Challenges to Effective Third-Party Certification in Environmental Policy

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Abstract

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This dissertation expands club theory to include motivations of club owners as well as club members to better predict outcomes of interest to policy makers. A club is an organization that creates voluntary standards such as methods of production with lower negative externalities. A club owner is an individual or institution that creates rules, collects dues and enforces club member compliance. A club member is the organization or firm that chooses membership in a club and agrees to comply with club rules. Club theory has been proposed as an opportunity for "win-win-win" outcomes for consumers, producers and policy makers. In this scenario consumers have preferences for credence attributes of environmentally sensitive methods of production identified by firm membership in a club, club members receive benefits of price premiums or market share unavailable to firms who are not club members, and policy makers forgo costly command and control tools for low cost market-based tools. The expanded club theory in this dissertation identifies circumstances where incentives are not aligned to create win-win-win outcomes. The first chapter presents an extension to club theory, the second chapter presents qualitative research on the motivations of the U.S. Alaska pollock fishery to join clubs or create clubs and

the third chapter presents quantitative research on the stated preference for third-party certified goods with varying numbers of goods with third-party certification in the same issue-space.

Chapter one expands club theory to include the motivations of club owners to capture benefits unrelated to club member benefits to identify under what circumstances outcomes from the use of club goods will be similar to common pool resources. This chapter addresses the question: ***How can relaxing existing assumptions about motivation of actors in club theory improve the prediction of outcomes from third-party certification?*** Club theory is built upon the premise that benefits to club members are relatively excludable and non-subtractable. Existing club theory predicts the successful use of club goods to harness market forces to achieve policy objectives by aligning incentives between consumers and producers at low cost to government, resulting in a "win-win-win" outcome. In contrast, outcomes for common pool resources may be a "tragedy of the commons" where independent actors maximize personal utility by consuming a good until marginal utility equals marginal cost and reach equilibrium where social utility is sub-optimal. In this chapter I explore the motivations of club owners, those that create clubs and set rules, and club members, those who join clubs and produce products that meet club rules. Specifically, I examine the motivations of club owners to modify club rules to maximize benefits to club owners regardless of impacts on club members. The existing assumptions are that benefits to club owners are aligned with benefits to club members. If the existing assumptions of alignment of incentives between club owners and club members do not hold, then existing club theory may incorrectly predict win-win-win outcomes. An alternate alignment of incentives may produce outcomes less like win-win-win outcomes and more like a tragedy of the commons. This chapter explores a popular variant of club goods: third-party certifications. Third-party certifications are theorized to reduce information and search costs for goods and services produced with unobserved characteristics. These characteristics may include environmental externalities such as sustainable fisheries certified by the Marine Stewardship Council, best practices for emissions of toxic chemicals certified by the International

Standards Organization, labor practices certified as fair by Fair Trade International for goods such as coffee, chocolate, diamonds or tea, and the risk of bond default by debt security ratings organizations such as Moody's, Standard and Poor or Fitch. This chapter uses an example of environmental policy such as the sustainability of a fishery. The contribution of this chapter is an expansion of the club good model to include benefits to club owners unrelated to club members and how the expanded model may be used to predict incentives. The expanded model suggests that club owners may produce club rules that maximize benefits to club owners and may not achieve public policy objectives.

The research question for the second chapter is: ***Will the addition of new certification clubs in a market reduce the incentive for firms to pursue conservation practices?*** In this chapter I argue existing club members understand benefits to club owners derived by changing club rules, such as processes for accepting new members, setting standards and reporting mechanisms, and that club members use this information to move to competing clubs or create competing clubs in the same issue-space. This framing suggests that club members will join alternative clubs, or create new clubs, where net benefits to club members are greater, or create new clubs to capture benefits formerly available only to club owners. From the framing of independent benefits to club owners and club members I develop hypotheses on the motivation and ability of club members to switch clubs. In this research I use a case study of the U.S. Alaska pollock fishery and use qualitative methods to explore agency, motivation, and ability of club members to switch membership between clubs and create new clubs. This research uses a case study of the U.S. Alaska pollock fishery which was certified as sustainable by the Marine Stewardship Council in 2005, then sought a rival certification of sustainability from Responsible Fisheries Management in 2011. This research traces the motivations of the U.S. Alaska pollock fishery through the decision to join one certification for sustainability and then a rival certification for sustainability. I conduct semi-structured interviews (n=15) with members of the U.S. Alaska pollock fishery to establish perceived costs and benefits of joining a club before initial certification, during initial certification, before seeking rival

certification and after obtaining rival certification. This research extends club goods theory by focusing on competition among clubs within a single market and the motivations of club members as a function of club owner benefits predicted in chapter one. The findings suggest that the more certification clubs enter a market the less incentive firms may have to follow conservation practices, which may lead to environmental outcomes similar to an open-access tragedy of the commons.

Chapter three addresses the research question: ***Does an increase in the number of certifications within a single issue-space result in outcomes similar to outcomes of a subtractable good?*** Goods bearing third-party certifications of environmentally responsible production are examples of using club goods to enable consumers to express preferences for environmental standards and help realize public policy objectives of sustainable environmental practices. Clubs may be fourth-party when the standards for membership are set by the government, or third-party when the standards for membership are set by an outside group. Clubs that grant third-party certifications of goods for sustainability characteristics may be a low-cost option to realize policy objectives because certification may align incentives enabling producers and customers to interact with little government expense. In this construction customers express preferences for products produced using environmentally sustainable methods, club member firms capture price premiums or market share for additional profits unavailable to non-certified competitors and third-party clubs establish standards of production that reduce negative environmental impacts. However, if any part of this causal chain fails, then the market-based tool may not produce the desired environmental outcomes. The Marine Stewardship Council (MSC) has emerged as a leading club that grants third-party certification for fisheries practices and is often cited as a successful example of a club good aligning incentives to promote sustainable fisheries. A growing body of literature using survey and market-based data has shown consumer preferences for MSC certified goods or other certified sustainable seafood products. However, since the first certification by MSC in 2000 many alternative clubs have entered the market and offer alternative third-party certification of sustainable fishing

practices. No research to date has tested the perseverance of MSC price premiums or market share in the face of additional alternative certifications for responsible fisheries. This research is the first attempt to test the impact of varying the number of competing certifications of sustainable fishery practices on benefits to MSC certified firms. This research uses an online stated preference survey (n=610) to test the impact of additional certifications on market share and willingness to pay a 5% premium for MSC certified goods. This research finds that additional certified options decrease the market share for MSC certified goods. These survey results may suggest that benefits to firms in voluntary clubs for environmental practices may lose benefits when there is market entry in the same issue-space. The diluting of benefits to firms in existing clubs may diminish one motivation for firms to remain in voluntarily clubs for environmental practices.

The contribution of this dissertation is the expansion of club owner agency within club theory to predict club member behavior and environmental outcomes. The findings of this dissertation suggest that additional entry to the market for clubs may weaken the alignment of incentives between consumer, producer and clubs to predict win-win-win outcomes. If policy makers neglect this fact, then policies intended to create win-win-win outcomes may instead result in lose-lose-lose outcomes where consumers cannot use producer club membership to differentiate between credence attributes, firms producing credence attributes are not rewarded with price premiums or additional market share and public policy outcomes are not achieved.

Chapter 1:

Challenges to Effective Third-Party Certification in Environmental Policy

Abstract

This paper addresses the question: **How can relaxing existing assumptions about motivation of actors in club theory improve the prediction of outcomes from third-party certification?** Club theory is built upon the premise that benefits to club members are relatively excludable and non-subtractable. Existing club theory advocates for the use of club goods to harness market forces to achieve policy objectives by aligning incentives between consumers and producers at low cost to government, resulting in a "win-win-win" outcome. In contrast, outcomes for common pool resources may be a "tragedy of the commons" where independent actors maximize personal utility by consuming a good until marginal utility equals marginal cost and reach equilibrium where social utility is sub-optimal. In this paper I explore the agency of club owners, those that create clubs and set rules, and club members, those who join clubs and produce products that meet club rules. If the existing assumptions of alignment of incentives between club owners and club members does not hold, then existing club theory may incorrectly predict win-win-win outcomes and outcomes may instead resemble a tragedy of the commons. This paper explores a popular variant of club goods: third-party certifications. Third-party certifications are theorized to reduce information and search costs for goods and services produced with unobserved characteristics. These characteristics may include environmental externalities such as sustainable fisheries certified by the Marine Stewardship Council, best practices for emissions of toxic chemicals certified by the International Standards Organization, labor practices certified as fair by Fair Trade International for goods such as coffee, chocolate, diamonds or tea, and the risk of bond default by debt security ratings organizations such as Moody's, Standard and Poor or Fitch. The contribution of this paper is to improve the club theory model to predict incentives, thus suggesting updates to the use of club goods to achieve public policy objectives.

