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Duty of stewardship and fisheries governance: a proposed framework

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Abstract

Fisheries often fall prey to overfishing and the exhaustion of stock. Fishing governance is an ongoing attempt to prevent such an outcome. Over time, fisheries regulation has generally moved from controls on inputs to controls on output, such as catch limits and Individual Transferable Quotas. Individual Transferable Quotas have reduced overcapitalization, and have in some cases allowed stocks to rebuild. However, because they enable market trading of catch shares which tends to concentrate fisheries in fewer hands.

This paper proposes applying a duty of stewardship to the existing fisheries governance structure. "Stewardship" is an obligation to be responsible for taking care of another person's property. The concept of stewardship easily applies to fisheries, because fisheries are natural resources which belong to the public. Current regimes, such as Individual Transferable Quotas ("ITQs") do not do enough to prevent the employment of destructive fishing practices and place the burden of natural resource management on the government. Assigning a duty of stewardship upon fishers, whether they own or lease an ITQ, would require fishers to be stewards of common resources and use responsible fishing practices.

Keywords: Individual transferable quotas (ITQs); Duty of stewardship; Fisheries; Management schemes

Introduction

The *tragedy of the commons* is a well-known phenomenon that describes what can happen if there are no controls on the use of a shared resource and too many users willing to deplete that resource (Hardin 1968). Fisheries often fall prey to the tragedy of the commons, and fishing regulation can be regarded as the ongoing attempt to prevent this outcome (Macinko and Schumann 2008). A variety of methods have been employed to manage fisheries, from input controls such as designated season lengths and types of gear that can be used to output controls such as catch limits. (Macinko and Schumann 2008). Many countries have implemented Individual Transferable Quotas, a form of property right that can be transferred. While ITQs have reduced overcapitalization of fish stocks, they have also enabled market trading which concentrates fisheries in fewer hands (Ecotrust Canada 2009; Bromley and Macinko 2007).

This paper proposes applying the duty of stewardship to all fishers. ITQs have reduced overfishing, but have insufficiently protected fisheries from destructive fishing

practices and have resulted in the concentration of fishing into the hands of a few with less reason to think beyond the profits garnered today. As it stands today, the regulator alone is accountable for protecting the resource. Therefore, it has become necessary to legally require that fishers be responsible for protecting the health and productivity of the resource from which they extract. If the immediate benefits of employing certain types of fishing techniques outweigh the negatives of using other practices which are better for the long-term, then fishers have no incentive to be stewards of the fisheries. Consequently, the duty of stewardship must be applied to fishers via individual fishing contracts and/or government regulation that can be applied to any fisher.

Fisheries regulation: concepts and history

The tragedy of the commons theory suggests that multiple individuals, acting independently and rationally on behalf of their own self-interest, will ultimately deplete a shared limited resource if there are no individual property rights. According to the theory, this will happen even though each individual knows that depletion of the resource is not in their own interest, nor in anyone's long-term interest (Hardin 1968).

Private property rights are one way to effectuate sustainable stewardship of shared resources. Farmers are incentivized to conserve land when given permanent and exclusive ownership of that area (Leal 2000). When the owner can reap the benefits as well as suffer the consequences for misuse of property the owner is incentivized to consider the long-term consequences of mis-management land use. As Ziff puts it: "Private property can operate to reduce the ability of an owner to shunt off costs onto others. In the language of economics, private ownership can reduce social costs or 'negative externalities'" (Ziff 1996). While private property incentivizes more sustainable stewardship of common resources, private ownership does not guarantee conservation of resources. If the value of short-term exploitation outweighs the value of long-term conservation, then economic theory suggests that private owners have no incentive to act in such a way to protects the future availability of that resource. In fact, most private owners prefer profits now over profits later (Macinko and Bromley 2004). Bromley, presents several examples of laws that have been promulgated in order to legally require that property owners take care of their property, and argues that these laws would not need to exist if ownership was a sufficient incentive to maintain that property in good order. He concludes: "To be precise about the matter, if the 'time preference' of a private owner is such that income now trumps income in the future, then private owners will be quite intent on liquidating (destroying) a renewable natural resource in order to spend the proceeds—or invest them elsewhere" (Bromley 2009). Consequently, private property rights are not always sufficient to prevent the destruction of a shared resource.

Private ownership is only one solution to natural resource protection. Regulations which focus on the harm can also serve to preserve shared resources. As Ziff points out, "the tragedy of the commons story is not so much an argument in favour of private property as it is a manifestation of the perils of *unregulated* common property" (Ziff 1996). Many researchers do not believe that the solution lies in property laws. Driesen, for example, advocates for a solution that focuses "upon the harms" and not on ownership (Driesen 2002). For example, pastures in the Swiss Alps have successfully been managed as common property for centuries without suffering from overgrazing.

