

5-31-2014

## Do Private Property Rights Promote Sustainability? Examining Individual Transferable Quotas in Fisheries

Adam Soliman

Follow this and additional works at: <https://digitalcommons.law.seattleu.edu/sjel>

---

### Recommended Citation

Soliman, Adam (2014) "Do Private Property Rights Promote Sustainability? Examining Individual Transferable Quotas in Fisheries," *Seattle Journal of Environmental Law*. Vol. 4: Iss. 1, Article 9. Available at: <https://digitalcommons.law.seattleu.edu/sjel/vol4/iss1/9>

This Article is brought to you for free and open access by the Student Publications and Programs at Seattle University School of Law Digital Commons. It has been accepted for inclusion in Seattle Journal of Environmental Law by an authorized editor of Seattle University School of Law Digital Commons.

# Do Private Property Rights Promote Sustainability? Examining Individual Transferable Quotas in Fisheries

*Adam Soliman*<sup>†</sup>

*Global marine fish resources have suffered from serious overfishing since 1950, and many marine resources are highly threatened. Various management regimes, including, but not limited to individual transferable quotas (ITQs), have been implemented worldwide to regulate fisheries. It is believed that ITQs have improved fishery management and restored declining fisheries to be sustainable. ITQs are designed both to: (1) provide an incentive to the individual fishers to protect the fishery by creating a financial interest in the fishery's ongoing productivity, and (2) enable the government to manage the fishery effectively. Using this system, governments are able to limit the extraction of fish from the ocean. ITQs incentivize Fishers to limit their consumption in order to keep their ITQ and ensure there is future value in their ITQ. This study focuses on whether property rights, as implemented in the form of ITQs, effectively increase the sustainability of a fishery. While ITQs do confer proprietary interests upon the quota holders, these interests fall short of full private ownership in a legal sense. Contrary to some claims, the property rights provided by ITQs are neither necessary nor sufficient to guarantee good stewardship of a fishery. However, this study argues these rights do create strong incentives for stewardship, and have improved sustainability in many fisheries around the world.*

## TABLE OF CONTENTS

I. Introduction .....	246
-----------------------	-----

---

<sup>†</sup> Adam Soliman is the director of The Fisheries Law Centre. He is a researcher focused on legal and economic issues in Fisheries & Seafood sectors. He started his career in the agribusiness sector and holds graduate degrees in Agricultural Economics (BSc & MSc), Law (JD), and Agriculture and Food Law (LLM). Adam's research interest is in fisheries laws and regulations as well as fisheries economics. In particular, he is interested in conducting analysis to issues in fisheries management with special focus on small-scale fisheries. Adam strongly believes that such interdisciplinary research is much needed especially in this area where research is scarce. Adam can be reached at [adam@fishlaw.org](mailto:adam@fishlaw.org)

II. The Nature of ITQs.....	249
A. Fisheries and “The Tragedy of the Commons” .....	249
B. The Transition to Output Control and Individual Quotas .....	251
III. Property Rights and ITQs.....	252
A. The Nature of Property Rights.....	252
B. Community Property Rights.....	255
C. ITQs as Property Rights.....	256
D. Driesen’s Criticism of Property Rights .....	264
IV. Evaluating ITQs.....	265
A. Introduction .....	265
B. Bromley’s Criticisms of ITQs for Sustainability .....	265
C. Arguments Supporting ITQs as an Approach to Sustainability ....	273
1. Leal and Arnason .....	273
2. The Principal-Agent Model .....	274
3. Leader-Follower Model .....	276
4. Further Empirical Evidence .....	278
D. Other Criticisms of ITQs .....	279
V. Conclusions and Recommendations .....	280

## I. INTRODUCTION

Since the 1950s the world’s marine fish resources have suffered from serious overfishing,<sup>1</sup> and many fisheries are in great danger. Various management regimes have been implemented around the world in an effort to overcome this problem. One prominent management regime is the Individual Transferable Quota (ITQ) system. While ITQs exist in many jurisdictions, the schemes in New Zealand, Australia, Iceland, Canada and the United States are best known and most discussed. This study will use these schemes to understand the benefits of ITQs. An ITQ is, essentially, a license held by an individual or an organization, which provides them with a share of the total allowable catch (TAC) of fish.<sup>2</sup> Like all licenses, it is a privilege allowed by the government of that nation. The specifics of each ITQ system may differ, but they all assign to individual fishers or companies a specific

---

1. Boris Worm et al., *Impacts of Biodiversity Loss on Ocean Ecosystem Services*, 314 SCI. MAG. 788 (2006).

2. Cindy Chu, *Thirty Years Later: The Global Growth of ITQs and Their Influence on Stock Status in Marine Fisheries*, 10 FISH & FISHERIES 217 (2008).

proportion of the amount that the government determines it can safely be fished. The TAC is generally based upon scientific data.<sup>3</sup> ITQs are called transferable quotas because they can be bought and sold by any legally defined “person”<sup>4</sup> and they can be worth a significant amount of money. ITQs are a privilege and not property because they exist solely at the discretion of the government. Many analysts believe that the ITQ system has preserved sustainability in fisheries more effectively than the alternatives.<sup>5</sup> Other researchers, however, do not believe that ITQs contribute significantly to sustainability,<sup>6</sup> and heated arguments sometimes result. Reviewing and assessing these arguments is one of the main purposes of this paper.

Although it may not be immediately obvious, arguments about the effectiveness of ITQs, as a means of ensuring sustainable fisheries, are closely linked to a more legalistic and theoretical question: Can ITQs be properly classified as “property rights” or “ownership” in legal terms? Some theorists consider “Property” a bundle of rights<sup>7</sup>; these rights may include the ability to exclude others from the use of the property, the existence of a judicial relationship between the person and the property, and the entitlement to derive profit from the property.<sup>8</sup> These rights appear to apply to the “owner” of an ITQ. But can the ITQ truly be considered “property” if the owner is still subject to government intervention, up to and including revocation of the ITQ without compensation? Does this mean that the quota is a mere “interest”, rather than a right, or that it is only a license or privilege rather than a form of property?

This paper begins by explaining the nature of ITQs in the context of historical trends in fisheries regulation. Next, the paper addresses whether and to what extent ITQs confer property rights. The next section reviews the important controversy about whether or not property rights in general and ITQs in particular encourage socially beneficial stewardship, i.e., the avoidance of overfishing. Then, the author sets out the criticisms

---

3. Timothy Essington et al., *Catch Shares, Fisheries, and Ecological Stewardship: A Comparative Analysis of Resource Responses to a Rights-Based Policy Instrument*, 5 CONSERVATION LETTERS 186, 188 (2012).

4. “Persons” also includes corporations.

5. See, e.g., Gordon R. Munro et al., *Impacts of Harvesting Rights in Canadian Pacific Fisheries*, STAT. AND ECON. ANALYSIS SERIES NO. 1-3, 2009, at 6-13; Dietmar Grimm et al., *Assessing Catch Shares’ Effects: Evidence from Federal United States and Associated British Columbian Fisheries*, 36 MARINE POL’Y 654, 657 (2012).

6. See, e.g., Daniel Bromley, *Abdicating Responsibility: The Receipts of Fisheries Policy*, 34 FISHERIES 280, 290 (2009).

7. BRUCE ZIFF, PRINCIPLES OF PROPERTY LAW 2-5 (1996).

8. *Id.*

of ITQs as related to property rights as well as responses to those criticisms. Finally, the paper will assess the overall value of ITQs as a fisheries management tool.

This paper will argue that ITQs do confer a form of property right upon the quota holders.<sup>9</sup> The nature of these rights differs significantly across jurisdictions because of differences in legislation and case law.<sup>10</sup> If ITQs were truly property rights, as opposed to privileges, then governments could not take them without some form of compensation. If ITQs were truly property rights rather than privileges, then they would include the bundle of property rights associated with property law in that jurisdiction. In some jurisdictions, ITQs have been recognized as property<sup>11</sup> for certain specific purposes, while in others they are mere privileges.<sup>12</sup> In all jurisdictions, however, ITQs do not provide their holders with all the characteristics of legal “ownership.” This is because ownership entails a specific set of rights including the right to be compensated if the property is taken, while ITQ licenses do not grant the right to compensation. It is possible that the TAC for a particular year, and therefore the proportion that an ITQ holder may catch, can be zero.

With respect to stewardship, proponents of ITQs generally argue that the absence of property rights is the source of the economic and sustainability problems in fisheries.<sup>13</sup> Consequently, they predict that creating such rights should, in principle, alter the fishers’ behavior voluntarily towards sustainment of the resource.<sup>14</sup> Others claim that private property rights are equally or more likely to motivate exploitation rather than stewardship. Thus, other legal mandates or constraints are required in order to ensure stewardship.<sup>15</sup> This paper will show that for socially beneficial stewardship behavior to exist, exclusive private ownership is neither necessary nor sufficient. It will be argued, however, that a regime which includes appropriately structured property rights

---

9. See also Seth Macinko & Sarah Schumann, *The Process of “Property”: Stasis and Change in Lobster Management in Southern New England*, 33 VT. L. REV. 73 (2008).

10. *Id.*

11. Such as New Zealand and Australia.

12. For example, Canadian and US common law treat ITQ licenses as property in some instances similarly to the division of estates and divorce

13. See e.g., Donald R. Leal, *Homesteading the Oceans: The Case For Property Rights in U.S. Fisheries*, PERC POL’Y SERIES, Aug. 2000, at 1-36, available at <http://perc.org/sites/default/files/ps19.pdf>; Ragnar Arnason, *A Review of International Experiences with ITQs (Annex to Future Options for UK Fish Quota Management)*, CEMARE REP. NO. 58, 1 (2002), <http://www.port.ac.uk/research/cemare/publications/pdf/files/reportspdf/filetodownload,103922,en.pdf>.

14. Arnason, *supra* note 13, at 1; Chu, *supra* note 2.

15. Bromley, *supra* note 6; Seth Macinko & Daniel W. Bromley, *Property and Fisheries for the Twenty-First Century: Seeking Coherence*, 28 VT. L. REV. 623, 646 (2004).

does provide effective incentives for socially beneficial stewardship, and is likely to require less enforcement effort and cost than regimes that provide no such rights. This does not, however, mean that stronger property rights are always better. Effective conservation actions often necessitate some limitations on the scope of the property rights that are conferred by ITQs.<sup>16</sup>

## II. THE NATURE OF ITQS

### A. Fisheries and “The Tragedy of the Commons”

The theory of the “tragedy of the commons”<sup>17</sup> explains how multiple individuals, acting independently and rationally on behalf of their own self-interest, can deplete a shared limited resource, even when each knows that it is not in his own interest, nor in anyone’s long-term interest.<sup>18</sup> The theory is widely known, but it can be argued whether it applies to certain specific situations. Fisheries, for example, have been described within the tragedy of the commons model but have significant limitations.<sup>19</sup> Even across different jurisdictions, the general economic theory of the tragedy of the commons applies because of the inherent nature of fisheries.<sup>20</sup> A fish stock is precisely this type of resource. The stock is shared, but (in the absence of any kind of regulation) each fisher owns only (and all of) those fish that he can catch. In English common law, this is known as the “rule of capture.”<sup>21</sup> In such a fishery, it will be in the interest of an individual fisher to acquire as much fish as he can, which he can then of course sell for private profit.<sup>22</sup> However, this will cause overfishing and exhaustion of the stock, which is not in anyone’s

---

16. These limitations are consistent with the FAO’s ecosystem approach to fisheries management which suggests that the government should be able to lower TACs if needed to conserve the resource, and not be impeded by other issues.