Introduction

This paper addresses the question: **How can relaxing existing assumptions about motivation of actors in club theory improve the prediction of outcomes from third-party certification?** Environmental policy since 1970 may be characterized by three overlapping epochs defined by environmental policy problems, objectives, points of intervention, and environmental policy tools. The first epoch, from the 1970s to the 1990s, corresponds with the rise of environmentalism, the subsequent clean air, clean water, toxics and hazardous waste legislation and the creation of the Environmental Protection Agency (EPA). This epoch may be characterized as the rise of command and control regulation with the point of intervention the interaction between the federal government and firms (Mazmanian and Kraft 2009, 11,

9). The second epoch, from the 1980s to the 2000s, corresponds with a transition from command and control regulation to more efficient and flexible policy tools that incorporate market mechanisms and incentive programs. This second epoch may broadly be described as a search for efficiency-based reform by creating competition between firms. The point of intervention during this epoch is between firms, and the environmental policy tools include individual tradable quotas for industries as diverse as coal and halibut (Schmalensee et al. 1998; Joskow, Schmalensee, and Bailey 1998; Matulich and Clark 2003). The third epoch began in the 1990s. Environmentalists describe this epoch as a period of collaboration among stakeholders in an effort to "embrace an eco-centric" ethic that will result in sustainable outcomes, and the rise of "private politics" of individual and collective action aimed at resolving conflicts without the use of government or law (Mazmanian and Kraft 2009, 25; Baron 2003). The point of policy intervention in this eco-centric ethic is the expression of preferences for goods produced through environmentally sustainable methods by individual consumers (Mazmanian and Kraft 2009, 9). In the third epoch the point of intervention is individual market behavior and the objective is enabling matches between environmental preferences of the consumer, and practices by the producer. Impeding the preference for sustainability are the classical market failures of search costs for green products and services, and information asymmetries. The challenge to leveraging individual preferences as an environmental policy in this epoch is overcoming the market failure of information asymmetry.

One environmental policy tool to reduce information asymmetry is third-party certification of the environmental qualities of a good or service (Gudmundsson and Wessells 2000; Wessells 2002; Prakash and Potoski 2006; Gugerty and Prakash 2010). Third-party certification is theorized to be an environmental policy tool that reduces information asymmetry and allows individual actors, such as small firms or individual consumers, to leverage market forces to improve environmental outcomes. Third-party certification entails the use of a trusted entity to certify that a good or service is produced in an environmentally friendly way that is unobservable to a consumer, or costly for a customer to verify

(Stigler 1961; Lancaster 1966; Nelson 1970; Darby and Karni 1973). In some instances of third-party certification, the consumer expresses preference for certified goods by paying a price premium for the certified good or choosing the certified good over an uncertified substitute. A success may result where the increased demand for the certified good improves the competitiveness or profitability of the producer, while providing an environmental outcome preferred by the customer, and without incurring costly government regulation. The improvement of competitiveness, or profitability, is a function of the difference between the cost of certification, and the price premium paid by the consumer (Gudmundsson and Wessells 2000; Gereffi, Garcia-Johnson, and Sasser 2001; Prakash and Potoski 2006; Brécard et al. 2009). According to this theory, third-party certification may address the market failure of imperfect information by offering a guarantee that unobservable processes are adopted, and gracefully addresses the market failure of negative externalities by inducing improved environmental processes by disparate producers (Mattoo and Singh 1994; Prakash 1999; Potoski and Prakash 2004; Gudmundsson and Wessells 2000). In this way, market forces reward producers that adhere to higher environmental standards, and provide preferred goods to consumers, while incurring little government expense: a win-win-win solution. Note that the win-win-win solution is based on the creditability of the certification to prompt firms to improve environmental outcomes, the cost of certification, the price premium enjoyed by certified goods, and the credulity of the consumer. Table 1 shows an idealized set of outcomes where the first term represents the environmental outcome and the second term represents the firm outcome. For example, a cell with “win-lose” represents a subset of outcomes where the environmental outcome is positive but a net loss to the firm where the cost of certification exceeds the premium from cub membership.

		Firm Outcome	
		Cost of Cert. < Premium	Cost of Cert. > Premium
Environmental Outcome	Positive Environmental Outcome	win-win	win-lose
	No change or negative environmental outcome	lose-win	lose-lose

cells: (environmental outcome, firm outcome)

Table 1 Third-party Certification Outcomes

In this framework firms wish to move from equilibria in the right-hand column (win-lose or lose-lose) to either of the equilibria in the left-hand column (win-win or lose-win). In either case the firm would move from a "lose" context to one where they "win." Actors concerned with environmental outcomes desire equilibria to move from the bottom row to the top row where the environmental outcome is positive, thus a "win," regardless of the outcome for the firm. If the outcome ends in the top left, then both parties win, and government wins because interested parties are regulating one another at low cost to the government. This outcome matrix summarizes the appeal of third-party certifications, but it does not include mechanisms for actors to move outcomes between equilibria.

Existing theory defines third-party certification as an environmental policy tool for goods that are excludable and non-subtractable (called non-rivalrous in some literature) (Samuelson 1954; Ostrom 1990). Certifications are excludable because firms that have not conformed to the certification standards and are not members of the club, may not claim certification. Membership in the club is rewarded by club benefits, in this case price premiums paid by consumers, or preference of this product over competitors at the same price. Secondly, club goods are non-subtractable when membership of one member in the club does not diminish the benefits of other club members. Goods that are both excludable and non-subtractable are called "club goods" and theory predicting the market and environmental activity of these goods is called "club theory." The motivations of actors in third-party certifications have been modeled using club good theory, where individuals choose to enter a club (or a

group) that offers third-party certification, incur the costs of compliance with club standards, and enjoy benefits of membership (Gudmundsson and Wessells 2000; Prakash and Potoski 2006; Gugerty and Prakash 2010). Motivations of the actors have also been modeled as behavior within groups, where members seek to free ride on group benefits, and members face collective action challenges to producing group goods. Each model makes simplifying assumptions about the motivation and agency of actors in the models.

This paper addresses the question: **How can relaxing existing assumptions about motivation of actors in club theory improve the prediction of outcomes from third-party certification?** In this paper I show that relaxing assumptions about the motivations and agency of actors in club or group theory may predict outcomes similar to common pool resources. I then identify how common pool resource frameworks can be used to predict outcomes that are not win-win-win, and thus fail to achieve desired environmental outcomes. My findings show how third-party certification can lead to perverse outcomes not anticipated by existing theory in cases where there is open entry into the certification market and information asymmetry on the environmental standards of competing third-party certifications. This finding contrasts with existing theory and policy recommendations and presents an alternative prediction of outcomes that are known to exist in practice and are directly contrary to existing theoretical literature. Example third-party certifications include environmental externalities such as sustainable fisheries certified by the Marine Stewardship Council, best practices for emissions of toxic chemicals certified by the International Standards Organization, labor practices certified as fair by Fair Trade International for goods such as coffee, chocolate, diamonds or tea, and the risk of bond default by debt security ratings organizations such as Moody's, Standard and Poor or Fitch.

Historical Review

Environmental policy tools have changed through three epochs over the past 40 years. The three epochs range from top-down command and control policies by the federal government, to collaborative

tools at local levels, and finally to purposively motivated individual actors using market mechanisms to achieve environmental outcomes (Mazmanian and Kraft 2009, 319–20; Mattoo and Singh 1994; Wessells 2002). Changes in policy tools reflect changes in public sentiment, government budget constraints, and the development of alternative policy solutions to government and market failures (Prakash and Potoski 2006). Policy tools are selected as a function of the type of good, and the policy objective. In this section I contextualize environmental policy tools in each epoch and summarize the theory of goods that suggests matches between environmental policy tools and types of goods.

Epoch	Years	Intervention	Point of intervention	Iconic Example
Epoch 1	1970-1990	Command and Control	Government to Firm	Ban of DDT
Epoch 2	1980-2000	Individual Tradable Quotas	Firm to Firm	SO2 Tradable Credits
Epoch 3	1990-Today	Third-party Certifications	Individual/Consumer	Organic Labeling

Table 2 Environmental Policy Epochs and Examples

Environmental policy was dominated by command and control regulation during the first epoch of environmental policy in the 1970s (Mazmanian and Kraft 2009). Command and control regulation is form of Pigovian tax to correct an inefficient market by setting a tax rate at the cost of the negative externality (Pigou 1920). Environmental disasters from the late 1940s to 1970s revealed the impacts of pollution on human and environmental quality of life and inspired command and control regulatory responses. Focusing events, including the death of 20 people by smelter fumes in the "Donora Death Fog" in Pennsylvania 1948 (Prakash and Potoski 2006), Rachel Carson's 1962 exposé on the impact of DDT, *Silent Spring* (Carson 1962), and the Cuyahoga river fire of 1969, led to federal regulation of environmental pollutants (Stradling and Stradling 2008).

In 1970 President Nixon signed the National Environmental Policy Act (NEPA), which contained a procedural requirement to document potential environmental impacts, and established the Environmental Protection Agency (EPA) with the mission "to protect human health and safeguard the natural environment"(EPA 2012). The regulatory actions that followed were predominantly command

and control, including revision of the Clean Air Act of 1970 to include command and control regulations, and the Clean Water Act of 1972. These command and control actions outlawed the emission of harmful externalities, limited discharge of pollutants by entity and imposed fines upon firms found to have broken regulations. The command and control measures, characteristic of the first epoch of environmental policy, reduced pollution, improved the environment, and diminished impacts on many, including endangered, species (Abbitt and Scott 2001; Cole and Grossman 1999). Environmental success of command and control intervention has not been universal. Command and control methods are better suited for "end of the pipe" pollution, may incur costly monitoring, establish adversarial relationships between government and industry, and are remedial not preventative (Mazmanian and Kraft 2009; Prakash and Potoski 2006). Furthermore, this regulatory method has not proven successful in all contexts and has raised questions of efficiency of monitoring and transaction costs for enforcing regulation.