(Ziff 1996; Taylor 1992; Stevenson 1991). Another solution includes a permit system which places limitations specifically on the permit holder. In summary: private property rights are but one one possible way of preventing the tragedy of the commons. Researchers hold widely varying views about the relative effectiveness of the various possible solutions. What is not in doubt is that when there is completely unregulated, open access to a limited shared resource, then that resource is very likely to be depleted and destroyed (de Schutter 2011). Without regulation, natural resources like fisheries are likely to be depleted.

Tragedy of the commons in fisheries

The characteristics of shared fish stocks make them vulnerable to the tragedy of the commons. In the absence of regulation, each fisher owns only the fish he can catch (Churchill and Lowe 1999). Under English common law, this is known as the *rule of capture* (Scott 2000). Given that most fish stocks do not stay in one place, a fish which is not caught today may not be available to fish tomorrow. This promotes the immediate depletion of the fisheries in order to take advantage of their benefits today (Churchill and Lowe 1999). Eggert and Ulmestrand (2007) describe the situation as follows:

> The problems related to open access marine fisheries lead fishermen to lack in responsibilities for future benefit flows. In fact, theoretically, open-access fishery implies that fishermen only care about their own catch today, but completely disregard their potential catch tomorrow and in the more distant future (Clark 1973). It is sometimes held that wealth or the prospect of wealth leads to over exploitation of resources and that myopic behaviour of fishermen is a result of the human nature (Ludwig et al. 1993). However, from an economics perspective, the problem is rather that poorly defined property rights lead to perverse economic incentives, which causes excessive effort and shortsightedness (Björndal and Munro, 1999).

Ownership alone is insufficient to prevent the irresponsible depletion of shared resources. Ostrom finds that the tragedy of the commons applies to fisheries with only one significant difference: the basis for ownership is capture rather than long-term possession. Coastal waters are ripe for overfishing, but regulatory controls and enforcement of such controls can protect fisheries.

Fisheries regulation through input controls

Among the first effort to preserve fisheries was the introduction of licences (Squires 1995). Rather than having open access to fisheries, fishers now had to have licenses which granted them the right to fish. Only a limited number of licenses were available to be given out. As fishing technology has improved, fishers have been able to vastly increase their catch. This meant that the total fishing capacity of the fleet came to easily surpass the sustainable yield. In response to overfishing, governments applied strict conditions on licences, but problems persisted (National Research Council 1999). In some instances, fishing was limited to a certain number of days per year. In other instances, licenses limited the size of the vessels that could be used. Unfortunately these limitations had little effect – fishers quickly developed more efficient ways to fish the

same amount of fish in the reduced timeframe and enhanced their fishing nets to make up for the size of their boat. Without protections, fishers had no incentive to fish sustainably because if they did not catch the fish today, their competitor would catch that fish.

To combat overfishing, governments restricted fishing by setting limits on the quantity of fish stocks that could be fished by license holders (Kerr et al. 2003). Thus, the regulatory approach shifted from a system by which who could fish and what could be used to fish was controlled (i.e. input control) to a system where catch limits were imposed (i.e. output control). Many output control regimes use a type of limited property right called an Individual Transferable Quota ("ITQ"). In an ITQ regime, the government sets a Total Allowable Catch (TAC) for a region and/or a fish species, and grants fishers shares of the TAC, what is known as an ITQ. ITQs are transferable – they can be leased and sold. Transferability is permitted becauseit is expected that this will lead to "efficiency"; the fishermen with the lowest costs will be able to place the highest bids for the ITQs (FAO 2004). Herein lies the problem – the license holders no longer have any more than a financial stake in the health and viability of the fishery.

ITQs have reduced overfishing and helped to preserve fish stocks. The most important impact of ITQs has been to put a stop to the "race to fish." Some fisheries utilize the TACs, but do not assign individual quotas. This means that each season a TAC is set and once that TAC has been met in the aggregate the fishing season is closed. This system incentivizes individual fisheries to use whatever techniques to capture as many fish as quickly as possible. There are no consequences for using techniques that are harmful to the health of the fishery (such as techniques that capture significant amounts of bycatch in addition to the desired catch). Thus, behaviors dedicated to simply maximizing profits do not guarantee the most rational behavior nor the most productive, sustainable approach. Market based principles such as profit maximization do not actually guarantee that industries will act in their best interests.

