprofit organizations (e.g., SFP, 2019). Another emerging approach is the notion of a verified sourcing area, an area-based mechanism that connects an entire production area to global markets to accelerate production and uptake of sustainable commodities globally (IDH, 2019).

Jurisdictional approaches can also reduce risk for buyers and other supply chain actors. Securing supply remains a critical focus for major seafood buyers and aligning improvements at the scale of an entire production geography may reduce this key operational risk. Business actors may also benefit from downstream incentives, as seafood from sustainable jurisdictions is likely to be more desirable to buyers and consumers. Jurisdictional improvements tend to also result in enhanced fiscal, environmental, and social performance of the sector. By focusing on whole jurisdictions instead of individual producers, these initiatives also have the potential to quickly grow the scale and scope of projects and engage producers of all sizes.

For example, the achievement of MSC certification for the PNA skipjack purse-seine fishery across the entire jurisdiction of PNA-member countries is a prime example of a jurisdictional approach (Figure 4). This initiative highlights the comparative advantages of a the jurisdictional approach in catalyzing fisheries sustainability and profitability, relative to individual market- or policy-focused approaches. Due in part to the significant successes of the PNA as well as the reliance of Pacific Island countries on their tuna fisheries, there is a continued desire among governments and regional authorities to further improve the environmental and socio-economic performance of their tuna fisheries (SPC and FFA, 2010). This regional-level jurisdictional approach includes agreed-upon high-level goals for both environmental and social improvements. The regional aspirations of Pacific Island Nations for higher performing tuna fisheries, coupled with a need to reduce supply-chain risks for major seafood buyers, have created an enabling environment to drive more environmentally sustainable and socially responsible practices at the scale of an entire production geography (Aqorau, Bell, & Kittinger, 2018).

Similarly, the Shrimp Improvement Program in Banyuwangi, East Java, Indonesia utilizes a jurisdictional approach in the Banyuwangi Regency to enable farms across the region to improve shrimp farm performance to match international environmental and social standards (Figure 3, The FishSite, 2019).

4.4 | An agenda for research and practice

The jurisdictional approach is a relatively new model for conservation in practice and will require significant prototyping and evaluation to effectively harness market incentives and governance improvements to drive sustainable ocean production at the ecosystem scale. Therefore, there is a strong need to continue to evaluate existing approaches in order to inform implementation efforts in the seafood space. This includes evaluating efforts in other commodities (i.e., agriculture) and calibrating these approaches to account for the significant differences between marine environments and terrestrial production systems.

There are several research and practice fronts that may prove valuable in helping understand the potential of the jurisdictional approach. First, the existing landscape of certification, ratings, and assurance programs remains complicated for the business community to navigate (Lambin & Thorlakson, 2018; Roheim et al., 2018), and are challenged by mismatches in scale that present problems for long-term sustainability. A deeper understanding about how existing certifying bodies and their standards can engage with production geographies via the jurisdictional approach remains a key research gap that can inform practical application. Understandably, most international sustainability standards are not calibrated to the nuances of issues at the level of a production geography—these standards must be applicable to a broad range of geographies and production practices. However, many of these standards carry significant market recognition. Targeted research can help to delineate how existing certifications, ratings, and assurance systems can be integrated into jurisdictional approaches in order to harness incentives for private sector actors, as well as the ways in which these standards can inform meaningful policy improvements that are relevant to the scale and production geography for a given initiative.

Second, understanding how markets will react to these approaches will help determine the scalability of the approach. This includes consideration of how jurisdictional approaches can address and effectively incorporate upstream, operational, and downstream incentives. There are several practical research challenges that could be addressed in this sphere, including understanding the extent to which this approach can help differentiate a production geography in the marketplace, the key operational efficiencies and risk reduction incentives that might be gained through implementation, and the financial and sociocultural incentives at the producer-level that will drive participation and adoption.

The development and implementation of jurisdictional approach initiatives that take into account the scales, challenges, and nuances of a production geography hold significant promise to incentivize sustainable seafood production, and secure vital ecosystem services from oceans. Practical research that helps refine the model will be key to understanding the transformative potential of these approaches, particularly given the significant impacts that climate change and other stressors continue to put on the marine environment.

ACKNOWLEDGMENTS

We thank members of the panel, "Incentivizing sustainable seafood at the ecosystem scale: Exploring jurisdictional approaches," at the 2019 Seafood Summit for early discussions and key insights on this topic.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

AUTHOR CONTRIBUTIONS

All authors conceptualized the study and contributed equally to the research.