In the second environmental policy epoch alternative policy tools were developed, including methods that incorporate market forces (Mazmanian and Kraft 2009, 8). This second epoch may be described as a response to the failure of some command and control methods (Brown and Layton 2001), a search for efficiency-based reform at the firm level (Prakash and Potoski 2006), and corresponds with the use of public policy tools that leverage market forces (Ward and Phillips 2009). Individual tradable quotas (ITQs), both for consumables, and for more general atmospheric qualities, characterize the effort to leverage the market to penalize inefficient actors and reward efficient ones. One of the most well cited examples of the market approach to environmental policy of this epoch is Title IV of the 1990 Clean Air Act, which revised existing standards and included the "landmark experiment in environmental policy" of the "first-scale, long-term environmental program to rely on tradable emissions permits" (Schmalensee et al. 1998, 53). The novel legislation is an example of "cap" and "trade" where the emission of an environmental bad is first limited, or capped, then the rights to emit are issued with the

explicit understanding that they may be traded between emitters. Allowing the trade of emission rights creates a private good that may be bought and sold, and an economic incentive to lower emission.

The 1990 Clean Air Act capped utility sulfur dioxide (SO2) emissions over two periods, Phase I from 1995 to 1999, and Phase II from 2000 and beyond. Firms that were affected by the cap on emissions were also issued allowances that entailed the right to emit future SO2 within the cap, and the EPA auctioned additional allowances. Ownership of an allowance entitles the owner to emit one ton of SO2 in either the present, or if they choose, the allowance may be banked for use in a future year. Capping and trading SO2 emissions increases the costs of production to relatively inefficient producers, who emit more SO2, and decreases costs for relatively efficient producers that produce less and are therefore less environmentally harmful. Thus the market is leveraged to reduce the emission of an environmental bad by creating policy that transforms open access to limited paid access (Schmalensee et al. 1998; Joskow, Schmalensee, and Bailey 1998). During the second epoch individual tradable quotas were issued for a multitude of goods, including carbon dioxide, and for rights to extract, such as in fisheries like Pacific halibut and sablefish. These actions were accompanied by an appeal to environmental policymakers to broadly shift from command and control to tradable quotas policy tools (Joskow, Schmalensee, and Bailey 1998; Matulich and Clark 2003; Stavins 1998; Socolow 1999).

The third epoch began in the 1990s. This epoch is described as a search for “sustainability” manifest in an effort to “embrace an eco-centric” ethic that will result in sustainable outcomes (Mazmanian and Kraft 2009, 25). Within this framework the ethic for sustainability is revealed by consumers’ willingness to pay price premiums for goods that are produced in a manner judged to be environmentally sustainable. Achieving the public policy objective uses the twin levers of rewarding producers with price premiums when they adhere to the private ethic, and the threat of boycott for failures (Baron 2003). Examples of this ethic include willingness to pay for goods and services that are deemed “sustainable” such as organic certified foods, carbon dioxide (CO2) offsets, shade grown coffee, recycled paper, and

certified sustainable fisheries (Johnston et al. 2001; Wessells, Johnston, and Donath 1999; Roheim, Asche, and Santos 2011; Xu et al. 2012; Tebbe and von Blanckenburg 2018). One of the challenges of leveraging the preferences of individual consumers is the ability to differentiate between sustainable and un-sustainable goods or services, or reliance upon a trusted third party to signal the difference between sustainable or un-sustainable goods or services (Gereffi, Garcia-Johnson, and Sasser 2001).

In each of these epochs the environmental policy change has altered the nature of the environmental good. During the first epoch public policy tool of command and control banned practices and imposed fees on negative externalities. In this way the externality moved from being outside the market to a good (or a "bad") to within the market. This is sometimes called internalizing an externality. In the second epoch, the epoch of individual tradable quotas, goods were changed from open access to limited access. In the framework of theory of goods, this is a change from being non-excludable, to being excludable. In the third epoch, the sustainability ethic created a market for goods that have unobservable characteristics, thus creating a market for certification of the characteristics of that good.

Each of these environmental policy approaches alters the salient characteristics of the goods with the policy objective of enabling prediction of outcomes and shaping of incentives to match desirable outcomes. These changes to characteristics can be analyzed using existing theory of consumers' preferences for qualities of goods (Blomquist, Bartolino, and Waldo 2015). Impeding the ability of consumers to express preference for sustainability are the classical market failures of search costs, and information asymmetries. The challenge for the third epoch is overcoming the market failure of search costs and information asymmetry (Mazmanian and Kraft 2009).

Information Economics

Information on the characteristics of goods is the crux of leveraging consumers' ethic for sustainability to motivate changes by producers. The study of information about a good may be traced back to early

work on “search costs” (Stigler 1961). Stigler identifies the search cost as the expense in time and energy needed to assert the market price for a good; consumers may search for a can of tuna fish sold at the lowest price (Stigler 1961). In Stigler’s model the rational actor continues to incur search costs until the marginal cost of searching is equal to the marginal benefit of additional information. Stigler showed that greater search costs will be incurred for higher value goods, and for non-durable goods that are repeatedly purchased; conversely, the reputational benefits of a store economize search costs. The utility of Stigler’s work is the creation of a formal model for predicting search costs, and implicitly acknowledging the market for signals that reduce search costs, such as store quality, but explicitly does not control for product quality.

Following the early work on search costs, theorists expanded the models to include qualities of a good beyond price (Nelson 1970, 1974; Darby and Karni 1973). This work showed that goods may be categorized as search goods and experience goods. The difference between the goods is how the quality of the good is assessed. Search goods may be identified through examinations of external qualities such as price, color and size. Experience goods may be identified through taste and durability. Additional work further differentiated the attributes of goods to include characteristics sought by consumers that may not even be identified through experience. These “credence goods” have characteristics unobservable to consumers, but for which they may be willing to incur search costs, or pay a price premium (Darby and Karni 1973). Thus, consumers may incur additional search costs to locate a can of tuna with the credence characteristic of having been caught without harming sea turtles or dolphins. In sum the existing theories on search costs predict a market for characteristics of goods that are unobservable to consumers.

Later work characterized goods as sets of attributes and theorized that consumers demand sets of attributes, not goods (Lancaster 1966). More recent work has attempted to categorize attributes for goods such as food (Hooker and Caswell 1996). At the logical extreme is the market for an undefined

good with very few attributes known to the buyer before making a purchase. Such a market not only is possible, it is a growth industry in the United States. Consumers of Community Supported Agriculture (CSA) demonstrate an empirical willingness to pay for unspecified groceries that have the attribute of being locally grown and organic. Consumers with this set of preferences register and pay in advance, and the CSA provider supplies goods grown to meet the determined attributes. Consumers may not know what good will be provided from week to week, but they know that the goods will be locally grown and organic.

Use in Policy

The use of environmental policy tools such as third-party certifications may be matched with the characteristics of the good to be regulated. Goods are broadly grouped by characteristic, most commonly by excludability and subtractability, (Samuelson 1954; Ostrom 1990; Prakash and Potoski 2000). Excludability is the ability to prevent others from consuming a good or service. The classical example of non-excludability is a lighthouse; all ship captains, regardless if they have contributed to the construction or maintenance costs of a lighthouse, may use a lighthouse beacon as an aid to navigation. A lighthouse is unable to exclude some individuals from benefit as a function of their having contributed to construction or maintenance. A good is subtractable if consumption by one individual precludes consumption by another; if one person consumes an apple another may not. The set of goods defined by excludability and subtractability are private, common pool, club and public goods.

	Excludable	**Non-excludable**
Subtractable	**Private Goods** Food, clothing, housing	**Common Pool Resources** Fish stocks, grazing lands, timber
Non-subtractable	**Club Goods** Private parks, cinemas, certifications	**Public Goods** Clean air, national defense, lighthouse

Table 3: Typology of Goods

One utility in categorizing types of goods is in the ability to predict market and government failures associated with the type of good. Open access to goods can lead to market failures of inefficient allocation of resources and overproduction of negative externalities resulting in sub-optimal public outcomes (Malthus 1798; Pigau 1920; Hardin 1968). These market failures may be addressed through governmental and non-governmental interventions, with policy interventions tailored to the type of good. For example, the creation of tradable SO2 emission credits transformed SO2 emission from a public good into a subtractable and excludable good, a private good. The creation of Marine Stewardship Council (MSC) certified fisheries made the products of the certified fishery an excludable good. Fisheries that did not have certification could not use the MSC designation and were excluded from any associated price premium or market share. MSC is a club that allows club member firms to produce MSC certified fish. More generally, environmental policy actions resulted in privatization of goods if they can be made excludable and subtractable, and third-party certification for goods that result in benefits to club members that are excludable and non-subtractable (Coase 1959; Ostrom 1990; Koontz et al. 2004; Buchanan 1965; Cornes and Sandler 1996).

Of these policy interventions, this work focuses on certifications of goods. The certification process has two components: a set of rules, principles, or guidelines, and a reporting or monitoring mechanism (Gereffi, Garcia-Johnson, and Sasser 2001, 57). Institutions with these two characteristics may be subdivided into four categories according to who produces the guidelines: first, second, third, and fourth-party certification. First-party is when a firm develops its own rules, second-party is when an industry or trade association develops the rules, third-party is when an external group develops rules, and fourth-party is when government or multilateral agencies create the rules (Gereffi, Garcia-Johnson, and Sasser 2001, 57–58). Third-party certification is theorized to be a market solution for the failure of imperfect information and negative externalities. The system works in the following way: a trusted third party certifies that the good or service is produced in a way that is unobservable to the consumer, or has

characteristics that are costly to verify, and the consumer expresses preference by choosing the certified good over an uncertified alternative. A third-party certification offers additional information to the consumer about mitigation of externalities not observable from the good or service itself. In this way certification overcomes the market failure of imperfect information.