17. Garrett W. Hardin, *The Tragedy of the Commons*, 162 SCI. MAG. 1243 (1968).

18. *Id.* at 1243-1248.

19. See, e.g., Donald R. Leal, *Community Run Fisheries: Preventing the Tragedy of the Commons*, PROP. AND ENV’T RES. CTR., <http://perc.org/articles/community-run-fisheries-0> (last visited June 4, 2014).

20. Daniel Benjamin, *Fisheries are a Classic Example of the “Tragedy of the Commons,”* 19 PROP. & ENV’T RES. CTR. 1 (2001), available at <http://perc.org/articles/fisheries-are-classic-example-tragedy-commons>.

21. Anthony Scott, *Moving Through the Narrows: From Open Access to ITQs and Self-Government*, in USE OF PROPERTY RIGHTS IN FISHERIES MANAGEMENT 105 (Ross Shotton ed., 2000).

22. Macinko & Schumann, *supra* note 9.

interest.<sup>23</sup> Every member of the group suffers when the stock disappears.<sup>24</sup>

The tragedy of the commons applies to many environmental goods.<sup>25</sup> Not surprisingly, the tragedy of the commons has been widely recognized to exist in traditional open access fisheries,<sup>26</sup> although at times the predicted over exploitation never occurs due to a lack of demand created by a lack of access to markets. Most often, however, empirical evidence shows clearly that over-fishing has occurred.<sup>27</sup> This has led governments around the world to restrict access to fishing in an attempt to save the common property fish stock.<sup>28</sup> Proposed solutions usually include a permit system, in which the government either limits the rights of use or the conversion of the public good into private property. Thus, the permit system provides the individual with an incentive to maintain the property in good state.<sup>29</sup>

In most cases, the first step was the introduction of licenses.<sup>30</sup> This was quickly followed by strict conditions on the licenses, often including an aggregate catch limit or TAC for the entire fishery. However, problems continued to exist.<sup>31</sup> Fishermen developed strategies to evade restrictions on their licenses in order to catch the same amount of fish. For example, where fishing was reduced to a limited number of days per year, fishermen were quick to develop ways to fish in order to catch the same amount of fish within the reduced time period.<sup>32</sup> Similarly, when regulations for vessels were introduced, fishermen were quick to enhance their fishing nets, enabling themselves to catch the same amount of fish with their smaller vessels.<sup>33</sup> In other words, fishermen continued to find loopholes in the system that allowed them to continue overfishing.<sup>34</sup>

---

23. *Id.*

24. *Id.*

25. Patrick A. Nickler, *A Tragedy of the Commons in Coastal Fisheries: Contending Prescriptions for Conservation, and the Case of the Atlantic Bluefin Tuna*, 26 B.C. ENVTL. AFF. L. REV. 549, 576 (1999).

26. See, e.g., Elinor Ostrom, *A Diagnostic Approach for Going Beyond Panaceas*, 104 PNAS 15181, 15182-15183 (2007).

27. Chu, *supra* note 2 at 9.

28. Munro et al., *supra* note 5.

29. Christine Stewart, *Legislating for Property Rights in Fisheries*, FOOD AND AGRIC. ORG. OF THE UNITED NATIONS 4-5 (2004), available at <ftp://ftp.fao.org/docrep/fao/007/y5672e/y5672e00.pdf>.

30. See, e.g., *id.*

31. *Id.*

32. *Id.*

33. *Id.* at 4-5

34. *Id.*

*B. The Transition to Output Control and Individual Quotas*

Governments then started to restrict the amount of fish, and also entitlements to certain amounts of fish.<sup>35</sup> Thus, the regulatory approach shifted from input control (controlling the amount of effort, type of gear, etc.) to output control (controlling the amount of fish fishermen can catch).<sup>36</sup> Under an ITQ system, the regulator determines a total allowable catch (TAC) for each species of fish.<sup>37</sup> The TAC is then divided into individual quotas (IQs), which are allocated to individual fishers or organizations.<sup>38</sup> If regulations allow IQ holders to sell, buy or lease their quotas, then the quotas are individual transferable quotas, or ITQs.<sup>39</sup> Most but not all IQ schemes allow at least some trading to occur, and so most of these schemes are in fact ITQ regimes.<sup>40</sup> Trading quotas is generally justified on the grounds of economic efficiency. The fishermen with the lowest costs will be able to place the highest bids for the ITQs.<sup>41</sup>

Although ITQs are meaningless without a TAC, it is entirely possible to implement a TAC without ITQs. When a TAC is used without individual quotas, the regulator sets the TAC, and then allows licensed fishers to fish until the TAC has been caught in aggregate.<sup>42</sup> The regulator then closes the season, and any further fishing is prohibited until the next season opens.<sup>43</sup> This type of regulation has been widely used in many countries.<sup>44</sup> For example, the United States and Canada used this approach for several Pacific fisheries before the introduction of ITQs in the 1990s.<sup>45</sup> Unfortunately, this type of regulation has failed in many ways. It has not effectively prevented overfishing<sup>46</sup>, yet has caused considerable economic hardship for fishers.<sup>47</sup>

To understand the reasons why many researchers predict that ITQs will help to prevent fisheries from falling victim to the tragedy of the commons, consider the difference between TAC-based regimes without

---

35. Suzi Kerr, James Sanchirico & Richard Newell, *Evaluating the New Zealand Individual Transferable Quota Market for Fisheries Management*, (Motu Working Paper No. 2003-02), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=441061](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=441061).

36. *Id.*

37. Stewart, *supra* note 29.

38. *Id.*

39. *Id.*

40. *Id.*

41. *Id.*

42. Arnason, *supra* note 13.

43. *Id.*

44. *Id.*

45. Munro et al., *supra* note 5.

46. The enforcement by the regulators was not as stringent as that of IQs.

47. Munro et al., *supra* note 5, at 6-13.



IQs and those with IQs. Where a TAC is not divided into individual shares, each fisher is entitled only to whatever amount he can catch before the total fleet reaches the TAC.<sup>48</sup> This situation, called the “race to fish”, forces every fisher to catch as much as he can as quickly as he can, regardless of what effect this may have on the health of the stock.<sup>49</sup> No fisherman can afford to take any action that would help protect the stock if that action would slow down his catch rate.<sup>50</sup> If he did, the direct result would be a reduction in his total catch and his total profit. In contrast, where a TAC is divided into IQs, each fisher is entitled to that share regardless of how long he takes to catch it, and regardless of the actions of the rest of the fleet.<sup>51</sup> Therefore, actions that would help protect the stock are not automatically penalized.<sup>52</sup>

Furthermore, because an ITQ is a percentage share of a TAC, and the TAC can change from year to year, it is in each fisherman’s self-interest to take actions that will increase the TAC in future years by increasing the size and value of his share.<sup>53</sup> In theory, this should motivate a fisherman to voluntarily avoid cheating (that is, catching more than the quantity allowed today by his ITQ), because such cheating might reduce the future TAC, and therefore reduce the future quantity he can catch under the same ITQ.<sup>54</sup> This paper will focus on whether this theory actually works to encourage sustainable fishing practices. Before addressing that question, however, it is necessary to understand the legal issues surrounding ITQs. Do they confer property rights on their holders, and if so, to what extent? The next section discusses the nature of property rights in general, and then analyzes ITQs in that context.

### III. PROPERTY RIGHTS AND ITQs

#### *A. The Nature of Property Rights*

Many questions have arisen regarding the legal status of ITQs, and whether they can be considered property.<sup>55</sup> Property rights have been

---

48. Christopher Costello et al., *Can Catch Shares Prevent Fisheries Collapse?*, 321 SCI. MAG. 1678, 1679 (2008).

49. *Id.*

50. Colin W. Clark, *The Economics of Overexploitation*, 181 SCI. MAG. 630 (1973).

51. Dale Squires et al., *Individual Transferable Quotas as a Fisheries Management Tool*, 3 REV. FISHERIES SCI. 141-169 (1995).

52. *Id.*

53. Leal, *supra* note 19.

54. *Id.*

55. Bromley, *supra* note 6.

widely defined and discussed.<sup>56</sup> Many different interpretations exist.<sup>57</sup> One of the most influential interpretations holds that “property” is a bundle of rights, and that individual rights within this bundle can be separated, transferred, removed or added.<sup>58</sup> This means that several rights of property may be attached to a single good.<sup>59</sup> For example, one party may own a house, but if the owner decides to rent it out, then the tenant may also have rights with respect to that same house. Though the owner retains ownership, the tenant has the right to occupy and use the premises to the exclusion of others.

Property is generally understood, in the legal context, as a bundle of rights associated with some asset, either tangible or intellectual.<sup>60</sup> One of the general assumptions of capitalism is that the capacity to own and “hold” property provides incentives to improve property, generating wealth.<sup>61</sup> This understanding is the basis for the legal system that seeks to balance the interests of the property holder with the rest of society. The result of this is what has been called the “crystals” and the “mud” of property law.<sup>62</sup> These are the hard-edged, well defined areas of the law, such as what is required for the sale of a piece of property under the law, and the less defined and harder to fully understand areas. ITQs fall into this latter camp; they are occasionally treated as though they were property, and occasionally are not.

One of the classic definitions states that “ownership” is composed of the following rights: (1) possession, management and control; (2) income and capital; (3) transfer *inter vivos* and on death; and (4) protection at law (for example, from expropriation).<sup>63</sup> It is also recognized that ownership often comes with duties as well as rights,<sup>64</sup> for example, ownership of a firearm. More importantly, the classic definition states that the rights are not necessarily unfettered and that ownership may, for example, not be immune from expropriation or seizure.<sup>65</sup> Also, different bundles of rights may exist, and what is recognized as property

---

56. Stewart, *supra* note 29.

57. *Id.*

58. See J.E. Penner, *The Bundle of Rights' Picture of Property*, 43 UCLA L. R. 711 (1996); ZIFF, *supra* note 7, at 2.

59. *Id.*

60. *Id.*

61. See, e.g., Sony Pellissery & Sattwick Dey Biswas, *Emerging Property Regimes In India: What It Holds For the Future of Socio-Economic Rights?*, (Nov. 22, 2012), available at [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2179717](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2179717).