While ITQ regulations have succeeded in conserving the particular fish stock managed by the ITQ regime, there is no certainty that ITQs alone can protect the future viability of the fishery (Chu 2008). If the TAC for a fishery is set too high, ITQs may succeed in limiting the catch to that amount, but too many fish will be caught and the resource will eventually be exhausted. Therefore, ITQs make little difference unless the TAC is set at the appropriate level. But even if the TAC has been properly set, exhaustion can be economically rational under a property rights regime if the benefits of fishing today outweigh the benefits of leaving fish for tomorrow (i.e. the discount rate). Sumaila modeled Canada's Atlantic cod fishery off Newfoundland, and found that a discount rate of 20% resulted in a predicted collapse that closely paralleled the actual collapse that occurred after ITQs were introduced to that fishery (Sumaila 2010).

ITQs have been criticized for a number of reasons. First, ITQ regimes have enabled fishers with licenses to reap significant profits, but have not set aside any money for the public or for the protection of the natural resource (Bromley 2009). As a public resource, it seems reasonable that the public should be compensated for the yearly depletion of the fish, even if it is sustainably depleted. Also, it would seem that licenseholders should be responsible for contributing to efforts to maintain the health and viability of fish and their habitat. Second, ITQregimes typically concentrate ownership

and profits into a few parties, usually large fishing companies and processors (Copes and Charles 2004). This often results in job losses and can be associated with the disappearance of small fishers who cannot compete with the larger companies. The hardest hit by the concentration of licenses in large fishing operations are the coastal communities and small-scale fisheries who depend on the fish for a livelihood and food (Davis 1996). As a result, ITQs have often faced intense opposition from small-scale and traditional fishers (Macinko 2007). Researchers are concerned about the consequences of utilizing ITQs in Third World nations, where traditional fisheries are seen as necessary for the survival of millions of low-income people (Kurien 2004). Even in wealthier nations, there are fears about the long-term impacts on ecosystems and communities that may result if economic efficiency is allowed to be the sole determinant of fisheries policy. Consequently, many are seeking alternative policy strategies that could achieve some of the benefits of ITQs while avoiding their worst negative impacts.

An alternative: the duty of stewardship in fisheries

This paper proposes defining the legal duty of stewardship to fisheries and marine ecosystems and applying this duty of stewardship to the existing fisheries governance structure.

What is a *duty of stewardship*? Black's Law Dictionary defines a steward as "a person appointed to manage the affairs of another" (Garner 2009). Thus, the person who owns a valuable item outright generally has no duty of stewardship with respect to that item. There is nolegal obligation to take care of the item owned, though there may be obligations to take care that your ownership does not affect other privately owned items. Duties of stewardship, either implicit or explicit, abound in our everyday lives.

Land is one privately owned "item" where many researchers have discussed the application of the duty of stewardship. Legal experts, such as Hamilton (1998) and Karp (1993), have argued that landowners should be subject to a duty of stewardship with respect to their land, even if they own it in *fee simple*. Under traditional concepts of land ownership, a landowner has complete freedom to use their land as they wish. This view is contrary to traditional concepts of ownership, which are founded on the idea that a landowner has nearly complete freedom to do as he likes with his land. This traditional view, however, is severely weakened by the fact that what an owner does with his land can have significant impacts on other people, across space and time. According to Karp (1993), "[l]and is fundamentally different from other forms of property. Because any parcel of land is part of a network of natural systems extending beyond the boundaries described in the deed, it attains an importance superior to any individual landowner or to any period in time. Land is essential to our right of survival". In a few jurisdictions, notably Iowa, this concept has been recognized and validated in common law, thus restricting the freedom of landowners to some degree (Hamilton 2011).

The concepts of stewardship and "land ethic" are highly controversial in the agricultural realm because these concepts appear to infringe on the presumption that the owner of real property should be free to do with their property as they wish. Legally speaking, fisheries are different from farms. While land owners own the land, fishers own neither the uncaught fish, nor the water in which the fish swim. Uncaught fish

and marine resources, generally, are considered the property of the public. Therefore, the concept of a duty of stewardship – a responsibility to take care of the property of others – is compatible with the legal nature of a fishery. Because fishers are not owners, fishers must be explicitly subject to a duty of stewardship in order to be held legally accountable for fishing responsible.

Most proponents of ownership-based schemes such as ITQs argue that ownership itself promotes the conservation and protection of marine resources similarly to someone subject to a duty of stewardship. ITQ supporters believe that proper stewardship behavior results from a properly designed and implemented ITQ regime (Bromley 2009). Macinko and Whitmore dismiss this claim, and state: "The simple truth is that ownership does not ensure stewardship or conservation. We know … that both private and public owners may either care for natural resources or abuse them" (Macinko and Whitmore 2009).