Third-party certification may predict environmental outcomes if certification promotes environmentally friendly behavior by member firms. In cases where consumers have preferences for goods that are produced in an environmentally sustainable way a third-party certification serves as a signal for unobservable characteristics. Today hundreds of third-party certifications exist to signal unobservable environmental practices of producers. Examples include organic agriculture, with total sales of $1.7B from 2.5M acres of farmland in 2007 (US Dept. of Agriculture 2009, 52), the Marine Stewardship Council (MSC) with 10 million metric tons, roughly 11% of all wild fisheries, of certified fish landed in 2011 (MSC 2013), and Fairtrade International, a wage guarantee for coffee farmers "representing 1.2 million farmers and workers" with sales of $4.5B in global sales in 2008 (Fairtrade International 2012). Consumers who believe that organic production is superior to alternatives may choose to consume organic produce and may express their preference through willingness to pay a price premium for third-party certification that a product was produced organically. If organic production methods are environmentally superior to conventional methods, then consumer preference for organic produce yields positive environmental outcomes.

Arguments favoring third-party certification over command and control cite cost, and limited adaptability of command and control approaches, while extolling the creation of cooperative as opposed to adversarial relationships in command and control regulation (Potoski and Prakash 2004). Theorists identify various rational for firms to prefer voluntary third-party certification, including corporate social performance (Prakash 2001) and brand management (Potoski and Prakash 2005). However, (almost) all of the literature acknowledges that producers of third-party certified goods

command a price premium relative to firms that are not certified, which allows for profit motives (Mattoo and Singh 1994; Gudmundsson and Wessells 2000; Holland and Wessells 1998; Wessells, Johnston, and Donath 1999; Roheim, Asche, and Santos 2011; Xu et al. 2012; Blomquist, Bartolino, and Waldo 2015; Fonner and Sylvia 2015). Willingness to pay premiums, either by individuals joining clubs, or by consumers buying goods certified as produced by members of clubs, fits within rational utility maximization models when explained by changes in information on search, experience and credence attributes (Wessells 2002). These motivations are more formally expressed in existing theoretical works on club and group goods.

Theories of Clubs and Groups

At least two streams of theoretical literature establish frameworks for the use, evaluation and prediction of outcomes of third-party certifications. The economic literature on club good models the motivations of actors choosing to enter a "club", and the institutional literature models the collective and individual choices of entering a "group." I give a short summary of each, including identifying the models, assumptions and bounds on actors.

An Economist Perspective: Club Theory

Club theory is an expansion of traditional models of utility as a function of consumption of goods and services. The simplest model of utility is written as

(1) $U^i = (X_1^i, X_2^i, \ldots, X_n^i)$,

where the utility, *U*, for each individual, *i*, is a function of the amount of a private good, *X*, available to them during a specific time period (Samuelson 1954, 1955). To allow for utility from public goods Samuelson added a second type of goods, public goods,

(2) $U^i = \left(X_1^i, X_2^i, \ldots, X_n^i;\ X_{n+1}^i, X_{n+2}^i, \ldots, X_{n+m}^i\right)$,

where individual *i* may also get utility from public goods (Samuelson 1954, 387). Thus, there are two sets of goods, public and private, where the sum of all private goods for individuals *i* = 1, 2, . . . *s* is

$$X_j = \sum_{i=1}^{s} X_j^i.$$

In this model the private goods are subtractable, while the public goods are non-subtractable, meaning that the consumption of any public good by one individual does not diminish the public good for another. Samuelson puts it succinctly,

$$X_{n+j} = X_{n+j}^i.$$

In his work on club goods Buchanan broadens traditional typology of goods to include a theory of clubs, or "consumption ownership-membership arrangements" to establish a category of goods beyond Samuelson's purely private and purely public goods (Buchanan 1965, 1). Buchanan's club goods are those where more than one individual may have ownership, incur costs, and derive utility from a good. Utility is modeled as a function of "the number of other persons with whom he must share its benefits" and, in some cases requires the "flexible property arrangements and for introducing excluding devices" (Buchanan 1965, 3, 14). Costs are a function of consumption of public, private and club goods, where the cost of a club good is a function of the number of members. Thus, utility is a function of the number of individuals in the club, and the costs of membership.

More formally, the utility for an individual from club goods may be modeled as

(3) $U^i = U^i\left[\left(X_1^i, N_1^i\right), \left(X_2^i, N_2^i\right), \ldots \left(X_{n+m}^i, N_{n+m}^i\right)\right]$

where utility is a function of *N*, the number of individuals in the group. To show the importance of these club goods relative to other goods, Buchanan contrasts goods, X_j, with production or money, X_r. Using the convention of lower case as partial derivatives, he then shows u_j^i/u_r^i is the marginal rate of substitution in consumption between public, private and club goods, X_j, and money, X_r. This marginal

rate of substitution is the rate at which individuals will substitute money for membership in a club, for example, the price they are willing to pay to be in a club. As the size of the club, *N*, is a variable in the utility function, the partial derivative u_{Nj}^{i}/u_{r}^{i} is the marginal rate of substitution in terms of consumption between the number of members in the club, and money, i.e. the change in willingness to pay for an additional member joining a club where you are a member.

Cost also is a function of the membership of the club, as sharing costs with more individuals may raise or lower the cost to an individual. Buchanan individual's cost function, *F*, is a function of the size of the club,

(4) $F = F^{i}\left[\left(X_{1}^{i}, N_{1}^{i}\right), \left(X_{2}^{i}, N_{2}^{i}\right), \ldots \left(X_{n+m}^{i}, N_{n+m}^{i}\right)\right].$

From the partial derivatives of the utility and cost functions Buchanan shows that the marginal conditions for Pareto optimality with respect to each good must be when

(5) $u_{j}^{i}/u_{r}^{i} = f_{j}^{i}/f_{r}^{i}.$

This shows that in an optimal scenario the marginal rate of substitution between goods, X_j, and money, X_r, must be equal to the marginal rate of substitution between production of each. Next, we add a variable for the number of members, *N*, in the clubs

(6) $u_{Nj}^{i}/u_{r}^{i} = f_{Nj}^{i}/f_{r}^{i}.$

This shows that a member of a club is at equilibrium when the marginal benefit from adding an additional member, which may be negative, is equal to marginal cost, which may also be negative (Buchanan 1965). More simply stated, members of a club will add additional members to the club to diminish individual dues, until the change in dues is offset by a change in membership privileges.

This formal treatment allows the derivation of two sets of marginal conditions for optimal club membership. First, we combine (5) and (6) to establish the marginal condition for optimal utility and cost of a club good

(7) $u_j^i/f_j^i = u_r^i/f_r^i = u_{Nj}^i/f_{Nr}^i$.

Buchanan shows that when (7) is met an individual will have Pareto optimal club benefits, U_j, shared optimally over an optimal number of members, *N*. This form allows us to show two conditions, where the optimal number of club members is too many, and when it is too few:

(8) $u_j^i/f_j^i = u_r^i/f_r^i > u_{Nj}^i/f_{Nr}^i$ when N = x
(9) $u_j^i/f_j^i = u_r^i/f_r^i < u_{Nj}^i/f_{Nr}^i$ when N = y

Equations (8) and (9) show the conditions where the optimal number of club members is too few, when N = x, and when the number of club members is too many, when N = y. Insofar as membership level is variable, clubs may increase or decrease the membership pool to achieve optimal allocation of costs and benefits.

The contribution of the model is the establishment of a type of good that has multiple voluntary owners, who enjoy utility for membership in the club, but who must exclude non-members from free-riding. The exclusion of the non-members may entail definition of property rights enjoyed by club members and not by non-members. The limits to this model include assumptions limiting membership to individuals, unspecified club good allocation between members, and what unspecified exogenous variables determine the number of participants in a club. Since Buchanan's work some of the assumptions about club goods have been relaxed. Examples of ways to broaden the model include optimal sharing among clubs, setting optimal exclusion costs, multi-product clubs, crowding, and asymmetric information (Sandler and Tschirhart 1997).

Club Goods in Environmental Policy

The application of club good theory to environmental policy is straightforward. Environmental policy makers wish to find policy tools that do not incur high oversight costs but align incentives in such a way to produce outcomes consistent with environmental policy objectives. Clubs may be used to overcome information asymmetries about production methods, and to signal member compliance with club

environmental standards. Members of the club may use their membership to signal to consumer that their products conform to the standard. To the extent that consumers have preferences for goods produced in an environmentally friendly way that aligns with the club standards, consumers will be willing to pay price premiums for club member goods or will choose them over non-member substitutes. This is described as a "win-win-win" scenario where higher environmental standards are achieved, governmental monitoring and enforcement costs are low, and environmentally friendly producers are rewarded by the market.

The club good framing has utility for several reasons. First, the formal theoretical structure allows for clear modeling of endogenous variables, showing how club member preferences for private, public and club goods predict membership in a club. Secondly, it implicitly shows how the club may be restructured to change behavior by potential club members, for example to establish greater or lesser benefits to increase or decrease membership and raise or lower club costs to increase or decrease membership. Thirdly, it may be used to model when an individual may face a scenario where they would wish to be a member of a club, but not that club. In such a scenario individuals may wish to join a club that provides club goods, but for which the costs are differently distributed. The implication is that individual actors recognize the utility of a club good and can shop around until they find a club where the benefits exceed the costs.

There are substantial limitations to model as well. First, this model does not address the creation of clubs, or the agency of the entrepreneur who created the club. Second, the non-members staff of the club has no agency. Thus, the preferences of the club owner, and club staff, and the impact of these preferences on the club costs and benefits to members, are not included in the model. Third, when condition (9) holds (i.e. the marginal benefits of being in the group are less than the costs at membership level N) but the individual had the ability to create their own group, with membership of less than N, then members of a club may maximize their utility by leaving one club and forming another.