62. Carol M. Rose, *Crystals and Mud in Property Law*, 40 STAN. L. REV. 577, 577-579 (1988).

63. ZIFF, *supra* note 7 at 2-3.

64. *Id.*

65. *Id.*

under private law, for example, may not receive the same recognition or protection under criminal law.<sup>66</sup> In Canada, for example, the Supreme Court determined in *Delgamuukw v. British Columbia* that aboriginal title is *sui generis*, meaning “of its own kind”, or unlike any normal kind of title.<sup>67</sup> This concept is relatively unique to Canada, but has some interesting implications. In making this ruling, the Court noted several differences between aboriginal title and non-aboriginal title.<sup>68</sup> For one thing, the range and uses of aboriginal title land is limited to the uses that “must not be irreconcilable with the nature of the attachment to the land, which forms the basis of the particular group’s aboriginal title.”<sup>69</sup> In addition, aboriginal title is inalienable, except to the Crown.<sup>70</sup> A community can only hold aboriginal title. Aboriginal title is constitutionally protected.<sup>71</sup>

As entitlements to property need to be judicially recognized in order for property rights to be enforceable, it is the legislature and/or the courts that validate property claims.<sup>72</sup> The other extreme that has been argued includes Brubaker’s claim that the best methodology for protecting nature is through “a system of exclusive, transferable rights that has vested decision-making authority in individuals and firms who own or occupy land.”<sup>73</sup>

These property and proprietary interests can result in a variety of different situations aside from those previously mentioned. Different types of proprietary “interests” also exist that fall short of true ownership. They fall short because they, for one reason or another, do not provide the full body of rights associated with legal ownership. ITQ licenses fail to compensate individuals for the loss of their property if the ITQ rights change or the ITQ is revoked. These “interests” are generally recognized in jurisdictions worldwide, although perhaps under different names. They include:

---

66. *Id.* at 3-4.

67. *Delgamuukw v. B.C.*, [1997] 3 S.C.R. 1010, 1014 (Can.).

68. *Id.*

69. *Id.*

70. *Id.*

71. *Id.*

72. ZIFF, *supra* note 7. Therefore, ‘what is’ a property may very well depend on the jurisdiction in which such right is claimed. Ziff distinguishes two different approaches used by courts in their analysis of property rights. One is the ‘attributes approach’, which has a court look at the elements of the rights in order to determine whether they fit the property picture; the other approach is the ‘purpose’ approach, which very much reflects the needs of society.

73. ELIZABETH BRUBAKER, PROPERTY RIGHTS IN THE DEFENCE OF NATURE 19(1995).

(a) *Incorporeal hereditaments*: these are rights to have access to, or to exploit certain land resources.<sup>74</sup> Easements and *profits a prendre* are two of the more familiar examples.<sup>75</sup> Easements are generally defined as the right to cross or otherwise use someone else's land for a specified purpose.<sup>76</sup> Easements most commonly appear in cases of adjoining lands, where the owner of one land needs to cross the other owner's land to gain access to a public road.<sup>77</sup> Easements cannot be revoked once granted, as they are proprietary interests.<sup>78</sup> They can be enforced both against the grantor and third parties.<sup>79</sup> *Profits a prendre* are such interests as mineral rights or water rights, which allow the grantee to take specific types of natural produce from another's land.<sup>80</sup> *Profits a prendre* are more flexible, in that any kind of use of the land can be granted, whereas easements are primarily rights to passage.<sup>81</sup>

(b) *License*: A license is a permit from an authority to own or use something, do a particular thing or carry on a trade. Common examples are alcohol or weapons license. There are four types of licenses: (i) bare licenses, (ii) contractual licenses, (iii) licenses by proprietary estoppels, and (iv) licenses coupled with an interest.<sup>82</sup>

As different legal concepts which represent partial interests to land, they receive different protections under the law.

### B. Community Property Rights

The concept of communal property rights can be contrasted with individual property rights. In Canada, this question frequently arises in the context of property rights in aboriginal communities,<sup>83</sup> with a key difference being how the property rights are allocated. Each individual member of the community is generally able to access the property in question, and management is generally operated through the community

---

74. Daniel K. Brough, *Alternatives in Accretion: Why There Is Not Yet an Appropriate Solution to the Application of Accretion Law to Mineral Estates*, 2004 BYU L. REV. 169, 204 (2004).

75. *Id.*

76. *Builders Supplies Co. of Goldsboro, N. C., Inc. v. Gainey*, 282 N.C. 261, 192 S.E.2d 449 (1972).

77. Henry E. Smith, *The Language of Property: Form, Context, and Audience*, 55 STAN. L. REV. 1105, 1110 (2003).

78. *Greenwood v. Rahill*, 122 R.I. 759, 412 A.2d 228, 230 (1980).

79. S.H. GOO & ALICE LEE, *LAND LAW IN HONG KONG* 664 (3d ed. 2009).

80. ZIFF, *supra* note 7.

81. However, conservation easements were created as a way to compensate landowners for restricting the use and development of their property. See generally Bill Garber, *Conservation Easements: Growth, Abuses, and Regulation*, 72 APPRAISAL J. 175 (2004).

82. GOO & LEE, *supra* note 79.

83. See, e.g., *Delgamuukw v. B.C.*, [1997] 3 S.C.R. 1010, 1014 (Can.).

as a whole. This situation results in a number of different structural and management choices, the analysis of which would constitute a paper in and of itself.

Communal property rights provide an alternate methodology through which property rights and ITQs can be considered. The Alaskan Community Quota Entities (CQE)<sup>84</sup> is an example of just this model; the community is able to hold the ITQ as though it were a piece of property communally held and it is able to manage it in their own way. Other than adding what is, conceptually, an additional layer of management in the form of the community, the communal property rights system differs little from an individual holding property rights. What this does show, however, is that ITQs can function as a piece of property in both a communal and a private context.

### C. ITQs as Property Rights

With respect to ITQs and property, the most fundamental question is whether an ITQ confers full ownership of “property” upon the holder, or rather a “proprietary interest” such as a license coupled with a *profit a prendre*. In 2004, the UN’s Food and Agriculture Organization (FAO) analyzed the nature of ITQs and their relation to property rights.<sup>85</sup> The FAO’s objective was to help legislators carefully and correctly define ITQs so as to avoid undesired results, such as costly and time-consuming compensation claims upon revocation of rights, or full property rights claims.<sup>86</sup> The FAO concluded that although ITQs can be effective tools to limit the environmental impacts of fishing, they have a variety of societal effects which may be concerning.<sup>87</sup>

According to the study, the key features of property are: (1) a judicial relationship that exists between a person and a thing; (2) privileges and powers that are open-ended (they cannot be finitely listed); and (3) a holder that is entitled to self-seekingness (the holder can derive profit or other benefit from the property).<sup>88</sup> If any of these three features is absent, there is no full property right.<sup>89</sup> The study then

---

84. For example, the Community Quota Entities (CQE) in Alaska, as defined in the Federal Fisheries Regulation. See 50 C.F.R § 679.2.

85. Stewart, *supra* note 29.

86. *Id.*

87. Evelyn Pinkerton & Danielle N. Edwards, *The Elephant in the Room: The Hidden Costs of Leasing Individual Transferable Fishing Quotas*, 33 MARINE POLICY 710 (2009).

88. Stewart, *supra* note 29.

89. *Id.* at 9-10.

examined what happens if any of these elements is absent, and established two categories of non-ownership situations:<sup>90</sup>

1. “Quasi-ownership interests” exist in the absence of self-seekingness.<sup>91</sup> For example, public officials in public agencies are not self-seeking—the public derives the benefit, not the official. Nevertheless, these officials have an interest in whatever they oversee, which is analogous to ownership in some respects.
2. “Non-ownership proprietary interests” lack open-endedness because their content is limited.<sup>92</sup> These interests are usually created for a very specific purpose so that only very specific rights and powers are created with regard to the good.<sup>93</sup> The study further breaks this category down into three types of interest:
  - (a) rights to enjoy some specifically granted category of the use privileges that are included in the original ownership (i.e. *profit à prendre* and easements);
  - (b) rights to deny the owner of some of his use privileges (i.e. the right to light and the right to support); and
  - (c) rights to subtract some monetary value out of the wealth potential of the resource (i.e. mortgages and charges).<sup>94</sup>

In fisheries, ITQ schemes are private property regimes to the extent that a fisher who holds a share of the TAC has an exclusive right to harvest that part of the annual catch of fish.<sup>95</sup> They differ from fishing rights or licensing schemes under which mere “privileges” (such as permits for fishing activities) are granted.<sup>96</sup> In these licensing schemes, ownership fully remains with the public as represented by the government, and mere rights to use are granted.<sup>97</sup> These rights to use are not exclusive or transferable.<sup>98</sup> ITQs, in contrast, provide exclusive rights to harvest.<sup>99</sup> It is this authorization (rather than the fish) that can be sold,

---

90. *Id.* at 10.

91. *Id.*

92. *Id.*

93. *Id.*

94. *Id.*

95. Macinko & Bromley, *supra* note 15.

96. *Id.*

97. *Id.*

98. *Id.*

99. Stewart, *supra* note 29, at 15.

leased and dealt with by the holder<sup>100</sup>; therefore, property rights may exist with regard to the quota, which is the exclusive right to harvest.<sup>101</sup>

The right to harvest is far from unlimited.<sup>102</sup> In a bid to protect the natural resource at stake, nations restrict and limit this entitlement.<sup>103</sup> If the natural resource continues to deplete, states will generally wish to be able to revoke or reduce these harvest rights.<sup>104</sup> In order to avoid lengthy procedures and allow for swift management, such restrictions are usually laid down in law. The ITQ is framed in such a way as to avoid recognizing it as “property” in a legal sense<sup>105</sup>; some laws speak of “quotas,” some describe the rights as “quotas allocated to a license,” and others confer “entitlements” under “licenses or permits.”<sup>106</sup>

Even though it is clear that “full” property rights are never granted, the result of these descriptions is usually that the rights are ambiguous and open to interpretation—coincidentally, much like actual property rights.<sup>107</sup> The effort to avoid recognition as “property” is the reason why quotas are usually granted for free; governments generally want the ITQ to be seen as a restricted license, permit or quota—that is, as a proprietary interest that does not amount to full ownership—and fear that the payment of a fee for such entitlement could give rise to monetary claims in case of later expropriation, revocation or reduction of that entitlement.<sup>108</sup>

There also appears to be a correlation between the presence of legislation requiring compensation for deprivation of property and the desire to avoid giving property right status to ITQs.<sup>109</sup> In the US, where a requirement for such compensation is enshrined in the Constitution, legislation explicitly states that quotas are not property.<sup>110</sup> In New Zealand, where no such constitutional requirement exists, more extensive property rights are granted using quotas.<sup>111</sup>

---

100. *Id.*

101. *Id.*

102. FOOD & AGRIC. ORG. OF THE U. N., THE ECOSYSTEM APPROACH TO FISHERIES: ISSUES, TERMINOLOGY, PRINCIPLES, INSTITUTIONAL FOUNDATIONS, IMPLEMENTATION AND OUTLOOK 443 (2003), available at [http://ocean.floridamarine.org/efh\\_coral/pdfs/Ecosystem\\_Approaches\\_to\\_Fisheries\\_FAO.pdf](http://ocean.floridamarine.org/efh_coral/pdfs/Ecosystem_Approaches_to_Fisheries_FAO.pdf).