While ownership may or may not improve the odds that an individual will be a good steward of natural resources, another important question remains. Will the future stream of benefits derived from being a good steward exceed the current benefits of natural resource overexploitation? Or in other words, what is a fisher's incentive to be a steward? It is rational to expect an owner to exploit natural resources if the benefits of taking natural resources today is greater than the benefits of ensuring their future existence. Much of this depends on the actions of other fishers who are at the same time weighing the same concerns. The fear is that another fisher will get what you did not catch, but have the capacity to catch. Therefore, without legislated or contractually set limitations on how and what a fisher can catch, the tragedy of the commons persists.

Poaching and illegal, unreported, unregulated fishing (IUU) alters the benefits that fishers can expect in the future. If fishers believe that other fishers can cheat and increase their returns, the future benefit stream will be seen as risky. Effective and credible enforcement will reduce the risk of being a good steward and balance current and future benefits. Therefore, proper enforcement is an integral part to the solution. Inherently this means that the management scheme would not in fact be voluntary. For fisheries, stewardship does not automatically flow from ownership. Consequently a duty of stewardship needs to be explicitly created and imposed (Macinko 2007). It is dangerous to assume that adequate stewardship will result simply from assigning ownership rights.

According to Macinko stewardship should be the goal itself, a mechanism for achieving conservation. He describes stewardship as "an ethic, an attitude, a responsibility" (Macinko 2007). For Macinko, the term "stewardship" represents the legal and operational mechanism that this paper calls a "duty of stewardship", and the underlying meta-governance principles and ethics that justify creating this mechanism.

Ownership of property is tied to certain property laws, depending on the type of ownership. Without a legislated or contractual duty, the duty of stewardship is to be understood as a duty under tort law. The idea is that the duty of stewardship is applicable regardless of the category of property rights at play or it can be utilized in association with management measures that do not involve property rights. The duty of stewardship is intended to supplemental existing fisheries management methods because the current schemes are incomplete. It is not a standalone duty.

The underlying meta-principles

The application of a duty of stewardship is further justified by meta-principles or the underlying principles and assumptions of fisheries governance (Kooiman et al. 2008). As Kooiman et al. (2005) says, "[w]hen governors define the problems they think should be addressed and the solutions to these problems, they inevitably draw on fundamental assumptions and worldviews that should be brought to the surface so they can be explained, defended and examined". Kooiman proposed a list of twelve ethics and principles for the meta-governance of fisheries (Kooiman et al. 2005). These principles justify the application of a duty of stewardship to fisheries governance. According to the meta-principles, the preservation of species and ecosystems is morally good. A duty of stewardship promotes environmental ethics by requiring fishers to preserve the marine environment on which they depend.

The duty of stewardship has been linked to the "land ethic" and sheds light on the application of the duty upon actors within fisheries. Hamilton (2010) wrote:

> [I]n many ways Leopold's views provided a theoretical underpinning for the modern ecology movement, which attempts to alter how man relates to the environment and to assign the costs of environmental degradation to those responsible… Even if the United States experiences difficulty developing a true Leopoldian land ethic, it does not mean society is without methods to address agriculture's impact on the environment. In an increasingly legalized society we have come to rely on laws and legal duties as a substitute for a land ethic. Laws which impose a duty on landowners to protect their soil from erosion, such as one enacted in Iowa in 1971, and new laws requiring farmers to account for their impact on the environment have the effect of changing the man-land relation. It is true, by regulating the relation of individuals to society rather than the individual to the land, these laws function in a different ethical dimension than would a true "land ethic." But as society comes to view protecting the environment as a significant societal goal, the substitution of legal duties, although not a perfect proxy for a "land ethic," may be the legacy of the second stage of environmental policy toward agriculture.

The purpose of the "land ethic" is to obligate individuals to be responsible stewards of the land and prevent land degradation. Hamilton does not analyze the success of Iowa's laws in preventing land degradation. However, Eswaran argues that few jurisdictions in the world are successful in preventing land degradation. In addition, there is considerable disagreement about definition of land degradation, and about how it should be assessed and measured (Eswaran et al. 2001).

The scope of a duty of stewardship driven by the considerations of environmental ethics will vary depending on the focus of the ethic. Under a human-centred environmental ethic, organisms other than humans are valued only according to their effect on humans. A humancentric focus in turn narrows the scope of the duty of stewardship wherein the obligation to prevent environmental degradation extends as far as harms that negatively impact humans. Under a nature-centered environmental ethic, all organisms are morally relevant. Consequentially, the scope of the stewardship duty would be broader because actors would be obligated to avoid negatively impacting any nature.