This presents an additional challenge in the field of environmental policy tools, which I explore in the section on expanding the club good theory below.

An Institutional Perspective: Group Theory

A parallel stream of literature analyzes the motivations of individuals to join groups to get group benefits from an institutional perspective. Olson's work *The Logic of Collective Action* moved group theory from an "instinct" or inherent tendency of people to "herding together and fighting with other herds" to a theory that ascribed group membership as a rational action for individuals or institutions to optimize across economic and social benefits and costs (Olson 1965, 17, 65). Olson creates the original theory for analyzing behavior of individuals to form groups based upon characteristics of group, size of group and type of good provided by the group.

The three types of groups are privileged, latent, and intermediate; group size may be large, small or federalized; goods may be exclusive or inclusive. In privileged groups some, if not all, members will reap greater group benefit than the cost of providing the group for the entire group. These members have an incentive to provide all of the collective good, even if they must pay the full cost of provision (Olson 1965, 49–50). In this case the benefits may or may not be a function of group size, but at any group size the benefits of membership outweigh the costs, even when including an unbounded group size in the costs function. Using the model from above, this means that for any number of members, the utility of membership outweighs the costs, so (8) holds for all positive N.

In an intermediate group no single actor has a share of benefits greater than the costs of provision, and the group has few enough members that free riding will be noticed. This is perhaps the most challenging case because the individuals will not bear the costs to receive the collective good without external incentives imposed upon members to inspire provision. In this case, it is possible that the individuals could receive greater benefits than costs through their group membership but face a collective action challenge of organizing the individuals to form a group.

The third group type, the latent group, is defined as when no other member will be significantly affected by the failure of one member to provide the collective good. In this case, no group member has any reason to act to ensure that every member complies with club rules (p. 50). This implies that the marginal cost of membership is unaffected by the number of individuals in the group. Adapting (4) from above to remove the group's size from the cost function, we get a cost function without group size (10), while the utility function (11) remains the same

(10) $F = F^i\left[X_1^i, X_2^i, \ldots X_n^i\right]$
(11) $U^i = U^i\left[\left(X_1^i, N_1^i\right), \left(X_2^i, N_2^i\right), \ldots \left(X_{n+m}^i, N_{n+m}^i\right)\right]$

In this case, the latent groups have no incentive to contribute anything to the group in order for the group to obtain the collective good.

Olson's typology of groups expands the framing of club goods from simply a new type of good, to allowing prediction of club formation from heterogeneous populations by two characteristics: type of group, and type of good. Olson shows the partial derivative of benefits with respect to group size (does your benefit go up or down with the addition of another group member?), and second, the partial derivative of cost with respect to group size (does your cost go up or down with the addition of another group member?) may predict membership, or preferences for changes in number of club members.

Secondly, Olson's theory predicts differences in costs and benefits to group members by group size and allows for benefits and costs to be economic and social. Group size is categorized as large, small or federalized. In the case of large groups, the individual members' marginal costs and benefits are insufficient to affect the provision or the price of the collective good; a change in the behavior of one actor in a thousand will have no perceived impact on the costs or benefits of the other members. For this reason decisions on consumption of collective goods or support of the group are not predicted by social costs (Olson 1965). In smaller groups, social and economic impacts may be made by members, and observed by other members. In these cases, social and economic impacts may predict the behavior

of individual members. In the case of federalized groups, such as a large latent group divided into small groups, members may be influenced by social pressures within the smaller groups to incur costs to change provision or benefits from a common good.

Finally, Olson identifies the difference between exclusive and inclusive collective goods that are produced by group members and sold to the public. Exclusive goods are bounded in quantity demanded, so additional supply decreases the price commanded by any one producer. Thus, in groups where the members produce exclusive goods, the motivation of group is to limit the membership to the group to prevent decreases in prices. Inclusive goods are characterized by expansion of supply, and benefit, with greater membership in the group producing the good. Therefore, the members of a group producing inclusive goods are motivated to increase membership to increase the benefits of their membership.

Olson's group theory predicts an individual's choice to join groups and allows for more nuanced predictions of behavior than the model of the club good. Olson's framework allows for prediction of joining groups by the type of group, social and economic motivations, group size, and inclusive or exclusive collective goods. These additions build upon Buchanan's typology of goods by identifying types of contexts in which members can be motivated to create groups and identifying the types of goods that are likely to predict the formation of a group. The limitations to the Olsonian model of groups are similar to Buchanan's model. This framework does not allow agency for the group entrepreneur, nor model its utility as a predictor of group membership rules. This model identifies contextual conditions as a function of the utility of members but says little about regulatory or political conditions that will impact the formation of groups. Like Buchanan, the role of the entrepreneur in entering and exiting the market for groups or redefining the allocation of costs and benefits among members to maximize utility, is neglected.

Subsequent Developments in Group Theory of Club Goods

The most germane literature to this dissertation on predictors of the success or failure of clubs is scholarship on voluntary membership in environmental clubs (Prakash and Potoski 2006). The environmental clubs characterized in this theory operate by diminishing information asymmetries to allow market forces to reveal preferences for firm behavior. Just as sunshine may be a disinfectant, the practice of removing information asymmetries to achieve policy goals is sometimes referred to as the "sunshine" policy (Matlack et al. 2011; Brandeis 1914). Justice Brandeis' comment on the effect of transparency on banking practices is cited as a motivation for certification:

> Publicity is justly commended as a remedy for social and industrial diseases. Sunlight is said to be the best of disinfectants; electric light the most efficient policeman. (Brandeis 1914, 92)

Environmental clubs operate by establishing a set of environmental practices that club members must adopt to remain in the club. Membership in the club confers the right to advertise membership via a "certification" that the member has adhered to the mandated practices. The theoretical assumption motivating this type of club is that consumers will express their preferences for certified goods by either choosing them over substitutes or paying a premium for these goods over competitors. By leveraging the market preference for certified goods, the club created public value by improving environmental practices while rewarding club members, all without incurring high costs of government regulation.

Prakash and Potoski address two challenges to the effective use of club goods to create public value: inducing membership and ensuring that members comply with rules or pay costs associated with membership. The challenge of getting members to join a club is presented in the context of collective action problems from Olson's work on groups. This "Olsonian Dilemma" is the challenge of motivating potential members that fall within Olson's "intermediate" population to overcome the collective action problem and join a group. The authors identify two characteristics that predict overcoming the collective action problem: "reputational benefits" members receive from stakeholders, and the policy and

"regulatory context" in which the member operates (Prakash and Potoski 2006, 78–79). These benefits are defined by club standards, which "specify the systems and programs firms need to put in place to join a club and retain its membership," and how well the club fits into the policy context. The second challenge is that of shirking. Shirking is defined as a club member failing to comply with club rules but still enjoying club benefits. The authors identify two characteristics that predict the mitigation of shirking; monitoring and enforcement. These rules, "specify monitoring and enforcement mechanisms established by program sponsors to ensure that members adhere to club rules" (Prakash and Potoski 2006, 31).

Prakash and Potoski's major contribution in this vein is the establishment of a typology of clubs. Clubs may form in climates where they fit well within the policy and regulatory contexts. If the club fits well within the climate, then reputational benefits are more likely, and the firm is more likely to join a club. Within a club the behavior of the firms may be characterized by the independent variables of club standards and enforcement rules. Standards may be either stringent or lenient, and enforcement rules either credible or non-credible. This creates a typology of four clubs, shown below in Table 3. The work concludes that Mandarins and Bootcamps hold considerable promise as methods for inducing voluntary progressive environmental practices by firms.

	Club Standards	
Enforcement Rules	Stringent	Lenient
Credible	*Mandarins*	*Bootcamps*
Non-credible	*Country Clubs*	*Greenwashes*

Table 4: Typology of Clubs, adapted from Prakash and Potoski (2006)

Prakash and Potoski expand the ability to predict environmental outcomes by including political and regulatory contexts, and the internal policies of the club. Their analysis contextualizes the choice of an

actor (here a firm) to enter a club and shows how club regulations may predict environmental outcomes. The two types of clubs they predict create public value in the form of environmental outcomes are Mandarins and Bootcamps. The greater network effects and economies of scale of Bootcamps make them competitive with the higher standards of Mandarins. The Bootcamps may have low club standards, but their broad membership may, in the aggregate, result the creation of public value in excess of the relatively few Mandarins with high standards. This work identifies two important variables, but also identifies challenges to the understanding of club goods. As the authors state, the "key analytical challenge is to link clubs' institutional design to their efficacy," and some elements of the institutional design remain exogenous to the model (Prakash and Potoski 2006, 174). The authors' later work more explicitly outlines an eminent challenge to the effective use of third-party certification: "overpopulation" of clubs within the same issue space (Potoski and Prakash 2012). Importantly for this dissertation, this suggests that future research examine the impact of additional third-party certification on public policy outcomes.

Empirical Work on Third-party Certifications

The third epoch of individual environmental ethics has seen an increase of empirical research on the impact of third-party certifications. Empirical studies have tested if a preference for certified goods exists, and if there is a corresponding willingness to pay for certified. This research links demand for credence attributes to certification, and links credence certification to club membership or group membership goods (Aarset et al. 2000; Teisl, Roe, and Hicks 2002; Roheim, Asche, and Santos 2011; Sogn-Grundvåg, Larsen, and Young 2013; Blomquist, Bartolino, and Waldo 2015; Bronnmann and Asche 2016). However, the existing empirical literature infrequently tests theory of motivations across producers, groups and consumers; much of the empirical work has been to quantify preferences in consumers for certified goods, which speaks more to quantifying a market for certification, not testing

assumptions about the structure of relationships, predicting types of responses, and modeling for desirable public policy outcomes.