103. *Id.*

104. *Id.*

105. *Id.*

106. *Id.* at 16.

107. Leal, *supra* note 19.

108. *Id.*

109. *Id.*

110. See Magnuson-Stevenson Fishery Conservation and Management Act, 16 U.S.C. § 1853a (2006).

111. Stewart, *supra* note 29, at 4-5.

The study identifies New Zealand and Iceland as the two countries with the most comprehensive ITQ legal frameworks.<sup>112</sup> New Zealand has a Quota Register that works much like a land title register, retaining documentation relating to ownership, mortgagee or caveator rights of ITQs.<sup>113</sup> Furthermore, the statute explicitly states that quota holders are entitled to compensation should their quota be terminated.<sup>114</sup> The quotas can also be freely transferred. Finally, the quotas are explicitly permanent in nature, although the quantum of allocation depends on the annual TAC.<sup>115</sup>

The New Zealand system contrasts starkly with the situation in the USA, for example, where legislation explicitly provides that ITQs do not create any kind of property right, and that no compensation is payable in case of revocation of the rights.<sup>116</sup> US legislation describes ITQs explicitly as permits only.<sup>117</sup> Stewart summarizes this system as “based on the concepts of the people’s ownership of the resource, the government’s sovereign right to conserve and manage it, and an open-access regime.”<sup>118</sup> Many have argued that the right granted by the United States is more of a “revocable privilege” than any kind of property right.<sup>119</sup>

Canada, similarly, is reluctant to grant property status to ITQs.<sup>120</sup> Its legislation therefore explicitly states that no property rights are granted and refers, *inter alia*, to a buy-back scheme rather than “compensation,” as compensation is normally reserved for expropriation of property. Canadian legislation explicitly defines licenses as a “privilege,” not as “property.”<sup>121</sup>

However, legislation is not the only relevant consideration as the courts may establish precedents in case law that differ from the intentions of the legislators.<sup>122</sup> The FAO study notes that licenses that are (1) permanent; (2) exclusive; (3) transferable; and (4) secure are

---

112. *Id.*

113. *Id.*

114. New Zealand Fisheries Act 1983, 27 R.S.N.Z. § 2 & 28ZA (1991).

115. *Id.*

116. Stewart, *supra* note 29.

117. *Id.*

118. *Id.* at 86.

119. *See, e.g.,* Leal, *supra* note 13; Arnason, *supra* note 13, at 14-25.

120. BEIJER INT’L INST. OF ECOLOGICAL ECON. & THE WORLD BANK, PROPERTY RIGHTS AND THE ENVIRONMENT: SOCIAL AND ECOLOGICAL ISSUES 91 (Susan Hanna & Mohan Munasinghe eds., 1995).

121. David G. Henley, *The Property Status of Fishery Licences*, 28 Dalhousie L. J. 501, 502-503 (2005); New Zealand Fisheries Act 1983, 27 R.S.N.Z. §§ 2, 28ZA (1991).

122. Stewart, *supra* note 29, at 11.



considered very similar to property rights by some courts.<sup>123</sup> However, most fishing rights and licenses only carry some of these characteristics, and only carry them to a certain extent.<sup>124</sup>

The precise status of fishing rights depends in part on the statute under which they are created.<sup>125</sup> Some courts, however, have distinguished different scenarios; protection of the right between private parties, in contrast to protection of the right between a private party and the state.<sup>126</sup> Often, courts have been much more willing to find that property rights exist in the first scenario than in the second.<sup>127</sup> Finally, even in regard to these questions, courts hold different views, stemming mostly from property doctrines and relevant constitutional provisions.<sup>128</sup>

Historically, it has been recognized that property in fish is vested in the public.<sup>129</sup> This was also established in the leading US case of *Arnold v Mundy*,<sup>130</sup> which found that the property in navigable waters and the submerged lands beneath them was vested in the sovereign, not for the sovereign's use but for the use of citizens.<sup>131</sup> However, largely in response to the reality of over-fishing, it has also been recognized that this public property right is subject to abrogation by statute.<sup>132</sup>

Stewart also points out that it is necessary for states to classify fishing rights as less than property rights, as anything else would violate the rule of *nemo dat quod non habet*, which holds that no one can give what he does not have (own).<sup>133</sup> As the property of fish lies with the public rather than with the government itself, the legislator is not authorized to transfer such property.<sup>134</sup> This problem is avoided when the state hands out licenses and permits rather than full property rights.<sup>135</sup>

In New Zealand, courts treated ITQs as property to some extent, with the court in *Jensen v. Director-General of Agriculture and Fisheries & The Quota Appeal Authority*,<sup>136</sup> classifying ITQs as "valuable assets."

---

123. *Id.*

124. *Id.*

125. *Id.* at 13.

126. *Id.* at 14-17.

127. *Id.* at 16.

128. *Id.* at 103.

129. *See, e.g.*, Harper v. Minister for Sea Fisheries & Others, 168 CLR 314 (Tasmania, 1989).

130. *Arnold v. Mundy*, 6 N.J.L. 1 (1821), as confirmed by *Martin v. Waddell's Lessee*, 41 U.S. 367 (1842).

131. *Id.*

132. Harper v. Minister for Sea Fisheries & Others, 168 CLR 314 (Tasmania, 1989).

133. Stewart, *supra* note 29, at 90.

134. *Id.*

135. *Id.*

136. *Jenssen v. Director-General of Agriculture and Fisheries & The Quota Appeal Authority* (unreported) CA 313/91 (N.Z.).

However, it has also been held that ITQs can be revoked without an entitlement to compensation.<sup>137</sup> The Court of Appeals in *New Zealand Federation of Commercial Fishermen Inc. v. Minister of Fisheries*<sup>138</sup> described fishing rights as a “species of property” that is subject to the provisions of the legislation which creates them.

Australia has granted limited property right status to ITQs. In *Edwards v. Olsen*<sup>139</sup>, the Court held that licenses were clearly property, “absent some express statutory provision to the contrary,” because licenses are transferable.<sup>140</sup> The approach in *Edwards* was slightly different than the approach in cases between private parties and the state. In the leading case, *Harper v. Minister for Sea Fisheries & Others*<sup>141</sup>, fishing rights were considered “akin” to full property rights and were said to be like *profit a prendre*, but ultimately were not considered full property rights. As they are not full property rights, they are subject to uncompensated revocation if necessary.<sup>142</sup>

US courts, on the other hand, tend to treat ITQs as not being a form of property. One case described ITQs as “transferable permits to fish for a fixed percentage of the annual aggregate catch quota for the species and area.”<sup>143</sup> The court in *Foss v. National Marine Fisheries Service*<sup>144</sup>, took a somewhat different approach; it classified the ITQ permit as “property,” but simultaneously stated that there was no property claim in the fish themselves.

Like the US, Canada has usually been reluctant to treat ITQs as property. In *Saulnier v. Royal Bank of Canada*<sup>145</sup>, the Supreme Court considered that a fishing license was not property under common law, but rather a license coupled with a proprietary interest in the harvest. Nevertheless, considering then the “major commercial” value of the license and the fact that they can be sold and leased, it held that these licenses were property within the (limited) meaning of the Banking and

---

137. *Cooper v. Attorney-General*, [1996] 3 NZLR 480 (N.Z.). Note that unlike other jurisdictions, there is no Constitutional provision in New Zealand stating that property can be deprived only against payment of compensation.

138. *New Zealand Federation of Commercial Fishermen Inc. v. Minister of Fisheries*, CP237/95, Appeal CA 82/97, CA 83/97, CA 96/97.

139. *Edwards v. Olsen* (1996) 67 SASR 266; [1996] SASC 5703 (Austl.).

140. *See Kelly v. Kelly* (1990) 92 ALR 74 (Austl.).

141. *Harper v. Minister for Sea Fisheries & Others*, 168 CLR 314 (Tasmania, 1989).

142. *Id.*

143. *Sea Watch Int'l v. Mosbacher*, 762 F. Supp. 370, 373 (D.D.C. 1991).

144. *Foss v. Nat'l Marine Fisheries Serv.*, 161 F.3d 584, 588 (9th Cir. 1998).

145. *Saulnier v. Royal Bank of Canada*, [2008] SCJ No 60, [2008] SCR 166.

Insolvency Act.<sup>146</sup> This implies that the licenses (which, it should be noted, are not ITQs) are proprietary interests at the least.

The property rights status of Canadian ITQs was also tested in *Malcolm v. Canada (Minister of Fisheries)*. In this case, Graeme Malcolm, on behalf of all commercial halibut license holders, sought judicial review of a decision by the Minister of Fisheries to change the split of TAC from 88% commercial with 12% recreational to 85% commercial with 15% recreational.<sup>147</sup> The reduction in ITQs held by the license holders resulted in fewer pounds of halibut that could be landed and sold by the applicant and other commercial fisherman.<sup>148</sup> The parties to this lawsuit agreed that the appropriate scope of review was reasonableness, putting the question to the court as to whether the Minister's action was purely administrative, a policy decision, or a political decision (which would not be justiciable).<sup>149</sup> This was an application of *Dunsmuir v. New Brunswick*, which described reasonableness as a flexible deferential standard that varies with the context and the nature of the impugned administrative act.<sup>150</sup> The applicant claimed that the action was primarily legislative in nature (thus, justiciable), and sought to utilize the doctrines of both promissory estoppel and legitimate expectations to further the claim.<sup>151</sup> The court found both of these to be inapplicable to the current case.<sup>152</sup> Promissory estoppel did not apply because although the applicant established that he and other commercial license holders relied upon representations by the Minister, which was not sufficient because promissory estoppel cannot prevent a minister from exercising a broad statutory mandate to act in the public interest.<sup>153</sup> Similarly, legitimate expectations can only be used to challenge the process used to make the decision, not the ultimate result.<sup>154</sup> This case confirmed the power of the Minister to make changes to the TAC and alter the distribution if the need necessitates.<sup>155</sup> This change can be done without court interference and is further proof that ITQs in Canada do not confer full ownership because the court has, in

---

146. *Id.*

147. *Malcom v. Minister of Fisheries and Oceans*, [2013] F.C. 363 (Can.).