Meta-principle: sustainability

Examining the application of the meta-principle of sustainability to agricultural practices also helps to shed light on the relevance of applying the duty of stewardship to fisheries. Practitioners debate the definition of "sustainability," but at its simplest it can be described as meeting the needs of the present without compromising the ability of future generations to meet their own needs (National Academy of Sciences 2010). In the context of agriculture, Hamilton (1998) provides the following highly informative definition:

> Sustainable agriculture is defined in various ways, but in its simplest form, it means developing agricultural practices which protect the environment while preserving the economic profitability of farmers. The basis of the concept is that no agricultural system can be successful in either the short or long term unless it is designed to sustain the resources necessary for its operation. These resources include both physical resources of soil, air, and water, and also human and social resources of farm families, rural communities, and the economic structurenecessary for an agrarian system to function.

In other words, sustainable practices provide for current use of natural resources which is not at odds with the future health and viability of those natural resources. Iowa law defines "sustainable agriculture" as actions "preserving the high productivity and quality of Iowa's land" (Iowa Code 1997). Under Iowa law, agriculturists are required to care for the land so that it remains productive for someone else's use in the future (Iowa Code 1997). This legal requirement can be equated to the type of duty of stewardship advocated to be applied to fisheries – it is an obligation to preserve a natural resource, may it be land or a fishery, in good enough condition that a future user can enjoy the same quality of resource.

Fisheries are similar to, but not the same as land and agriculture. In the case of fisheries, the general public owns the resource, not the fishers. Even when fishers own quotas, that quota represents a beneficial right to catch a certain quantity of fish not a specific quantity of uncaught fish in the ocean that they own. Sustainable fishing is fishing in a manner that maintains and protects the ecosystems and populations needed to sustain the fishery. Because fishers do not own the fish or the ecosystem in which the fish live, the obligation to be stewards and the benefits derived from being good stewards are not necessarily self-apparent. However, in order to maintain livelihoods and food sources that have been depended on for decades, perhaps even centuries, the responsibility to preserve the fisheries becomes more obvious.

Meta-principle: food security

Another important meta-principle and justification for expecting/requiring fishers to be stewards is food security (Bavinck and Chuenpagdee 2005). Food security is sometimes regarded simply as a matter of quantity, but this is insufficient. The World Bank defines food security as "access by all people at all times to enough food for an active healthy life" World Bank (1996). Thus, achieving food security requires ensuring that an adequate food supply is physically and economically available to everyone, especially in regions that cannot produce enough food because of

climate or geographic constraints, and especially for people with low incomes (Chuenpagdee et al. 2005). Not surprisingly, small-scale fisheries have been recognized as playing a vital role in improving food security in many countries (Kooiman and Jentoft 2005).

A duty of stewardship will protect small-scale fisheries and their ability to serve as a livelihood for many and food for others. Small-scale fisheries are the fishers most at risk of unsustainable fishing and illegal fishing. Obligating all fishers to be stewards of the fishery and surrounding ecosystem will benefit everyone, the fisheries and the communities who depend on fishing for a livelihood and source of food.

The precautionary principle

The duty of stewardship is essentially a call to not act without knowing the consequences. The precautionary principle states that one should not undertake an activity for which there is no evidence of its safety. Specifically, within the environmental context, the principle states that when ecological or health risks are suspects, those risks should be reduced and less-risky alternatives should be pursued where possible (Myers and Raffensperger 2006). Even in the face of inconclusive science, precautions should be taken. Furthermore, before engaging in activities that could potentially harm the environment, the risks should be researched. As good stewards, the mere possibility that an activity could cause irreparable harm would be sufficient to prevent further actions.

Kooiman recommended that the precautionary principle be applied to fisheries governance in the Code of Conduct for Responsible Fisheries (FAO 1995). According to the FAO: "[m]anagement according to the precautionary approach exercises prudent foresight to avoid unacceptable or undesirable situations, taking into account that changes in fisheries systems are only slowly reversible, difficult to control, not well understood, and subject to change in the environment and human values" (Kooiman et al. 2005). It is hard to say how the actions of today will affect the viability of the fisheries in the future. Consequently, it is in the best interests of fishers to investigate any potential risks from activities before engaging in them. The benefit of requiring the application of the duty of stewardship via legislation or individual fishing contracts is that if a steward has any question about the safety of his/her fishing practices and harms result as a result of his/her fishing, he/she would be responsible.