Using the distinction between testing for a preference, and testing the strength of a preference, I divide the existing empirical work into two types of tests. The first test I broadly call "market assessment." These studies assess the preference for a theoretical certification that has theoretical attributes. These studies do not use existing third-party certification; instead they pose questions on preferences for the concept of certifications. I make this distinction because this research assumes a relationship between hypothetical credence goods and certifications. The second type of empirical test I call "experimental." This type of empirical research presents a consumer with an experimental choice between a certified good and a non-certified option and models the willingness to pay for one over another. This type of research is an empirical test that allows for consumers preferences for the quality of the certification separate from the unobservable process that the certification demarcates. Both types of empirical research reveal consumer preferences; they vary on allowing for biased responses to specific certifications. Finally, some popular media, industry articles, and academic papers suggest that third-party certifications are not working as anticipated (Parkes et al. 2010; Jacquet et al. 2010). These media generally do not address theory but rely upon expertise to identify challenges to use of third-party certifications.

Market Assessment Literature

In a market assessment, defined above as a preference for a theoretical certification that has theoretical credence attribute, Holland and Wessells (1998) produced a conjoint analysis of attributes for salmon. A sample of 1,500 respondents ordered 9 different fresh salmon products with variable attributes of price, production information (farmed vs. wild vs. no information) and seafood safety inspection information, including inspection by the U.S. Department of Agriculture, Food and Drug Association, or no inspection information. The researchers fit the data using a rank-ordered logit model to estimate the most

important attribute. By far the most important was the certification of seafood safety done by outside inspection (Holland and Wessells 1998). The contribution of this approach is in identifying the relative strength of second party certification relative to other attributes. This research shows the potential for certification to influence the preferences of consumers. The weakness is the assessment of second party certification, and lack of analysis of the impact of multiple certifications on preference. This assessment research suggests the question: **How do consumers respond to certification in the market, and what impact do multiple certifications have on these findings?**

A second assessment was an attempt to quantify the price premium consumers were willing to pay for third-party certified seafood (Wessells, Johnston, and Donath 1999). This paper tested for differences by species, certifier, and household attributes. Three species were tested: cod, salmon and cocktail shrimp. Broadly, the factors that predicted a significant change in acceptance by the consumer were species, consumer preferences, and trust in the certifying agency (Wessells, Johnston, and Donath 1999, 1087). Consumers responded to price; an increase in the price of certified goods predicted the consumer choosing the alternative more often, though this differed by species. Secondly, individuals in the West Coast of the United States were more likely to choose certified salmon over uncertified. Four individual level characteristics predicted preference for certified goods: membership in an environmental organization, belief in overfishing, larger seafood budgets, and purchase of fresh as opposed to frozen seafood. Respondents to the survey "treated all tested agencies [for certification] equally, even when considering certifications offered by previously unknown agencies"(Wessells, Johnston, and Donath 1999, 1088). The finding that consumer responded equally to diverse certifications implies an opportunity for country clubs and greenwashes to mimic bootcamps and mandarins, and still be preferred by consumers. This is a significant implication, and one that must be tested if third-party certifications are to be accepted as an effective environmental policy tool. These findings suggest that future research should include consumer preferences in the form of self-identification as interested in

the environment and should test if consumers treat all certifications equally. If consumers cannot differentiate between certifications, then the motivation for producers to choose mandarins over bootcamps cannot be price premium alone. Consumers' equal treatment of diverse certifications suggests the potential breakdown in assumptions about the efficacy of third-party certifications, and that future research should test willingness to pay across certifications, and in the context of additional certifications.

A third paper testing the theoretical market for "ecolabeled" and non-ecolabeled seafood used random digit dialing and phone surveys to survey respondents in 1998 for the United States and in 1999 for Norway (Johnston et al. 2001). Respondents were asked to consider hypothetical questions about their preferences for ecolabeled and non-labeled cod and shrimp. The rationale for not using a specific ecolabel was that at the time of the research "no large-scale market for ecolabeled seafood existed" (Johnston et al. 2001, 21). This survey assigned a specific theoretical "certifying agency" for reach respondent, including NGO and government agencies (Johnston et al. 2001, 26). This research found significant differences between the preferences of US and Norwegian respondents and found significant differences in preference by species and by certifying agency. This work supports findings that consumers have preferences for certified goods and shows that under some sets of assumptions consumers will express preferences for ecolabeled foods with a stated willingness to pay a price premium. The large sample size (1,640 completed surveys in the US and 2,039 in Norway) and statistically significant findings advance the theoretical argument for the use of certifications and show differences in preference by the certifying agency. These findings support existing theory that consumers will choose certified goods and pay price premiums. However, this work holds the certifying agency constant; respondents do not state preferences in the context of multiple agencies. This research prompts the question: **How does the presence of multiple certifications in the same issue space impact consumer behavior?** This question suggests that future empirical research use actual

ecolabels and more closely match the marketplace for goods with competing certifications and suggests research into the effect of multiple certifications on stated preference for certified vs. uncertified goods.

Experimental Literature Review

Within the experimental assessments of the market for third-party certification is a test of willingness to pay and price elasticity for e coffee produced by members of clubs for living wages and controlled for store fixed effect, own store correlations, and price (Hainmueller, Hiscox, and Sequeira 2011). This paper uses experimental data from 26 stores in Connecticut, Massachusetts, Maine and Rhode Island to test the impact of the "Fair Trade" certification label on sales of goods at existing prices, and the price elasticity of demand for Fair Trade goods. The researchers found that goods with a Fair Trade label had a positive and significant impact on sales for two types of coffee. The price elasticity results were more nuanced: demand for the more expensive Fair Trade coffee was inelastic (own-price elasticity of .28 with .90 confidence interval) when changes in price were linked to Fair Trade certification, but demand for less expensive bulk coffee was elastic (own-price elasticity of -3.32 with .90 confidence interval). These findings suggest that any future research include both high and low-price goods in tests of willingness to pay for certification. The researchers assert that their sample was biased by including stores "associated with, among other things, relatively high prices and support for organic farming and organic causes" and higher incomes of shoppers (Hainmueller, Hiscox, and Sequeira 2011, 22). The strength of this study is in the large sample size, and related power in estimating price elasticity; the weakness is in generalizability due to bias in store types and want of individual demographic data such as income and education. This study suggests that future research include variance by store type, income in the region and control for the demographic characteristics of respondents.

> Problems in Practice An article assessing the divergent environmental qualities of fisheries certification schemes neatly summarized the challenge to third-party certification. The article stated that fish sustainability information provided through club membership is important to promote sustainability, however there are multiple clubs.

The authors evaluate 17 out of 29 fisheries certifications schemes (Parkes et al. 2010, 345). The certifications included "aimed to cover a range of different types of scheme to provide representative and informative coverage"; one might conclude that the other 12 certifications were not sufficiently distinct. Essentially this very evaluation identifies a problem with duplication of certifications: exhaustion by individuals attempting to distinguish between overlapping qualities. The authors conclude:

> "The challenge now is to maximize the value of fish sustainability information schemes in contributing to the overarching goal of a sustainable future for the oceans, by providing consumers and businesses with clearer, more accurate and more recent data, so that they can make properly informed choices when buying seafood" (Parkes et al. 2010, 355)

One challenge is establishing "clearer" recommendations from 29 competing certification schemes. Another challenge is communicating to consumers and businesses which of the 29 schemes match their preferences.

The problem of multiple clubs creating confusing for customers clubs in the practice of using club goods to achieve public policy goals has not gone unnoticed. IntraFish Media, the world's largest fish media source, in an article titled "Are sustainable seafood lists supposed to confuse?" wrote:

> For years, NGOs have produced "eat" and "avoid" lists for the world's seafood, and put a huge effort into distributing them far and wide. From the Monterey Bay Aquarium to Greenpeace to the IUCN, everyone wanted to have their say. The problem? After everyone's given their two cents, the overall message is confused (Seaman 2009).

The complaint has been noticed by an academic article arguing for third-party certification despite acknowledging "difficulties that may impede further progress, such as consumer confusion, and a lack of demonstrably improved conservation status for the fish that are meant to be protected" (Jacquet et al. 2010, 45). This article identifies over 60 consumer seafood guides, some of which are clubs, such as MSC, and others which are lists of recommended species. However, the difference between a fishery being certified sustainable by a club and a species being listed as a recommended species for consumers

interested in sustainability is not clear. This frustration with seafood certification suggests a systematic challenge to the effectiveness of third-party certification in practice and may suggest that the existing model is insufficient to predict the problem of multiple clubs seen in practice. These challenges suggest that the effectiveness of third-party certification be evaluated in the marketplace to test the theories of improved environmental outcomes. Two other papers state that the number of guides for sustainable fisheries, including club membership and list of best species, is over 200 (Seaman 2009; Roheim 2009)

A second stream of challenges to the application of third-party certification is in the creation of clubs that create certifications. In the arena of labor standards for the production of coffee the organization Fair Trade USA broke from Fair Trade International to become a separate entity in 2011 (Fairtrade International 2011). This shift was seen by other labor standards organizations as an attempt by Fair Trade USA to capture certification rents and to lower standards to accommodate larger coffee farms (Gram 2012). This suggests the incorporation of the motivations of a club or group owner separate from the utility of their membership. Finally, the popular literature also identifies the motivation of producers to misrepresent or falsely claim certification of a club good. A National Public Radio story from 2013 asks if third-party certifications of sustainability should be trusted:

> The debate swirling around the MSC and "sustainable" seafood echoes the debates about other industry programs that promise to protect the environment, from organic farming to energy-efficient appliances. Are the promises genuine or hype? (Zwerdling and Williams 2013)

In this case, the popular media is responding to questions about the efficacy of third-party certifications. Though not theoretical in nature or systematic in their analysis, these popular media stories suggest a phenomenon worthy of scholarly research: Are third-party certifications failing to support the public policy goal of sustainable fisheries? And if so, why?