DATA AVAILABILITY STATEMENT

All data are available from the corresponding author via reasonable request.

ETHICS STATEMENT

The study was exempt from Institutional Review Board review and Human Subjects research approval.

ORCID

John N. Kittinger https://orcid.org/0000-0001-8799-7373
Miranda Bernard https://orcid.org/0000-0002-8637-6265
Erin Murphy https://orcid.org/0000-0003-4910-4903
Dane H. Klinger https://orcid.org/0000-0003-4178-8167
Michael L. Schoon https://orcid.org/0000-0003-2477-154X
Kevin J. Dooley https://orcid.org/0000-0001-9993-5161
Leah R. Gerber https://orcid.org/0000-0002-6763-6842

REFERENCES

Aqorau, T. (2009). Recent developments in Pacific tuna fisheries: The Palau arrangement and the vessel day scheme. *International Journal of Marine and Coast Law*, *24*(3), 557–581.

Aqorau, T. (2019). *Fishing for success: Lessons in Pacific regionalism*. Department of Pacific Affairs: The Australian National University.

Aqorau, T., Bell, J., & Kittinger, J. N. (2018). Good governance for migratory species. *Science*, *361*(6408), 1208–1209.

Arton, A., Leiman, A., Petrokofsky, G., Toonen, H., & Longo, C. S. (2020). What do we know about the impacts of the marine stewardship council seafood ecolabelling program? A systematic map. *Environmental Evidence*, *9*, 1–20.

Asche, F., & Bronnmann, J. (2017). Price premiums for ecolabelled seafood: MSC certification in Germany. *Australian Journal of Agricultural and Resource Economics*, *61*, 576–589.

Bellchambers, L. M., Gaughan, D. J., Wise, B. S., Jackson, G., & Fletcher, W. J. (2016). Adopting marine stewardship council certification of Western Australian fisheries at a jurisdictional level: The benefits and challenges. *Fisheries Research*, *183*, 609–616.

Bellmann, C., Tipping, A., & Sumaila, U. R. (2016). Global trade in fish and fishery products: An overview. *Marine Policy*, *69*, 181–188.

Berchicci, L., & King, A. (2007). 11 postcards from the edge. *The Academy of Management Annals*, *1*, 513–547.

Berkes, F., Hughes, T. P., Steneck, R. S., Wilson, J. A., Bellwood, D. R., Crona, B., … Worm, B. (2006). Globalization, roving bandits, and marine resources. *Science*, *311*, 1557–1558.

Birkeland, C. (2017). Working with, not against, coral-reef fisheries. *Coral Reefs*, *36*, 1–11.

Boyd, W., Stickler, C., Duchelle, A., Seymour, F., Nepstad, D., Bahar, N., & Rodriguez-Ward, D.. (2018). Jurisdictional approaches to REDD+ and low emissions development: Progress and prospects. World Resources Institute, Washington, DC, USA. [online]. Retrieved from https://wriorg.s3.amazonaws.com/s3fs-public/ending-tropical-deforestation-jurisdictional-approaches-redd.pdf

Brouwer, S., Pilling, G., Hampton, J., Williams, P., Tremblay-Boyer, L., Vincent, M., Smith, N., & Peatman, T. (2018). The Western and Central Pacific Tuna Fishery: 2017 Overview and Status of Stocks. Tuna Fisheries Assessment Report No. 18. Honolulu, Hawaii.

Brugère, C., Aguilar-Manjarrez, J., Beveridge, M.C. and Soto, D., 2018. The ecosystem approach to aquaculture 10 years on–a critical review and consideration of its future role in blue growth. *Reviews in Aquaculture 11*: 493–514.[online]. Retrieved from https://onlinelibrary.wiley.com/doi/full/10.1111/raq.12242

CEA. (2017). *Progress toward sustainable seafood—By the numbers. California environmental associates*. San Francisco, CA: CEA.

CEA. (2020). Progress toward sustainable seafood—By the numbers. [online]. Retrieved from https://oursharedseas.com/wp-content/uploads/2020/06/2020-Progress-Toward-Sustainable-Seafood-%E2%80%93-By-the-Numbers.pdf

CEA (Editor). (2015). Ocean prosperity roadmap: Fisheries and beyond. California environmental associates (CEA) [online]. Retrieved from http://www.oceanprosperityroadmap.org/wp-content/uploads/2015/05/Synthesis-Report-6.14.15.pdf

CI. (2018). *Exploring the reality of the jurisdictional approach as a tool to achieve sustainability commitments in palm oil and soy supply chains*. Arlington, VA: Conservation International (CI).