Meta-principles: responsiveness, respect and inclusiveness

Kooiman also proposes applying the principles of responsiveness, respect and inclusiveness to fisheries governance (Kooiman et al. 2005; Kooiman and Jentoft 2009). All fishery stakeholders should be provided the opportunity to be heard and have their interests protected. They should be actively engaged in the creation and implementation of a fisheries governance structure, which should be structured in such a way to respond to concerns. By including all the stakeholders in the governance structure, you are more likely to get engaged stakeholders who understand and comply with the rules. Furthermore, the group can take advantage of the myriad of expertise available to them via the participation of such a wide group of stakeholders. Many stakeholders already regard themselves as stewards and their leadership within these governance structures can help to educate others.

The public trust doctrine

The Public Trust Doctrine states that the government holds certain natural resources, such as navigable waters, in trust for use by the public. Brewer and Libecap (2007) explain the public trust doctrine in greater detail:

> To insure group values are respected, the rights of the public are vested in the state as trustee of the resource. As such, the state through its administrative agencies has a duty to administer, protect, manage and conserve the resource. Any existing private users have only usufruct rights that can be withdrawn whenever the state deems that they are inconsistent with the public trust. Because there are no private property rights, there is no basis for takings challenges in such reallocations. Furthermore, the legislature cannot alienate trust resources, which must remain with the state.

Under this doctrine, the State is the steward for resources on behalf of the public. In addition, the doctrine holds that the public's ownership of the resource cannot be alienated, and so the resource cannot become private property. If the government were to deny access by the public to these resources held in trust, a "takings challenge" could be initiated against the government (Hamilton 2010).

A large shortcoming of this doctrine is that while the government has self-designated as the "steward" of such resources, the only actions they are required to take are those that are explicitly prescribed by law. Otherwise, the government is not obligated to act to steward the resources. Therefore, a government cannot be sued unless a statute requires the government to do something, and the government fails to do it. In short, even though the doctrine places the state in a stewardship role, it does *not* impose a general requirement that the government behave responsibly.

Usufructuary obligations

Usufructuary obligations are similar to that of a steward's as described here. A usufruct has the right to enjoy the property and the fruit of that property (i.e. the profits that can be derived from the property such as crops), but does not own full rights to the property. However, the usufruct can lose their right to the property if their actions destroy the property. According to LeVan (1962), under Anglo-American common law, a legal life tenant "may not change the premises in such a way that remaindermen or reversioners would have "reasonable ground for objection thereto". In Japan, fisheries are managed by Fishery Cooperative Associations ("FCAs"), organizations made up of local fishers (Lim 199–200). The FCAs are responsible for designing the rules their members follow and coordinating with the government which sets allocation limits (McIlwain 2013). A usufruct prescribes essentially the same obligations as the duty of stewardship. A usufruct is allowed to utilize the resources available to them on the property; however, they cannot reduce the value or quality of the property or natural resources on the property.

Introducing stewardship in fisheries

Assigning ITQs is just part of properly managing fisheries. ITQs must be supplemented with the application of a duty of stewardship in order to ensure that fishers are required

to sustainably fish. Fishers can be motivated to become stewards through legal requirements, contractual requirements or consumer expectations. And for any of these structures to work it is imperative those being managed, the regulators as well as the consumers must understand what is required to be a "steward."

Small-scale fisheries in developed countries are recognizing the importance of differentiating their products through sustainability. But to achieve this distinction requires an underlying and fundamental attitude change: these fishers must be able to present themselves as stewards of the sea. In order to benefit from this distinction fishers have developed various marketing schemes such as Consumer Supported Fisheries (CSFs) and Sustainability Labeling Schemes that highlight the use of sustainable fishing methods and the compliance with any fishing regulations in place. These schemes use tools such as eco, sustainable, and wild labeling, and traceability techniques to connect consumers with fishers (Kooiman and Jentoft 2005). Such marketing will entice consumers to buy only sustainably caught fish and fish-products, thereby pressuring other fishers to become stewards.

The effective use of market-based incentives such as special labels or preferred purchasing agreements requires both a voluntary adoption of the duty of stewardship and an educated consumer. First, consumers must understand how important it is that fishers are stewards. They must be educated as to the import of fishing sustainably and complying withlimits on the stocks and areas in which they can fish. If consumers understand this, they will be more inclined to purchase products to be fished sustainably. Second, fishers must benefit from the voluntary adoption of stewardship practices. In other words, fishers must reap benefits from being distinguished from fishers who do not fish sustainably or act as stewards. While market-based incentives may be effective, the circumstances call for a more immediate shift in practices. Legislation must be promulgated that requires fishers to be stewards, or contracts must be revised/written anew to include provisions requiring stewardship by license holders. There are many fishers who currently, without regulation, act as stewards.