148. *Id.*

149. *Id.*

150. *Dunsmuir v. New Brunswick*, [2008] S.C.R. 190 (Can.).

151. *Malcom v. Minister of Fisheries and Oceans*, [2013] F.C. 363 (Can.).

152. *Id.*

153. *Id.*

154. *Id.*

155. *Id.*

effect, held that they are privileges that can be revoked without compensation.<sup>156</sup>

Furthermore, in the Canadian case of *Knowles Estate v. Knowles*,<sup>157</sup> the main point of contention between the parties asked who was entitled to benefit from the sale of the late Carl Alvin Knowles' fishing licenses. The Court held that the fishing licenses were not marital property under the *Matrimonial Property Act*,<sup>158</sup> but nevertheless were "business assets" which could be divided under section 22 (2.1) of the *Devolution of Estates Act*<sup>159</sup>. There is a general similarity between this finding and the Supreme Court's decision in *Saulnier*; both courts did not consider licenses to be "property" in the full sense, but found that they were subject to certain provisions of certain specific statutes.

When comparing case law from different jurisdictions, it is necessary to consider the different contexts in which these cases arise.<sup>160</sup> The precise nature of the property right involved is seldom the turning point of a case. More often, property rights are discussed as a point of no ultimate legal significance.<sup>161</sup> Rather than, for example, granting fishers certain rights so as to improve their security in relation to that right, many cases focus on the possibility of granting secure proprietary interests to third parties, such as moneylenders.<sup>162</sup> As a result, the question of property is considered in relation to different laws, from differing perspectives and for different purposes, which leads to multiple and differing interpretations.<sup>163</sup>

Stewart concludes that ITQs do not constitute full private ownership<sup>164</sup>; the characteristics of transferability (whether the property can be transferred), exclusivity (whether the owner is able to exclude others from the use of the good), security (whether the entitlement can be revoked or determined by the state) and durability (whether ownership is unlimited in time and doesn't expire) are not present to their fullest degree.<sup>165</sup> However, ITQs do have certain qualities in common with full property rights, such as the fact that they can be leased and sold.<sup>166</sup> Most

---

156. *Id.*

157. *Knowles v. Knowles*, [2011] NBQB 43 (Can.).

158. *Matrimonial Property Act*, R.S.A 2000, c. M-8 (Can.).

159. *Devolution of Estates Act*, RSNB 1973, c. D-9 (Can.).

160. Stewart, *supra* note 29.

161. *Id.*

162. *See, e.g., Saulnier v. Royal Bank of Canada*, [2008] SCJ No 60, [2008] SCR 166.

163. Stewart, *supra* note 29.

164. *Id.*

165. *Id.*

166. *Id.*

jurisdictions recognize that quotas are at least a form of *profit à prendre*, and in some cases, somewhat more.<sup>167</sup> Sometimes, they are even (confusingly) considered “property” for such purposes as insolvency legislation, as in the *Saulnier* case from Canada.<sup>168</sup> Nevertheless, because of the limitations on security and durability, quotas are more accurately described as “non-ownership property interests,” than as complete property rights that are tantamount to full ownership.<sup>169</sup>

#### *D. Driesen’s Criticism of Property Rights*

Many researchers have criticized the use of property law to attempt to solve environmental problems. Driesen posits that property is often utilized as a force for stability within economic systems, but that modern property law often undervalues social functions of property.<sup>170</sup> These concepts are further developed in the Coase Theorem<sup>171</sup>, which states that property is a legal concept that serves only to provide value to assets so negotiation can occur.<sup>172</sup> This supports Driesen’s view that property is a tool for stabilizing complex economic systems. The result of these positions is that private property rights are focused rights with which an economic value can be associated, rather than the social concepts of ownership. This conceptualization, however, requires that a consequence of an action be known in order for that consequence to be reflected in the economic valuation. An example is the difficulty of obtaining complete knowledge about environmental effects, which results in these effects being ignored when the value of a piece of property is determined. The value of a given amount of quota under an ITQ system, for instance, depends on whether the TAC is correct—something which is rarely knowable with certainty.

Driesen’s view that property cannot address the environment is based on his view of the inherent purpose of property. Driesen suggests that property is merely a method of associating value for negotiation and for the assignment of scarce assets throughout society.<sup>173</sup> Driesen’s theory of property rights is not inconsistent with communal rights, however. Nevertheless, if this concept of property is used to address environmental issues, Driesen predicts that it will fail because of market

---

167. *Id.*

168. *Saulnier v. Royal Bank of Canada*, [2008] SCJ No 60, [2008] SCR 166.

169. Stewart, *supra* note 29.

170. DAVID DRIESEN, *THE ECONOMIC DYNAMICS OF LAW 7* (Cambridge Univ. Press 2012).

171. Ronald H. Coase, *The Problem of Social Cost*, 3 J. L. & ECON. 1, 1-44 (1960).

172. DRIESEN, *supra* note 178.

173. *Id.*

inefficiencies. Although Hardin's model identifies systemic risks to the system, what it fails to do is determine what would happen if the herders were entirely unaware as to how the environment would be affected by their actions. The situation in most fisheries is not that fishers suffer from a complete lack of knowledge, but rather that there is incomplete knowledge that can still address the problem at hand. Perfect knowledge is not required to be able to extrapolate the safe levels of fishing required, and the herder's assumption that is used as a criticism of the Hardin model does not apply, particularly when the resources of a government can be used to address the informational problems.

#### IV. EVALUATING ITQS

##### *A. Introduction*

Researchers and academics are engaged in an important debate about whether property rights and ITQs are an effective and cost-efficient method of preventing over-fishing and maintaining sustainable fisheries.<sup>174</sup> This debate is made even more complex by the multiple definitions of "property rights," described in the previous section.<sup>175</sup> In many cases, different researchers reach different conclusions and hold different opinions because they have unwittingly used different definitions of "property rights" and "ownership."<sup>176</sup> As a result, many of the arguments are difficult to analyze, and even more difficult to resolve.<sup>177</sup>

The following subsections first describe the arguments against ITQs as an effective means of promoting sustainability, as expressed by Daniel Bromley.<sup>178</sup> The next subsection unpacks the arguments in favor of ITQ's for promoting sustainability. Following this section, a short discussion of some criticisms of ITQ's, unrelated to sustainability, but arise as a result of viewing ITQ's as property rights.

##### *B. Bromley's Criticisms of ITQs for Sustainability*

Daniel Bromley's 2009 paper 'Abdicating Responsibility' attacked many earlier studies that supported and promoted ITQs.<sup>179</sup> Bromley argued that

---

174. George J. Mannina, Jr., *Is There A Legal and Conservation Basis for Individual. Fishing Quotas?*, 3 OCEAN & COASTAL L. J. 5, 49 (1997).

175. *Id.*

176. *Id.*

177. *Id.*

178. Bromley, *supra* note 6, at 281.

179. *Id.*

it was a “myth” to claim that a fishery can be sustained using a free market system without government intervention. In his view, a system with catch share allowance requires government intervention and management in order to function well.<sup>180</sup> His arguments are based on what he calls the ‘five core deceits’ of fisheries’ policy.<sup>181</sup>

- (1) Over-fishing can be blamed on missing property rights;
- (2) Private ownership is necessary and sufficient for socially beneficial stewardship;
- (3) ITQs must be of infinite life and freely tradable in order to produce the desired efficiency and stewardship properties;
- (4) ITQs are private property; and
- (5) ITQs are necessary and sufficient to produce efficiency, and to maximize resource rent, in a fishery.<sup>182</sup>

Bromley correctly points out that many economists use terms such as “property rights” and “ownership” vaguely and inconsistently.<sup>183</sup> Stated earlier in this paper, using vague and inconsistent terms is a common problem that makes it difficult to understand, compare and analyze arguments. It also tends to create and intensify disagreements. Unfortunately, Bromley does not state a detailed and specific definition of “property rights” either, making his reasoning no easier to work with than the arguments of those whom he criticizes.<sup>184</sup>

With respect to the first “core deceit,” Bromley neglects to present any argument showing why he believes to be false.<sup>185</sup> As stated earlier in this paper, the view that over-fishing is a result of missing property rights is based on the theory of the “tragedy of the commons.”<sup>186</sup> According to this theory, when fishers have rights to any fish that have not been caught, fishers act out of self-interest and seek to catch every possible fish before someone else can.<sup>187</sup> In order to show that this claim is, or could be, a “deceit,” Bromley needs to outline the reasoning and then show how it is flawed. He does neither.<sup>188</sup>

---

180. *Id.*

181. *Id.*

182. *Id.*

183. *Id.* at 282.

184. *Id.*

185. *Id.*

186. Nickler, *supra* note 25.

187. Hardin, *supra* note 17.

188. Bromley, *supra* note 6 at 281.

Bromley offers an alternative explanation for over-fishing: people over-fish because “their desire for the control of future value exceeds the rate at which a renewable natural resource can produce future value.”<sup>189</sup> While this is almost certainly true, it is little more than a restatement of one of the fundamental assumptions of economics, which is that people will always prefer more value to less. Therefore, it is true about any economic actor in any situation. It does not explain why fisheries are so often over-fished while other economic activities appear to be sustainable without significant intervention.

Bromley further claims that over-fishing can be (and should be) prevented, not by applying property rights, but by imposing constraints and penalties.<sup>190</sup> In principle, this is true. Sufficiently intense (and costly) enforcement can probably preserve a fish stock. Bromley’s evidence, unfortunately, refutes his claim rather than supports it. He says: “Human societies, over a rather long history, have figured out how to prevent all manner of unwanted activities and outcomes—from child pornography to organized dog fighting,”<sup>191</sup> and, argues that the same approach can work to prevent over-fishing. Unfortunately for Bromley’s argument (and for all of us), child pornography and organized dog fighting are both alive and well, despite society’s best efforts.