Extensions to Third-party Certifications Frameworks

The preceding sections summarize the actors and characteristics inherent to club theory, and the application of club theory to achieve public policy objectives. Pure club theory argues that individuals

and institutions derive benefits from private, public and club goods, and assumes that club goods are excludable and non-subtractable in practice (Samuelson 1955, 1954; Buchanan 1965; Olson 1965; Ostrom 1990; Prakash and Potoski 2006). Information economics theory argues that some goods, called credence goods, have valuable unobservable characteristics that require costly search effort (Stigler 1961; Darby and Karni 1973). Credence goods that are certified to have unobservable characteristics similar to public policy objectives may shed light on producer activities, and may result in policy objectives without costly government intervention (Brandeis 1914; Prakash 2001; Prakash and Potoski 2000; Gereffi, Garcia-Johnson, and Sasser 2001). Recent scholarship has identified contextual factors that predict club goods realizing policy objectives, including enforcement rules, club standards, political contexts (Prakash and Potoski 2006).

I have synthesized the actors and their relationships into a simplified visual model shown below in Figure 1. The club is the body that creates standards for members to follow; standards may be stringent or lenient. The club oversees the third-party certification contractor (blue line) and grants the certifier the right to use the standards body logo (orange line). The third-party certification body observes (blue line) the producers of the club goods, and oversight over producers may be lenient or strict. If the standards are met, the third-party certifier grants the right to use a certification the (orange orange) to the club member, which they in turn display to the consumer. The consumer purchases the club good from the producer (green line), and may pay a price premium for certified goods, and the producer pays club dues for membership to the club and third-party certifier (green line). When these transactions proceed according to theory the club member adopts best practices (black line) which result in desired policy outcomes that are valued by consumers.

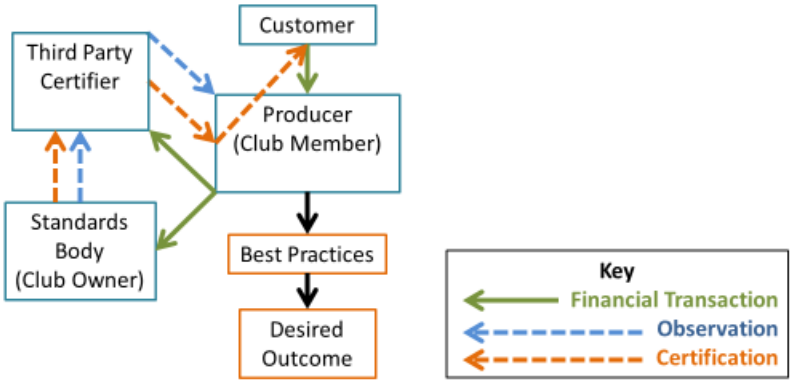

Figure 1: Existing Model of Third-party Certification

Two additions to the model may enable better predictions of outcomes. First, not all clubs are formed for the creation of public value; clubs may be institutions for maximizing benefits to members while distributing and minimizing costs regardless of public policy outcomes. Member benefits may be monetary, but they may also be altruistic, such as achieving environmental policy outcomes, or for social values such as reputational benefits. Without including the motivation of entrepreneurs who become club owners the use of third-party certification to successfully correct market failures remains only one of many possible outcomes. Club theory will be more complete, and models will produce more accurate predictions, by including the role of profit maximizing club owners and showing the impact of their agency on the ability of third-party certification to achieve policy objectives. Second, empirical work raises questions about end consumers' disambiguation between certifications, and the influence of competing certifications when predicting consumer choice. No work has been done to estimate the effect of many competing certifications on preference for certified goods, and it has been identified as hole in the existing literature. Club theory will be more complete if models of club theory predicts consumers' response to multiple third-party certified goods and shows how multiple certifications will affect the use of third-party certification to achieve policy objectives.

In this section I expand club theory by addressing the two challenges above. I model club owner agency and then show two types of implications. First, I show that a club theory that includes club owner

agency predicts entry and exit from the market for clubs. Second, I show that entry to the market for clubs suggests that outcomes may be predicted to more closely resemble those of common pool resources, such as a tragedy of the commons, than win-win-win outcomes predicted by club theory. Finally, I identify testable hypotheses derived from my expanded model.

Agency and Motivation of the Club Owner

The existing literature aligns the motivation for club rules with the benefits and costs faced by club members. Expanding agency to include the "club owner," defined as the individual or institution that creates rules, collects dues, and enforces member compliance, allows an alternative model of club rules, member behavior, and environmental outcomes. The agency of club owners is acknowledged, it is just little explored. Olson offers an example where "professional organizers… organize 'spontaneous grass root' meetings… to get those in the industry to write letters to their congressmen" (Olson 1965, 11). This is an assertion that club owners engage in activities that are intended to deceive in order to achieve club objectives. There is no reason to assume that club owners are benevolent actors that allocate club goods to members and adjust club cost simply to increase or decrease membership size. Prakash and Potoski state that "whatever their other virtues, clubs with few members may hardly be considered successful" (Prakash and Potoski 2006, 21). Success depends upon the measure. The assumption is that the utility of owners is a function of the membership level, or that a club owner's utility is no different from the members, and that the motivation of the owners is to diminish member costs and increase member benefits until benefits, costs and membership levels are at equilibrium—and this equilibrium is many members. If the club owner has agency, and may manipulate club costs and benefits, and increase utility separate from the members, then, from the perspective of the owner, they may well have a "successful" club with few members. By relaxing the simplifying assumption that owners and members have the same benefits I allow owners a utility function where the utility of the members plays a role but is not the sole motivation.

I adapt Buchanan's notation from Part 2 by using *O* to denote the utility of a club owner. Thus, the utility of individual club owner O^i, is a function of private and club goods:

$$(12) O^i = \left(X_1^i, X_2^i, \ldots, X_n^i;\ X_{n+1}^i, X_{n+2}^i, \ldots, X_{n+m}^i\right).$$

However, as the club owner they also derive utility from club dues from club members, which I denote as an additional type of good, X_m where X_m is a function of *N*, the number of club members:

$$(13) O^i = \left(X_1^i, X_2^i, \ldots, X_n^i;\ X_{n+1}^i, X_{n+2}^i, \ldots, X_{n+m}^i; (X_{m+1}^i, N), \left(X_{m+2}^i, N\right), \ldots, (\ X_{m+o}^i, N)\right)$$

This is simply the formal statement that club owners derive benefit from private goods, any club goods, and from club members, where benefits from club members are a function of club size. Parallel to the club member from Part 2, the sum of all goods for a club owner we define as O_j. This is defined to allow benefits (O_j) to be contrasted with production (O_r) in the same way as with a club member. Using lower case as partial derivatives o_j^i/o_r^i is the marginal rate of substitution in consumption between public, private, club and club member benefits and production. From this it follows that o_{Nj}^i/o_r^i is the marginal rate of substitution in terms of consumption between the size of the club and production.

Next, the simplified cost function for the club owner, *G*, is a function of the size of the club

$$(14) G = G^i\left[\left(X_1^i, N_1^i\right), \left(X_2^i, N_2^i\right), \ldots \left(X_{m+o}^i, N_{m+o}^i\right)\right],$$

and the total cost to an owner is G_j. This allows the marginal conditions for an owner to be shown just as Buchanan did for a club member (5). The marginal conditions for Pareto optimality with respect to each good must be when:

$$(15) o_j^i/o_r^i = g_j^i/g_r^i.$$

This shows the marginal rate of substitution between goods and money must be equal to the marginal rate of substitution between production of each. Taking the partial derivative with respect to *N*, the number of club members, we get:

(16)$o_{Nj}^{i}/o_{r}^{i} = g_{Nj}^{i}/g_{r}^{i}$.

This shows that the club owner is at equilibrium when the marginal benefit from adding a new club member is equal to the marginal cost. The partial derivative with respect to memberships shows when the club owner will wish to change the rules of the club to increase, or decrease club membership to maximize their utility, not the aggregate club members' utility. The partial derivative of the club owner's utility may be positive, negative or zero with respect to membership. In the case where it is positive, the owner would change rules to increase the membership of the club, despite potential loss of utility to the club members, when negative the owner would change rules to decrease membership, despite potential loss of utility to club members. Finally, we can assert the marginal conditions for optimal utility and cost faced by club owners

(17)$o_{j}^{i}/g_{j}^{i} = o_{r}^{i}/g_{r}^{i} = o_{Nj}^{i}/g_{Nr}^{i}$.

When (17) holds a club owner will have optimal benefits (O_j) from the club members *N*.