Cinner, J. E., Marnane, M. J., McClanahan, T. R., Clark, T. H., & Ben, J. (2005). Trade, tenure, and tradition: Influence of sociocultural factors on resource use in Melanesia. *Conservation Biology*, *19*, 1469–1477.

Cinner, J. E., Sutton, S. G., & Bond, T. G. (2007). Socioeconomic thresholds that affect use of customary fisheries management tools. *Conservation Biology*, *21*, 1603–1611.

Cochrane, K. L. (2018). Eco-labelling and eco-certification of fisheries: Benefits, challenges and the future. In J. C. Seijo & J. G. Sutinen (Eds.), *Advances in fisheries bioeconomics* (pp. 130–152). London: Routledge.

Costanza, R., Andrade, F., Antunes, P., Van Den Belt, M., Boersma, D., Boesch, D., … Young, M. (1998). Principles for sustainable governance of the oceans. *Science*, *281*(5374), 198–199.

Costello, C., Ovando, D., Clavelle, T., Strauss, C. K., Hilborn, R., Melnychuk, M. C., … Leland, A. (2016). Global fishery prospects under contrasting management regimes. *Proceedings of the National Academy of Sciences*, *113*, 5125–5129.

CRC. (2019). Sustainable seafood: A global benchmark. Certification and Ratings Collaboration. [online]. Retrieved from https://certificationandratings.org/sustainable-seafood-a-global-benchmark/

EII. (2017). Jurisdictional sustainability: A primer for practitioners. Earth innovation institute (EII). [online]. Retrieved from https://earthinnovation.org/wp-content/uploads/2017/02/JS-primer_Englishonline.pdf

FAO. (1995). *Code of conduct for responsible fisheries*. Rome: Food and Agriculture Organization of the United Nations.

FAO 2018. The state of world fisheries and aquaculture. Food and agriculture Organization of the United Nations, Rome. [online]: http://www.fao.org/3/I9540EN/i9540en.pdf

Garrett, R. D., Levy, S., Carlson, K. M., Gardner, T. A., Godar, J., Clapp, J., … Ayre, B. (2019). Criteria for effective zero-deforestation commitments. *Global Environmental Change*, *54*, 135–147.

Grafeld, S., Oleson, K. L. L., Teneva, L., & Kittinger, J. N. (2017). Follow that fish: Uncovering the hidden blue economy in coral reef fisheries. *PLoS One*, *12*, e0182104.

Gutierrez, A., & Thornton, T. (2014). Can consumers understand sustainability through seafood eco-labels? A U.S. and UKcase study. *Sustainability*, *6*(11), 8195–8217.

IDH. (2019). Verified sourcing areas. IDH sustainable trade initiative. [online]. Retrieved from https://www.idhsustainabletrade.com/uploaded/2018/08/VSA-Public-Concept-Note_22August2019.pdf

Irawan, S., Widiastomo, T., Tacconi, L., Watts, J. D., & Steni, B. (2019). Exploring the design of jurisdictional REDD+: The case of Central Kalimantan, Indonesia. *Forest Policy and Economics*, *108*, 101853.

ISSF (2019). Status of the world fisheries for tuna. In *ISSF technical report 2019–07*. International Seafood Sustainability Foundation: Washington, D.C..

Jacquet, J., Hocevar, J., Lai, S., Majluf, P., Pelletier, N., Pitcher, T., … Pauly, D. (2009). Conserving wild fish in a sea of market-based efforts. *Oryx*, *44*, 45–56.

Jolly, D. (2013, October 21). Salmon fishermen battle Walmart on certification. *New York Times*.

Kareiva, P., Tallis, H., Ricketts, T. H., Daily, G. C., & Polasky, S. (2011). *Natural capital: Theory and practice of mapping ecosystem services*. London, England: Oxford University Press.

Kittinger, J. N., Teh, L. C. L., Allison, E. H., Bennett, N. J., Crowder, L. B., E. M. Finkbeiner, … T. A. Wilhelm (2017). Committing to Socially Responsible Seafood. *Science*, *356*(6341), 912–913.