Bromley’s second “core deceit” is partly a restatement of the first.<sup>192</sup> The first “deceit,” according to Bromley, is the claim that over-fishing is caused by the absence of property rights.<sup>193</sup> This is equivalent to a claim that property rights are necessary to prevent over-fishing, and this is half of the second “deceit.” In full, Bromley’s second “deceit” is the claim that property rights are both necessary and sufficient for preventing over-fishing.<sup>194</sup>

Bromley first claims that property rights are not necessary; according to him, the only necessary condition for sustainability is that “a renewable resource will be used (“drawn down”) at a rate that does not diminish its capacity to reproduce itself in subsequent time periods.”<sup>195</sup> While this is true, it is little more than a definition of sustainability. It does not address the question that economists and fisheries managers are interested in, which is *how* this goal is best achieved. According to Bromley, private property is not necessary to

---

189. *Id.*

190. *Id.*

191. *Id.*

192. *Id.*

193. *Id.*

194. *Id.*

195. *Id.* at 282.



achieve this goal. For example, users do not deplete timber resources in the US, to which no private property rights are granted.<sup>196</sup>

Bromley also argues that private ownership is not sufficient because a private owner will prefer to derive income now rather than in the future, and, therefore, will exhaust the resource.<sup>197</sup> As evidence for this, he points to the fact that even though land is privately owned, laws such as the Washington State Forest Practices Act,<sup>198</sup> and government agencies such as the Soil Conservation Bureau, are often required to protect the land and its produce. If private ownership were sufficient to ensure good stewardship, then such interventions would be redundant.<sup>199</sup>

As further evidence that private ownership is not sufficient in itself, Bromley points to the fact that most ITQ schemes involve substantial enforcement efforts, such as mandatory cameras on fishing vessels and physical dockside checks.<sup>200</sup> In his view, this demonstrates that ITQs are not creating a strong enough motivation for fishers to choose voluntarily to conserve.<sup>201</sup> He suggests that fishers do not perceive their ITQs as reasonable guarantees of significant long-term value because they expect that the fish stock could easily be destroyed by some factor other than overfishing, such as climate changes or pollution.<sup>202</sup>

This aspect of Bromley's interpretation is questionable on at least two grounds. First, especially in the light of the management failure of many of the regimes that existed before the introduction of IQs, it appears likely that enforcement has been inadequate in the past.<sup>203</sup> If this were true, then the additional enforcement effort, that accompanied the introduction of IQs, would have been equally necessary if the previous regime had remained in place.<sup>204</sup>

Second, the fact that a certain set of laws requires enforcement does not in itself mean that those laws are failing to set up the right incentives.<sup>205</sup> No one would claim that contract law, for example, fails to encourage desirable behavior merely on the grounds that it is backed up by a large and costly enforcement structure. The fact that contracts need

---

196. *Id.*

197. *Id.*

198. WASH. REV. CODE § 76.09 (1993).

199. Bromley, *supra* note 6 at 282.

200. *Id.* at 283.

201. *Id.*

202. *Id.* at 282.

203. Nickler, *supra* note 25, at 575-576.

204. Dietmar Grimm et al., *Can Catch Shares Reduce the U.S. Federal Deficit?*, 3 J. SUSTAINABLE DEV. 118, 122 (2010).

205. Christopher J. Carr & Harry N. Scheiber, *Dealing with A Resource Crisis: Regulatory Regimes for Managing the World's Marine Fisheries*, 21 STAN. ENVTL. L. J. 45, 58-59 (2002).

enforcement in order for a contract-based legal system to work properly does not mean that contract law creates the wrong incentives. It just means that contracts without adequate enforcement are not really contracts. Similarly, if there is not enough enforcement to ensure that a fisher will not exceed the amount defined by his IQ, then it can be argued that the IQ is not really a quota. Hilborn et al. (2004) suggest that the inability to enforce quotas explains why an IQ scheme in British Columbia's abalone fishery failed, even though several other IQ regimes in the same area succeeded.<sup>206</sup>

Despite the limitations of Bromley's evidence, it can be concluded that private ownership is neither absolutely necessary, nor fully sufficient for socially responsible stewardship. Bromley supplies at least one valid counterexample to each of these claims, and others can undoubtedly be found.<sup>207</sup> The necessity, or sufficiency, of private ownership, however, is probably not the most interesting or useful question to address. Bromley and his opponents might contribute more by accepting that absolute necessity or full sufficiency do not exist in this case, and by arguing instead over which approach is likely to work *better*, and under what conditions. In short: will some form of property rights generally achieve greater sustainability and/or lower management costs *compared to* alternative schemes which do not include property rights?

It is interesting to point out at this stage that public ownership does not necessary exclude private ownership.<sup>208</sup> A notable example is that of local customary rights, which play a role in fisheries in, inter alia, New Zealand, Australia, the United States and Canada.<sup>209</sup> For example, New Zealand reserves a proportion of the total catch for indigenous Maoris, and Alaska has attempted to enable remote communities to use non-profit organizations to acquire halibut quota.<sup>210</sup> As mentioned before, customary rights are considered public rights in that the rights are granted to a fluctuating body of members. This view is consistent with that of Ziff, who points to the overlap between private and common rights on the one hand, and public and common rights on the other. Private property can, after all, be owned by a joint group of people who have been granted common rights.<sup>211</sup> Such common rights often create

---

206. R. Hilborn et al., *Institutions, incentives and the future of fisheries*, 360 PHIL. TRANSACTIONS ROYAL SOC'Y 47, 47-57 (2004).

207. Bromley, *supra* note 6, at 282.

208. ZIFF, *supra* note 7, at 8.

209. Stewart, *supra* note 29, at 116-118.

210. Fisheries of the Exclusive Economic Zone Off Alaska, 69 Red. Reg. 23681 (Apr. 30 2004) (codified at 50 C.F.R. pt. 679).

211. ZIFF, *supra* note 7 at 8.

the perception of public ownership, such as in the case of a highway, which is in fact owned by public authorities, but to which all members of the public have a right.<sup>212</sup>

Bromley's third "deceit" is the view that ITQs must have an infinite life and tradability in order to work.<sup>213</sup> He provides little or no evidence against this claim however. The argument that supports perpetuity is part of the argument that supports the need for property rights. As already noted, Bromley is unable to attack this argument because he does not even describe it. In practice, however, it is significant to note that no jurisdiction has implemented ITQs that are truly perpetual; all regulators have reserved certain rights to reduce, revoke, or buy back quota.<sup>214</sup> Furthermore, all regulators impose at least a few limitations on trading, such as a cap on the total share that any one person or company can hold, or reservations of quota for certain groups.<sup>215</sup> In other words, Bromley's third "deceit" is something of a straw man, as no fishery regulators have actually set up such a regime.

Bromley identifies an important problem, however, when he suggests that perpetuity may not provide enough incentive for fishers to conserve.<sup>216</sup> He argues that there is a high risk that other factors outside anyone's control could destroy future catches even if fishers do conserve.<sup>217</sup> As a result, he believes that the present value of conserved fish is too small to be an incentive for conservation.<sup>218</sup> The present paper already noted that the riskiness of future catches could partly explain why ITQ schemes seem to need significant enforcement effort. Clearly, it would be valuable to learn more about the riskiness of future catches, and to assess whether there are ways of reducing the level of uncertainty.<sup>219</sup>

Bromley's fourth "deceit" is the simple claim that ITQs are property.<sup>220</sup> According to Bromley, this is false. ITQs are "permits and nothing more."<sup>221</sup> In order to support this claim, he quotes American legislation, which explicitly states that ITQs "shall not create, or be

---

212. *Id.*

213. Bromley, *supra* note 6, at 282-283

214. Stewart, *supra* note 29.

215. *Id.*

216. Bromley, *supra* note 6, at 283.

217. *Id.*

218. *Id.*

219. Richard Barichello & Adam Soliman, *ITQs and Fisheries Management: Policy Risk in Canadian Sablefish*, INT'L. AGRIC. TRADE RES. CONSORTIUM (2012), available at <http://EconPapers.repec.org/RePEc:ags:iat12m:142911>.

220. Bromley, *supra* note 6, at 284.

221. *Id.*

construed to create, any right, title, or interest in or to any fish before the fish is harvested by the holder.”<sup>222</sup> As this paper has already shown, however, the question of whether property rights exist cannot be safely answered simply by referring to legislation. Precedents, judicial decisions and constitutional constraints can also create or weaken property rights.<sup>223</sup> The legislation referenced by Bromley is best seen as an *attempt* by the legislator to reduce the risk that future court decisions might create an obligation for the government to pay compensation if it revokes an ITQ.<sup>224</sup> There is no guarantee that such an attempt will succeed.

In his discussion of the fourth “deceit,” Bromley at one point makes the strange claim that ITQs are equivalent to TACs, “so when they tell us that they found 121 fisheries using “catch shares” they should have told us that they found 121 fisheries in which TAC limits had been introduced.”<sup>225</sup> Although he states the opposite later in the same page (“If one wished to test the stewardship properties of catch shares (IFQs), the careful researcher must analyze a large number of TAC-controlled fisheries and then find some that have introduced IFQs.”), his implication that ITQ supporters have treated ITQs as equivalent to TACs is false. Munro et al., for example, focused very strongly on the difference between TACs with ITQs and TACs without ITQs.<sup>226</sup>

Bromley also argues that many fisheries economists incorrectly view ITQs as “property rights.”<sup>227</sup> He quotes numerous articles on fisheries to support this view,<sup>228</sup> but misinterprets much of the literature he quotes. For example, he quotes Leal<sup>229</sup> and Arnason,<sup>230</sup> and then states that both authors, according to Bromley, incorrectly claim that ITQs are private property rights.<sup>231</sup> In fact, Leal does not state that ITQs are full property rights. Instead, he argues that private property rights *should* be granted in fisheries.<sup>232</sup> He even explicitly acknowledges that the American legislation quoted by Bromley fails to create such property rights.<sup>233</sup> Arnason also acknowledges that ITQs are not full property

---

222. *Id.*

223. *Id.*

224. *Id.*

225. *Id.* at 285.

226. Munro et al., *supra* note 50.

227. Bromley, *supra* note 6, at 285.

228. *Id.*

229. Leal, *supra* note 13.

230. Arnason, *supra* note 14.

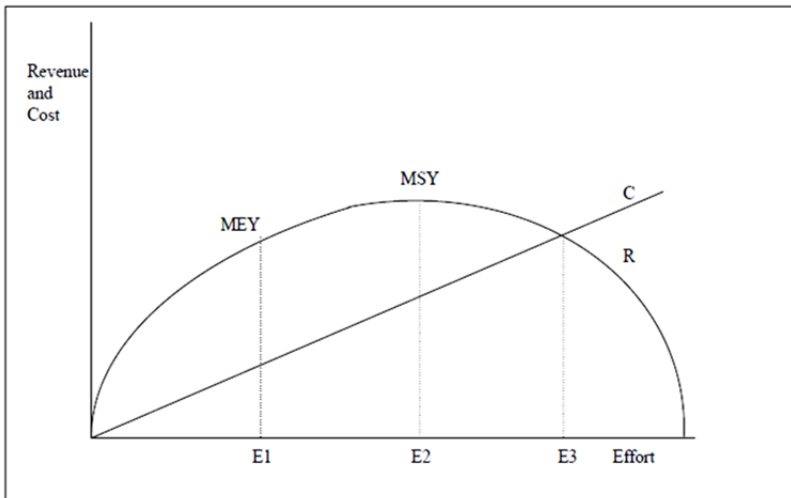
231. Bromley, *supra* note 6, at 283.