Unfortunately the vast majority of fishers may fish within the limits of their ITQs, but not act as stewards. Being subject to a duty of stewardship would mean that a fisher who uses or consumes a fish stock in a way that destroys that stock or its habitat could be held liable for the damage he/she caused. Explicitly associating a duty to conserve the stock with holding a quota or licence would allow the possibility of legal action by a third party against a resource user who neglects this duty – not only against the regulator, as in the example in the preceding section. If enforced, fishers would be motivated to act as responsible resources managers.

ITQs have presented one of the largest challenges to promoting stewardship because ITQs can be leased, which has been show to weaken the incentives:

> According to some fishery managers and experts, leasing reduces stewardship incentives, which may impact the community's long-term economic viability. Quota leasing separates the person holding the quota from the person fishing the quota. In some cases, quota leasing may diminish stewardship incentives by creating a class of absentee quota holders who rely on independent fishermen. While owner-on-board rules, such as those in Alaska, may minimize the risk of creating this class of absentee quota holders, fishermen who lease quota have only a

> temporary privilege to catch fish. Thus, they have less interest in the long-term health of the fishery, especially as the end of their lease term approaches. Consequently, incentives may exist to catch more fish than their quota allows and sell this over-quota fish on the black market or to fish using nonsustainable methods. For example, according to New Zealand fishery experts, quota holders in the high-value abalone fishery found that unskilled fishermen who leased quota were jeopardizing the fish by extracting them in ways that harmed the abalone beds. (Government Accountability Office 2004)

When ITQs are leased, the lessee is less likely to have any feeling of obligation to do more than take advantage of their current license to fish. But the lessor has an incentive to ensure that the lessee does in fact act as a good steward. Similar concerns about the lack of an incentive for leaseholders to conserve a resource arise in agriculture. To combat that, many farm lease agreements include a "good husbandry provision", which act to impose a stewardship obligation upon the leaseholder. Retired landowners in Iowa are increasingly choosing to impose such a duty in farmland leases (Cox 2011a). The Iowa Supreme Court has held that "the purpose of a good husbandry provision is mandating the proper use of land rather than requiring high yields", a finding that clearly creates an obligation to act as a good steward of the owner's land (Cox 2011b).

If the duty of stewardship was acknowledged as an obligation on all fishers, including the lessees of ITQs, the lessor would be abled to hold the lessee accountable for any damages caused (Hamilton 2010). Where fishers use destructive practices in instances where they could use lessdestructive fishing gear or methods, lessor could get damages. It is in the lessor's interest to safeguard the future stream of benefits, while the lessee is exposed to strong incentives to maximize his current benefits (Munro et al. 2009). The duty of stewardship allows the lessor to do so even in the absence of strong enforcement. It might be necessary to state some of the practices that are unacceptable to the lessor, but it would be impossible to include an exhaustive list of everything that is and is not acceptable. Therefore, it will probably be necessary to definethe duty of stewardship in such a way that allows for unforeseen situations in addition to examples of known unacceptable practices. The benefit is that although the duty would cover a wide range of situations, the inclusion of examples would guide the courts and reduce the risk that a court might find the clause to be too vague to be enforced.

A stewardship clause in a quota lease agreement could resemble the following: "It is the duty of the lessee to exercise good stewardship with respect to the fish stock and the environment in which the fish stock lives. Good stewardship is defined as neither fishing, nor conducting other activities in the marine environment, in a manner which will or is likely to significantly degrade the fish stock or its environment, according to experience and/or scientific knowledge that is reasonably available to fishermen, UNLESS no reasonably feasible alternative manner of operation exists." There has been significant research on the proper methods of fishing.

Therefore, this research would serve as the basis for determining what practices and actions do and do not qualify as good proper stewardship. For example, if a lessee was found to utilize bottom trawling which has been found to destroy coral reefs and take in bycatch, the lessee would be found liable for failing to fulfill his duty of stewardship.

At the same time that regulations are put in place, economic incentives can also be used. For example, in order to be able to renew a fishing license the license holder would have to demonstrate adequate stewardship. If a fisher has *not* been found in breach of this duty, his/her license or quota could be renewed; otherwise it could be revoked. This would also mean that if the ITQ holder leases the quota to another fisher and that fisher fails to comply, the license holder could lose the license. This in essence disincentivizes the licensing of ITQs (which has other negative impacts on fishing, including pushing out small-scale fisheries) and makes the licensor accountable for properly vetting and monitoring the actions of the licensee. One of the benefits is that regulators would not have to dismantle the entire scheme to punish one person. Instead, the regulator would have the authority to cancel a specific fisher's quotas without affecting the system as a whole.