Kumar, V., & Christodoulopoulou, A. (2014). Sustainability and branding: An integrated perspective. *Industrial Marketing Management*, *43*(1), 6–15.

Lambin, E. F., & Thorlakson, T. (2018). Sustainability standards: Interactions between private actors, civil society, and governments. *Annual Review of Environment and Resources*, *43*, 369–393.

Lim, K. H., Hu, W., & Nayga, R. M., Jr. (2018). Is marine stewardship Council's ecolabel a rising tide for all? Consumers' willingness to pay for origin-differentiated ecolabeled canned tuna. *Marine Policy*, *96*, 18–26.

Micheli, F., De Leo, G., Shester, G. G., Martone, R. G., Lluch-Cota, S. E., Butner, C., … Jain, M. (2014). A system-wide approach to supporting improvements in seafood production practices and outcomes. *Frontiers in Ecology and the Environment*, *12*, 297–305. https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/110257

NOAA (2019). Hawaii Longline Limited Entry Permit. [online]. Retrieved from https://www.fisheries.noaa.gov/permit/hawaii-longline-limited-entry-permit

Osmundsen, T. C., Amundsen, V. S., Alexander, K. A., Asche, F., Bailey, J., Finstad, B., … Salgado, H. (2020). The operationalisation of sustainability: Sustainable aquaculture production as defined by certification schemes. *Global Environmental Change*, *60*, 102025.

Pacheco, P., O. Hospes, & A. Dermawan. (2017). Zero deforestation and low emissions development: Public and private institutional arrangements under jurisdictional approaches. Center for International Forestry Research, Bogor, Indonesia. [online]. Retrieved from https://www.cifor.org/library/6777/

Pacheco, P., Schoneveld, G., Dermawan, A., Komarudin, H., & Djama, M. (2020). Governing sustainable palm oil supply: Disconnects, complementarities, and antagonisms between state regulations and private standards. *Regulation & Governance*, *14*, 568–598. https://doi.org/10.1111/rego.12220

Pikitch, E. K., Santora, C., Babcock, E. A., Bakun, A., Bonfil, R., Conover, D. O., … Sainsbury, K. J. (2004). Ecosystem-based fishery management. *Science*, *305*, 346–347.

Pollnac, R. B. (1988). Social and cultural characteristics of fishing peoples. *Marine Behaviour and Physiology*, *14*, 23–39.

Porter, M. E., & van der Linde, C. (1995). Toward a new conception of the environment-competitiveness relationship. *Journal of Economic Perspectives*, *9*, 97–118.

Roheim, C. A., Bush, S. R., Asche, F., Sanchirico, J. N., & Uchida, H. (2018). Evolution and future of the sustainable seafood market. *Nature Sustainability*, *1*, 392–398.

Roheim, C. A., & Zhang, D. (2018). Sustainability certification and product substitutability: Evidence from the seafood market. *Food Policy*, *79*, 92–100.

Ross Strategic, Global impact advisors, EON Impact Consulting. (2020). Global seafood markets strategy evaluation final report. Our Shared Seas. [online]. Retrieved from oursharedseas.com/seafoodmarketsevaluation

Saint-Paul, U., & Barletta, M. (2010). Utilization of aquatic resources along the north Brazilian coast with special reference to mangroves as fish nurseries. In C. T. Hoanh, B. W. Szuster, K. Suan-Pheng, A. M. Ismail, & A. D. Noble (Eds.), *Tropical deltas and coastal zones: Food production* (pp. 448–458). London, England: Communities and Environment at the Land–Water Interface. CABI Publishing.

Sala, E., Mayorga, J., Costello, C., Kroodsma, D., Palomares, M. L. D., Pauly, D., … Zeller, D. (2018). The economics of fishing the high seas. *Science Advances*, *4*, eaat2504.

Sampson, G. S., Sanchirico, J. N., Roheim, C. A., Bush, S. R., Taylor, J. E., Allison, E. H., … Wilson, J. R. (2015). Secure sustainable seafood from developing countries. *Science*, *348*, 504–506.

Schlager, E., Blomquist, W., & Tang, S. Y. (1994). Mobile flows, storage, and self-organized institutions for governing common-pool resources. *Land Economics*, *70*, 294–317.

Selden, R. L., Valencia, S. R., Larsen, A. E., Cornejo-Donoso, J., & Wasserman, A. A. (2016). Evaluating seafood eco-labeling as a mechanism to reduce collateral impacts of fisheries in an ecosystem-based fisheries management context. *Marine Policy*, *64*, 102–115.