232. Leal, *supra* note 13, at 25-26.

233. *Id.*

rights, but makes a case – again – that they *should* be.<sup>234</sup> Therefore, contrary to Bromley’s statement, neither of the authors claim that ITQs are private property rights but merely argue that (to a greater or lesser extent) they ought to be.

Bromley’s final “deceit” is the view that ITQs increase economic efficiency.<sup>235</sup> In an effort to refute this position, he analyzes Figure 1, a fairly standard graph<sup>236</sup> of output (catch) and fishing effort. He attempts to argue that a fishery operating at effort level E1 is not more “efficient” than one operating at E3.<sup>237</sup> This is inconsistent if “efficiency” is defined as the ratio between output and input. Both levels of effort produce the same catch, and, therefore, the same value, but E3 consumes more resources. Therefore, if a fishery operates at E1 instead of E3, all the unused resources could be employed in other productive economic activities. From the viewpoint of maximizing output in the total economy, E1 is more efficient.



234. Arnason, *supra* note 14, at 19. Arnason specifically claims that adequate property rights would be sufficient to solve “the fisheries problem,” which he defines as overcapitalization, inefficiency, and reduced fish stocks.

235. Bromley, *supra* note 6, at 286-288.

236. It appears that neither Bromley, nor the authors of the paper from which Bromley extracts Figure 1, have noticed a peculiar and fundamental error in the graph: the two lines require completely different measurements on their respective Y axes, and so do not belong on the same graph at all. The curved “yield” line must be measured in “quantity of fish”, while the straight “effort” line must be measured in dollars.

237. *Id.*

It appears that Bromley's real complaint is about fairness, not efficiency.<sup>238</sup> In a fishery that operates at E1, the fishers enjoy excess profits, whereas in a fishery that operates at E3, they receive only normal profits. To resolve this unfairness, however, does not necessarily require abandoning efficiency and moving to E3. An appropriate taxation or royalty structure could reduce inequity by transferring some of that excess profit to the public as payment of the resource rent to which they are entitled.<sup>239</sup>

### *C. Arguments Supporting ITQs as an Approach to Sustainability*

#### **1. Leal and Arnason**

Donald Leal argues that government control establishes the wrong incentives and that stronger private property rights should be established for American ITQs.<sup>240</sup> As noted above, ITQs in the United States have fewer characteristics of property rights than in most other jurisdictions.<sup>241</sup> Though Leal is a proponent of ITQs, he argues that a TAC and ITQs controlled by the government result in a less efficient fishery than what could be achieved if ITQs carried full private property rights.<sup>242</sup>

According to Leal, the fact that the government is responsible for setting TACs makes the government the target for fisheries interests groups lobbying for higher TACs.<sup>243</sup> Leal argues that if ITQs gave enough security and certainty to their owners, then the fishers would voluntarily "take a longer view and protect the resource," because they would want to safeguard their property (the fish) for their own future use and benefit.<sup>244</sup> Fundamentally, this is little more than a restatement of the original argument, based on the "tragedy of the commons," which supports creating some type of property rights for fishers.

Arnason argues that stronger ITQ property rights lead to greater economic efficiency.<sup>245</sup> He argues that a properly structured free market that enables externalities (such as the long-term impact of overfishing on

---

238. *Id.*

239. Matthew Lansford & Laura S. Howorth, *Legal Impediments to Limited Entry Fishing Regulation in the Gulf States*, 34 NAT. RESOURCES J. 411, 431 (1994).

240. Leal, *supra* note 13.

241. *Id.*

242. *Id.*

243. *Id.* at 16.

244. *Id.* at 22-24.

245. Arnason, *supra* note 10, at 18-19.

the stock and on other fishers) to be priced correctly will result in greater productivity at less cost than any other system.<sup>246</sup>

However, Arnason recognizes that social opposition currently limits further extension of the property right regime.<sup>247</sup> He points mostly to the fact that if property rights are to be granted, current (common) owners will impliedly be deprived of their existing rights to harvest the resource.<sup>248</sup> Moreover, he points out that social institutions would need to be overhauled before full property rights could be implemented.<sup>249</sup> In the interim, a temporary situation of uncertainty in regards to property rights would exist.<sup>250</sup>

As long as the reward for environmental protection is less than the reward for economic exploitation, it is easy to see how these incentives can result in environmentally damaging results. A scheme based on pure enforcement cannot incentivize proper management of business interests and environmental protection – such a scheme can only punish.<sup>251</sup> The most obvious and straightforward way to reward conservation is simply to give the conserver some kind of ownership of what is conserved.<sup>252</sup> On this basis, we can regard Leal and Arnason's recommendations as efforts to strengthen the incentives by strengthening and expanding the property rights which create those incentives. Unfortunately, both authors fail to clearly set out how a system of full property rights would function. For instance, these authors do not address the key practical questions of how property rights could be enforced when fish are perpetually moving around, and regularly exist as "straddling stocks."<sup>253</sup>

## 2. The Principal-Agent Model

Munro et al. argues that the Principal-Agent model of game theory theoretically supports the view that private property regimes such as ITQs will support sustainability more effectively than systems such as open access or limited access without individual catch shares.<sup>254</sup> In general, a "principal-agent" situation exists whenever a "principal" who

---

246. *Id.*

247. *Id.* at 19.

248. *Id.*

249. *Id.* at 22-23.

250. *Id.* at 24-25.

251. Bromley, *supra* note 5, at 281.

252. *Id.*

253. ROBIN R. CHURCHILL & ALLEN V. LOWE, *THE LAW OF THE SEA* 281 (3d ed. 1999).

254. Munro et al., *supra* note 5, at 4-5.

has certain interests and goals assigns an “agent” to protect those interests and achieve those goals.<sup>255</sup>

In fisheries, the principal is the public (as represented by the government), and the agents are the fishers, fishing companies, and fishers’ unions.<sup>256</sup> The principal defines the incentive scheme (for example, regulations) that will apply to the agents, and this scheme, along with the actions taken by the agents, determines both the returns to the agents and to the principal.<sup>257</sup> We may take it for granted that the principal has a strong interest in conservation,<sup>258</sup> and that the public’s primary goals are to maintain and, if possible, enrich the fish stock.<sup>259</sup>

Aligning the interests of the fishers with those of the public and the government is best accomplished through providing fishers with proper incentives for stewardship and conservation.<sup>260</sup> As evidence that this has happened, Munro et al. cite significant reductions in TAC overages after the introduction of ITQs.<sup>261</sup> Grimm et al. also state that ITQs have reduced overages and that they have led to reduced discards (bycatch), more accurate TACs, and better management options.<sup>262</sup>

“Bromley’s approach—in which government attempt to achieve sustainability by using regulations and enforcement—is weakened by the principle-agent model.”<sup>263</sup> Bromley’s argument clearly assumes that a government regulator will have what might be called “good intentions”; that is, the regulator will genuinely direct its efforts and knowledge

---

255. Under the principal-agent model, the degree to which the principal’s interests and goals are realized depends on the degree to which the principal and agent’s interests are aligned. Game theory looks at the incentives and mechanisms that can be introduced to align these two interests.

256. Munro et al., *supra* note 5, at 5.

257. *Id.*

258. *Id.*

259. *Id.* From the point of view of game theory, the principal wants to create an incentive scheme or enforcement system that causes the interests of the agent to be aligned as well as possible with the interests of the principal. The challenge is therefore to find the right mechanism that will trigger a shift of interest so that the two interests become aligned. If the incentive scheme does not achieve this alignment, the result is an incentive gap between the principal and the agents.

260. Munro et al., *supra* note 5, at 5.

261. *Id.* at 19-20. Adam Soliman, *Impacts of Individual Transferable Quotas in Canadian Sablefish Fisheries: An Economic Analysis* (July 2010) (unpublished M.Sc dissertation, University of British Columbia) (on file with author). The same authors also report evidence of specific efforts to support and promote stewardship; both sablefish and groundfish fishers have made voluntary monetary contributions to support research into stock assessment.

262. Grimm, *supra* note 204, at 130. Some have suggested that the TAC amount is potentially vulnerable to lobbying efforts. To date, however, this has only been shown to be a potential threat rather than a real one and the research conducted in preparing this paper was unable to find hard evidence that this threat had been realized.

263. Bromley, *supra* note 6.



towards socially responsible stewardship.<sup>264</sup> This is what is in the interests of the public, which owns the resource.<sup>265</sup>

The principal-agent model, however, shows us that the government is not actually a principal when it regulates a publically owned resource such as a fish stock.<sup>266</sup> At this point, we cannot avoid asking what mechanisms exist to align the interests of the principal (the public) and the agent (the government), and how effective these mechanisms are.<sup>267</sup> If these mechanisms are weak, then there is little reason to expect the government regulator to work consistently and strongly to achieve the public's goals.<sup>268</sup>

In general, it appears that the mechanisms that should align the regulator's goals and the public's goals are weak and unreliable.<sup>269</sup> Regulators receive no financial benefit if a fish stock is well maintained, and suffer no financial losses if it is depleted.<sup>270</sup><sup>271</sup> As for non-financial motivators, such as unwelcome attention from the news media or possible lawsuits, these do not appear to happen often or quickly enough to strongly influence regulators' behavior.<sup>272</sup> Therefore, we cannot unreservedly accept Bromley's assumption that regulators will reliably and effectively pursue the public's interest.<sup>273</sup> This, in turn, calls into question his conclusion that regulation can be effective without incentives based on property rights.

### 3. Leader-Follower Model

Munro et al. argue that the fishers in a catch share or ITQ scheme may be playing a cooperative game, and that the resource managers are playing a leader-follower game with the fishers.<sup>274</sup> In general, a leader-follower relationship is a strategic game in economics in which the

---

264. *Id.*

265. *Id.*

266. Munro et al., *supra* note 5, at 5. In fact, it is an agent, working on behalf of the public, which is the true principal.

267. *Id.*

268. *Id.*

269. Katrina M. Wyman, *The Property Rights Challenge in Marine Fisheries*, 50 ARIZ. L. REV. 511, 518-520 (2008).

270. *Id.*

271. In theory, the complete disappearance of a stock could cause regulators to lose their jobs, but it is equally likely that a serious decline that falls short of disappearance could be used to justify increased regulation.