Ideally countries will implement a legislative duty of stewardship. However, if neither statutory law or a contract explicitly defines a duty of stewardship, the courts may be asked to find whether an implied duty of stewardship exists under common law. Different jurisdictions may answer this question differently, unless a higher court with a broader jurisdiction has made a decision. It is then up to practitioners to ask a court whether a duty exists, and whether a party has breached their duty. This is what happened in *Heiderscheit*, where Iowa's appeal court found an implied covenant of good husbandry (Heiderscheit 1986).

The legislature should impose a statutory duty of stewardship by codifying the duty into fisheries acts, using wording resembling that proposed above for a lease agreement.

What outcomes could Be expected?

One of the limitations of systems such as ITQs is that if one or a few fishers damage the resource, the impact is nevertheless absorbed by all quota holders. This may happen, for example, when a TAC must be lowered because of significant overfishing. In short, the "stick" is used against all. In principle, the recognition of a duty of stewardship would make it possible to penalize the specific culprit. This would encourage mutual self-monitoring among the users.

In jurisdictions such as the United States, a duty of stewardship may also have the benefit of replacing the unpredictability and theoretically unlimited scope of tort lawsuits with litigation based on the more specific and limited grounds that are specified by the legislation or precedents defining the fishers' duty of stewardship. A recent lawsuit against the US government for its alleged failure to control bycatch illustrates the problem; it is highly unlikely that the tour boat operator who launched the lawsuit is suffering more than a small fraction of whatever ecological harm has occurred, and it is certainly true that those whose actions could directly cause the problem would not be sued at all (The Boat Company 2012). A properly defined duty of stewardship would enable actions to be brought on the more relevant grounds of ecosystem and fishery damage, and would enable them to be brought against those who actually caused the damage.

A duty of stewardship will increase inclusiveness in fisheries governance. In catch share schemes, the government authorizes users (quota holders) to use the resource.

Other stakeholders are not included in the management framework. For example, conservation groups and environmental non-governmental organizations (NGOs) are often excluded, and can only affect the current system by way of public awareness and other activities outside the management scheme. The public is excluded as well; the government as trustee acts on behalf of the public. Acknowledging the public as a stakeholder will increase accountability by acknowledging thatmore people than just the license holders are affected by the use of unsustainable fishing practices and empowers them to take action.

A duty of stewardship changes the relationship between quota holders and other stakeholders. For example, conservationists, small-scale fishers or NGOs could hold large-scale operators using destructive practices, such as trawlers, accountable. They could sue them for breaching their duty to use least destructive fishing practices. This in turn would allow stakeholders to take an active role in a framework that includes those who were previously unable to participate directly.

In this way, using a duty of stewardship appropriately could change the relationship between government and other stakeholders towards a more inclusive and balanced model. In contemporary fishery management, there is a strong call for self-governance and co-governance, as well as for community-based approaches. The duty of stewardship has the potential to bring the stakeholders into a new form of relationship where the government could itself be held accountable. In other words, the duty of stewardship may level the playing field. Furthermore, to the extent that the duty is shared, it could align the resource users and managers, including the government, so that they are more likely to cooperate in order to act in an ecologically sound manner.

Conclusion

As the world's human population grows, traditional "open access" capture fisheries have increasingly often collapsed. The "tragedy of the commons" scenario appears to model these fisheries quite well. Governments and regulators have implemented many types of controls in an effort to preserve fisheries. In recent years, ITQs have become a popular solution, partly because it is believed that they provide an incentive to conserve. However, ITQs have been found to concentrate ownership of ITQs in the hands of large-scale fishers and to do little to incentivize conservation.

This paper proposes that supplementing the ITQ regime with a duty of stewardship would require the necessary conservation and preservation needed in order to adequately protect fisheries for current and future use. The duty of stewardship concept originated in the agricultural context, and is well-suited to resolve unsustainable fishing practices. The duty of stewardship could be applied to fishers and regulators through legislation or contractual provisions. The duty of stewardship is also compatible with many important meta-governance principles proposed to be applied to fisheries. Apply an explicit duty of stewardship to fisheries will result in accountable regulators and fishers, will include all the affected stakeholders in the development and implementation the duty as well as the management of the fishery, and result in better fish and ecosystem conservation.

Competing interests
The authors declare that they have no competing interests.

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