SFP. (2019). New national-level FIP gets underway in Indonesia, [online]. Retrieved from https://www.sustainablefish.org/News/New-national-level-FIP-gets-underway-in-Indonesia

Soto, D.; Aguilar-Manjarrez, J.; Hishamunda, N. (eds). 2008. Building an ecosystem approach to aquaculture. FAO/Universitat de les Illes Balears Expert Workshop. 7–11 May 2007, Palma de Mallorca, Spain. FAO Fisheries and Aquaculture Proceedings. No. 14. Rome, FAO. 221p.

SPC and FFA. (2010). A regional roadmap for sustainable Pacific fisheries, secretariat of the Pacific community (SPC) & forum Fisheries Agency (FFA). [online]. Retrieved from https://www.ffa.int/system/files/Roadmap_web_0.pdf

Stemle, A., Uchida, H., & Roheim, C. A. (2016). Have dockside prices improved after MSC certification? Analysis of multiple fisheries. *Fisheries Research*, *182*, 116–123.

Stickler, C., Duchelle, A., Ardila, J. P., Nepstad, D., David, O., Chan, C., … Warren, M.. (2018). The state of jurisdictional sustainability: Synthesis for practitioners and policymakers. Earth Innovation Institute (EII), the Center for International Forestry Research (CIFOR) and the Governors' Climate and Forests Task Force (GCF-TF), [online]. Retrieved from https://earthinnovation.org/state-of-jurisdictional-sustainability/

Sumaila, U. R., Khan, A. S., Dyck, A. J., Watson, R., Munro, G., Tydemers, P., & Pauly, D. (2010). A bottom-up re-estimation of global fisheries subsidies. *Journal of Bioeconomics*, *12*, 201–225.

Sutton, M. (1998). Harnessing market forces and consumer power in favour of sustainable fisheries. In T. J. Pitcher, P. J. B. Hart, & D. Pauly (Eds.), *Reinventing fisheries management* (pp. 125–135). Netherlands: Springer.

The FishSite. (2019). Project seeks to improve Indonesian shrimp farming sector. [online]. Retrieved from https://thefishsite.com/articles/project-seeks-to-improve-indonesian-shrimp-farming-sector

Trochta, J. T., Pons, M., Rudd, M. B., Krigbaum, M., Tanz, A., & Hilborn, R. (2018). Ecosystem-based fisheries management: Perception on definitions, implementations, and aspirations. *PLoS One*, *13*(1), e0190467. https://doi.org/10.1371/journal.pone.0190467

Ward, T. (2008). Barriers to biodiversity conservation in marine fishery certification. *Fish and Fisheries*, *9*(2), 169–177.

World Bank Group. (2017). The Sunken Billions Revisited: Progress and Challenges in Global Marine Fisheries, Washington DC [online]. Retrieved from http://documents.worldbank.org/curated/en/347431487184280381/The-sunken-billions-revisited-progress-and-challenges-in-global-marine-fisheries

Worm, B., Hilborn, R., Baum, J. K., Branch, T. A., Collie, J. S., Costello, C., … Zeller, D. (2009). Rebuilding global fisheries. *Science*, *325*, 578–585.

WWF. (2020). World wildlife foundation, Coral Triangle Solutions. [Online]. Retrieved from https://wwf.panda.org/knowledge_hub/where_we_work/coraltriangle/solutions/

Yan, T., Yang, S., & Dooley, K. (2017). A theory of supplier network-based innovation value. *Journal of Purchasing and Supply Management*, *23*, 153–162.

Yeeting, A. D., Weikard, H., Bailey, M., Ram-Bidesi, V., & Bush, S. R. (2018). Stabilising cooperation through pragmatic tolerance: The case of the parties to the Nauru agreement (PNA) tuna fishery. *Regional Environmental Change*, *18*, 885–897. https://doi.org/10.1007/s10113-017-1219-0

Young, O. R. (2002). *The institutional dimensions of environmental change: Fit, interplay, and scale*. Cambridge, MA: MIT Press.

How to cite this article: Kittinger JN, Bernard M, Finkbeiner E, et al. Applying a jurisdictional approach to support sustainable seafood. *Conservation Science and Practice*. 2021;e386. https://doi.org/10.1111/csp2.386