272. *Id.*

273. Bromley, *supra* note 6.

274. Gordon Munro et al., *Catch Shares, the Theory of Cooperative Games and the Spirit of Elinor Ostrom*, INT'L INST. FOR FISHERIES ECON. AND TRADE 4 (July 2012), available at <http://tinyurl.com/ob4uecj>.

leader has some advantage that enables it to move (to take an action) first, after which the follower acts.<sup>275</sup> In fisheries, it exists whenever the law gives the resource manager authority over the first move (e.g., granting access to the fishery resource within a given geographical area), and the fishermen cannot make their move (i.e., fishing) until that has happened.<sup>276</sup> It is assumed in this model that the resource managers wish to maximize the profits of the fishers minus the enforcement costs.<sup>277</sup> Also, it is assumed that the fishers will attempt to maximize their profits taking into account the probability of incurring a fine for taking harvests in excess of the TAC.<sup>278</sup>

In this model, the resource manager has two instruments at his/her disposal: (1) the establishment of a TAC; and (2) the control over fishing effort, which is the enforcement of the TAC.<sup>279</sup> Because the TAC is decided upon prior to the fishing season, the enforcement component is the only instrument available to the resource manager upon commencement of the fishing season.<sup>280</sup> Munro and his co-authors have found that the greater the degree of cooperation among fishers, the better it is for the resource manager.<sup>281</sup>

In order for cooperation to be feasible, two pre-conditions must be met: (1) the players must be able to communicate effectively; and (2) the players must be persuaded that a potential cooperative surplus exists in the sense that the sum of the expected payoffs to be enjoyed by the players from cooperation exceeds the sum of the expected payoffs to be enjoyed under competition.<sup>282</sup> If these conditions exist, then cooperation is feasible, but it is not necessarily stable. In order for a cooperative game to be stable as well as feasible, further conditions must exist.<sup>283</sup> First, the solution to the game must be collectively Rational.<sup>284</sup> This means that when each individual actor (or “player”) acts rationally, their actions would result in an improvement to the fishing stock. This means that the most likely outcome from the game, that is when each individual “player” follows their rational self-action, in the case of fisheries; an improvement to the fishing stock. Second, cooperation must be

---

275. *Id.*

276. *Id.*

277. *Id.*

278. *Id.*

279. *Id.*

280. *Id.*

281. *Id.* at 5.

282. *Id.* at 6.

283. *Id.* at 8.

284. *Id.*

individually rational, which means that each and every player must continuously expect that their payoff from the cooperative game will be at least as great as the payoff that he or she would expect to obtain from behaving as if it were a competitive game—in other words, cheating.<sup>285</sup> There have been many instances throughout history that show that the consequences of competitive or non-cooperative management of fishery resources drive fishers toward cooperation with the ultimate consequence being the absence of degradation of the fish stock.<sup>286</sup>

#### 4. Further Empirical Evidence

In 2002, Arnason reviewed and assessed ITQ fisheries in eight countries, addressing the legal and operational nature of each regime, the economic impact, and any evidence of increased resource stewardship.<sup>287</sup> He found statistical and anecdotal evidence that fishers assumed greater stewardship responsibilities in seven of the eight countries, the exception being Namibia.<sup>288</sup> The strongest evidence appears to come from Iceland, where the fishing industry cooperates actively to enforce fishing regulations, and New Zealand, where the fishing industry conducts biological research and some fisheries are nearly self-managed.<sup>289</sup>

In previous research, the present author has shown that the ITQ system that applies to sablefish in British Columbia is reasonably efficient and effective in its current form.<sup>290</sup> This system provides some incentives that encourage fishers to conserve, maintains fair competition and allows reasonable access to fisheries, while avoiding excessive compensation claims and allowing for sufficient government control.<sup>291</sup>

Taken as a whole, the evidence generally supports the view that schemes based on some form of property rights are more likely to achieve socially responsible stewardship with a reasonable level of effort than schemes based purely on government control and enforcement.<sup>292</sup> To a large extent, the creation of ITQs was a response to the observed failure of older forms of regulation.<sup>293</sup> Bromley's claim that governments can effectively maintain sustainability is not well supported; even some of his own evidence conflicts with it.

---

285. *Id.*

286. *Id.*

287. Arnason, *supra* note 13.

288. *Id.*

289. *Id.* at 32-33.

290. Soliman, *supra* note 261, at 13-16.

291. *Id.*

292. Wyman, *supra* note 269, at 517.

293. *Id.*

#### *D. Other Criticisms of ITQs*

Several authors have presented at least two other criticisms of ITQ schemes which are quite separate from the question of whether or not they promote sustainability: the unfairness of initial free allocation<sup>294</sup> and the fact that ITQ regimes can enable “armchair fishing.”<sup>295</sup>

With respect to initial free allocation, Bromley argues that if ITQs are initially allocated to fishers at no charge, it is unfair to the resource owners (the public) who should receive a resource rent.<sup>296</sup> As noted above, the apparent reason for allocating without any charge is legal, not economic: Governments allocate at no charge in order to avoid making ITQs appear to be full property rights, which could lead to court-ordered compensation when an ITQ is revoked.<sup>297</sup> From an economic perspective there is no reason why ITQs must be allocated for free.<sup>298</sup>

Even if this legal risk makes it impossible for governments to charge a price when ITQs are allocated, is not the only way that the public could be compensated. It is entirely possible to charge a royalty for fish caught.<sup>299</sup> Royalties would allow the allocation of a quota to remain free, thus addressing concerns of potential compensation claims.<sup>300</sup> Another possible approach is to increase the charge for licenses (which are separate from the ITQs) to reflect or approach the fair market price that otherwise exists for an ITQ.<sup>301</sup> One consequence to be expected is that the value of the quota would decrease—but not necessarily dissipate—because fishers would need to reallocate part of the money that they now invest in the ITQ to the license.<sup>302</sup> Of course, if the government charges royalties or increases the license cost, it must not charge so much that the fisher cannot obtain reasonable profits; otherwise, the scheme will be ineffective.<sup>303304</sup>

---

294. Macinko & Bromley, *supra* note 15.

295. Pinkerton & Edwards, *supra* note 87.

296. Macinko & Bromley, *supra* note 15.

297. *Id.*

298. *Id.*

299. Suzanne Iudicello et. al., *Putting Conservation into the Fishery Conservation and Management Act: The Public Interest in Magnuson Reauthorization*, 9 TUL. ENVTL. L.J. 339, 340 (1996).

300. *Id.*

301. Lansford & Howorth, *supra* note 239, at 431.

302. *Id.*

303. *Id.*

304. Further questions remain in this regard: should the public have a proportionate interest in the accumulated value of quota already freely allocated in the past? Would the public then be able to sue in restitution? On the other hand, it may not be fair for quota holders to be charged retrospectively for this accumulated value. These questions require further research and are out of this paper’s scope.

Another weakness of ITQ schemes, at least in the view of some observers, is that they enable “armchair fishing.”<sup>305</sup> More properly called “tenant fishing,” “armchair fishing” occurs when ITQ holders do not fish themselves, but lease their quota on an annual basis to active fishers.<sup>306</sup> This situation occurs partly because when quotas are actively traded, they are likely to become concentrated in the hands of those who can afford to pay the most.<sup>307</sup> These people may not be the actual fishers; they might be, for example, professional investors who can obtain capital at much lower interest rates than most fishers can.<sup>308</sup> Some critics consider this unfair on the grounds that only those who actively fish should profit from a fishery, or that this practice concentrates the rents from the fishery into too few hands.<sup>309</sup>

If a regulator wants to limit this practice, it can be done by such means as including a requirement that ITQ holders must offer their quota shares up for sale if they are not participating actively in the fishery,<sup>310</sup> or a tax on profits obtained from ITQ leasing. Whatever the solution, it is certain to restrict the full and free choice that is normally associated with true ownership. This again suggests that it would not be useful to modify ITQs in such a way that they would confer full and unlimited property rights on their holders.

## V. CONCLUSIONS AND RECOMMENDATIONS

ITQ schemes do not create full private property rights, but rather proprietary “interests” that fall short of full ownership.<sup>311</sup> They are neither necessary nor sufficient in themselves for establishing a sustainable fishery.<sup>312</sup> Nevertheless, if carefully designed and managed, they contribute significantly to this goal.<sup>313</sup> Because ITQ schemes create a long-term proprietary interest in the fish stock, they give fishers an economic incentive to keep that stock healthy.<sup>314</sup> Empirically, many ITQ fisheries have observed reduced TAC overages and better participation by fishers in conservation efforts.<sup>315</sup>

---

305. Pinkerton & Edwards, *supra* note 87.

306. *Id.*

307. DANIEL W. BROMLEY & SETH MACINKO, *RETHINKING FISHERIES POLICY IN ALASKA: OPTIONS FOR THE FUTURE* (2007) (Report prepared for the Alaska Department of Fish and Game).

308. Pinkerton & Edwards, *supra* note 87.

309. *Id.*

310. *Id.* at 712.

311. Macinko & Bromley, *supra* note 15.

312. *Id.*

313. *Id.*

314. *Id.*

315. *Id.*

It is likely that the limited non-ownership rights that are currently provided by ITQs are more effective for achieving sustainability than full property rights would be.<sup>316</sup> It is in the interest of the government and the general public (as owner) for the government to retain the power to intervene.<sup>317</sup> For various reasons, situations can arise in which ITQ holders might find exploitation rather than stewardship to be in their best economic interest.<sup>318</sup> If sustainable fishing practices are abandoned and fish stocks are in danger of disappearing, the public interest can only be protected if the government has the power to intervene, and acts on this power.<sup>319</sup> This type of emergency intervention might not be possible if the property rights granted to fishers by ITQs were made too secure and permanent.<sup>320</sup>

Many existing ITQ systems have weaknesses that are not related to sustainability or the absence of it.<sup>321</sup> These weaknesses can be corrected, however. First, most ITQ programs initially allocated the quota shares to fishers at no cost, thus depriving public (as owner of the fish) of any compensation for what amounts to a type of expropriation.<sup>322</sup> This inequity could be corrected by imposing a royalty or a tax on fishers based on their catch, which will effectively flow back to the public. Second, ITQ fisheries often allow a considerable amount of tenant fishing;<sup>323</sup> this could be reduced by such means as applying an active management requirement to ITQ holders.

In summary, properly designed ITQ schemes using measures such as those described here can better align the interests of the government, the public and fishers, thus helping to reach the overall goal of sustainable fisheries.

---

316. Munro et al., *supra* note 5, at 5.

317. *Id.*

318. *Id.*

319. *Id.*

320. FOOD & AGRIC. ORG. OF THE U. N., *supra* note 102. In some jurisdictions, however, strengthening the limited form of property rights which fishers hold under this ITQ scheme would make the scheme more effective. For example, if the U.S. were to implement a registry such as that used in New Zealand, this would make fishers' rights more secure. Greater security would generally increase the value of a fisher's future takings, by reducing the risk that the fisher's right to that future catch might be lost. This would increase the present value of the future income that the fisher can receive by conserving the stock.

321. *Id.*

322. Bromley, *supra* note 6, at 287.

323. Pinkerton & Edwards, *supra* note 87.