I do not suggest that the utility of the members fails to impact the owner; rather I suggest that it is one among many variables. In the instances where the benefits to the owners of the club are increased with a diminishing membership, one would predict that the owner of the club would either increase compliance costs to drive down membership until the utility maximizing number of members was reached. The value of specifying this variable in the utility function is to acknowledge the agency of the owner and clearly show that they are motivated in part by variables exogenous to the benefits to members, social costs, and environmental outcomes. More simply stated, the owners of clubs will change club standards to maximize their benefit, not that of club members. Benefits may include altruism toward club members or achieving a public policy objective such as environmental or social outcomes. The partial derivative of club owner benefit with respect to club size shows that allowing the club owner agency to differ from the utility of the members may result in stricter or more lenient club rules than optimal for members, or optimal for achieving public policy goals.

Motivation to Create Clubs

Recognizing club owners' agency implies a market for entrepreneurs to create or dissolve clubs to maximize owner benefit where benefits may be constrained by social bonds and may include altruistic benefits in addition to monetary benefits. Just as club owners may change club rules to increase or decrease club membership, entrepreneurs may enter or exit the market for clubs. Entrepreneurs will enter the market for certification until the marginal costs of entering the market equal the marginal benefits (17). This suggests four things. First, for some goods the market will support more than one certification, even all four types of clubs (Mandarins, Bootcamps, Country Clubs, and Greenwashes), or multiple clubs of each type. Second, in circumstance when the benefits to the owner are greater than benefits to the member, and benefits to owners are transparent, this framing would predict that an individual member would create new club, a "first party certification." This is analogous to Olson's privileged groups where members have the incentive to provide all the club benefits. Finally, as the number of clubs in the same issue space increase, and consumer confusion about club standards associated with each club increases, an incentive grows for club members to mimic club certifications to capture club owner benefits, including consumer price premiums, without paying for certification and without incurring costly changes to production practices.

Predicting Outcomes

Above I show that entrepreneurs enter the market for club goods, and that consumers will be faced with increasing choices between certifications in the same issue space. These findings have implications on the outcome when using a club good as a policy tool. The existing models for predicting outcomes when using third-party certifications as a public policy tool assume that outcomes is based on club member benefits that are non-subtractable, and benefits that are excludable. Under some circumstances these assumptions hold, but under others they may not. Given the expansion of the model to include the

motivation of club owners and club members, I identify circumstances where existing assumptions may not hold.

Subtractable Assumption

Current literature on third-party certifications has treated club goods as non-subtractable goods. The logic is that one firm having a certification does not preclude a second firm from having the same certification. Third-party certifications are non-subtractable in that a club owner may allow entry of multiple firms to the club. From the perspective of the club member the value of the certification to the producer is the consumer preference for third-party certified goods. The consumer preference may be expressed as a willingness to pay a price premium for a certified good, or it may be expressed as a preference for a certified good over the non-certified competitor. It is the consumer preference that motivates the producer to incur costly changes in production and incur oversight costs from third-party certifiers. If the consumers' preference for a certified good diminishes in the presence of alternative certifications in the same issue space, then the benefits of club membership and subsequent third-party certification is subtractable.

Competition for certified goods may occur in one of four contexts: between firms within the same club, between firms that are members of different clubs, between clubs, or between a firm within a club and a firm not within a club. Two factors may increase the subtractability of club member benefits to third-party certifications. These two factors may be summarized as quantity certified, and similar certifications. First, the benefits to club membership are more subtractable if the average willingness to pay for third-party certified goods decreases as the quantity of certified goods increases. Second, the club member benefits are more subtractable if willingness to pay for a third-party certified good diminishes with the increase of goods with similar certifications. If either of these two factors is true,

then the outcomes of third-party certifications may be more similar to subtractable goods than to non-subtractable goods.

Excludability Assumption

The second defining characteristic of club theory is excludability. Goods produced by club members have been framed as excludable goods because a firm could not claim to be a club member if they were not. I suggest that the benefits to firms are not excludable if the two following conditions exist: benefits to third-party certification may be competed away when additional clubs in enter the market for certification for the same credence characteristic, or if consumers do not differentiate between one certification and another. More generally, the benefits to third-party certification may be competed away if consumers view all certifications as equal, and if any institution can create a certification.

Subtractability	Quantity of certified good
	Quantity of certifications
Excludability	Entry into certification market
	Inability of consumers to discern between options

Table 5. Hypothetical variables that change outcomes of policy using club goods to outcomes resembling common pool resources

Above I showed how granting agency to club owners to maximize their benefits would induce the creation of clubs by entrepreneurs and by existing club members. Secondly, I hypothesized that consumers would be less able to differentiate between stringent and lenient club standards as the number of certifications in the same issue space increases. If these two hypotheses hold, then the benefits to a club good may be competed away by entry to the market for clubs and result in outcomes more similar to a non-excludable good. The implication of these two assertions is that third-party certifications may have outcomes better predicted by theory of non-excludable and subtractable goods than by club theory. Using the framework of excludability and subtractability the outcomes predicted would move from the lower left column of the typology of goods to the top right.

	Excludable	Non-excludable
Subtractable	**Private Goods** Food, clothing, housing	**Common Pool Resources** Fish stocks, grazing lands, timber
Non-subtractable	**Club Goods** Private parks, Cinemas, Certifications	**Public Goods** Clean air, national defense, lighthouse

Table 6: Club Good outcomes vs. Common Pool Resource Outcomes

This suggests that under some circumstances outcomes of club goods will be predicted by theory on common pool resources. The implication for policy makers is that public policy outcomes anticipated by use of third-party certification may not be realized if many certifications exist that are indiscernible by consumers. Instead, the outcomes m ay be better predicted by theory on common pool resources, including a tragedy of the commons.

Club Goods in a Tragedy of the Commons

Instances where the socially optimal number of clubs is greater than those provided by the market parallel the tragedy of the commons (Hardin 1968; Ostrom 1990). The tragedy of the commons is usually evoked for common pool resources that are defined as non-excludable and subtractable goods. The tragedy of the commons is characterized as when users have no barriers to a common pool resource. The resource users behave rationally and consume a common pool resource until their marginal benefits equal their marginal cost. The socially optimal consumption level may be higher, lower or equal to the aggregate consumption of individuals with open access. Individual resource users act logically to maximize their personal benefit, but their collective actions result in a "tragedy" when the socially optimal level of consumption is lower than the aggregate consumption. Thus, the entire society derives sub-optimal returns from the common pool resources despite each individual optimizing their individual consumption.

If third-party certification outcomes are similar to those of goods that are both subtractable and non-excludable in practice, then outcomes will be more similar to common pool resources. If there is market

entry to create clubs then entrepreneurs and club members will enter the market for clubs so long as their marginal benefits exceed their marginal costs. Entry into the market for clubs will result in establishment of clubs until marginal costs exceed marginal benefits. If benefits to club members are subtractable, then the provision of additional third-party certified goods in the same issue space as existing third-party certified goods will diminish the value of all third-party certified goods. Instances where the social utility maximizing provision of clubs is less than those created through market entry to clubs will result in sub-optimal outcome. In this case the incentives between consumer, club members and club owners may become re-aligned from one that predicts a win-win-win outcome to one that instead produces an outcome similar to a tragedy of the commons. If policy makers neglect this fact, then policies intended to create win-win-win outcomes may instead result in lose-lose-lose outcomes where consumers cannot use producer club membership to differentiate between credence attributes, firms producing credence attributes are not rewarded with price premiums or additional market share and public policy outcomes are not achieved. This finding does not imply that all issue-spaces with free entry to the market for clubs will immediately result in a tragedy of the commons, but it does that the incentives are now pointing toward an outcome antithetical to the commonly cited win-win-win. In an environmental policy epoch where the focus is on empowering end users to dictate environmental policy outcomes, the possible misalignment of incentives when using third-party certifications to achieve environmental policy tools suggests a more cautious prescription.

Future Research

Future research may test the essential linkages of benefits to club membership. The first linkage is the ability of club members to capture benefits of club membership when there is additional market entry to clubs in the same issues space. This linkage may be price premium or market share. The second linkage is the ability for new clubs to treated by customers as existing clubs.

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Chapter 2

Jumping Ship: Moving Between Clubs or Creating New Clubs

Abstract

In this paper I argue existing club members have unique insight into benefits of club owners and are motivated by this information to switch to competing clubs or create competing clubs in the same issue-space. Club owner benefits are unique from club member benefits and include establishing the process for accepting new members, setting club standards and club reporting mechanisms. This framing suggests that club members may quit their club membership, join alternative clubs, or create new clubs, where net benefits to club members are greater, or create new clubs to capture benefits formerly available only to club owners. In this research I use a case study of the U.S. Alaska pollock fishery and use qualitative methods to explore agency, motivation, and ability of club members to switch membership between clubs and create new clubs. This research uses a case study of the U.S. Alaska pollock fishery which was certified as sustainable by the Marine Stewardship Council in 2005 but then sought a certification of sustainable fisheries practices from Responsible Fisheries Management in 2011, resulting in the U.S. Alaska pollock fishery having membership in two clubs in the same issue-space. This research traces the motivations of the U.S. Alaska pollock fishery through the decision to join each club for sustainability. I conduct semi-structured interviews (n=15) with representatives of the U.S. Alaska pollock fishery to establish perceived costs and benefits of joining first one club, then another club in the same issue-space. The findings suggest that the more certification clubs enter a market the less incentive firms may have to follow conservation practices, which may lead to environmental outcomes similar to an open-access tragedy of the commons.

Research Question

The research question for this paper is: ***Will the addition of new certification clubs in a market reduce the incentive for firms to pursue conservation practices?*** This research is an effort to extend club theory by allowing examining change in club member benefits and costs due to actions by club members, action of club owners and market forces. In this case club members are firms that apply to meet standards of clubs to gain club benefits. Club owners are defined as the individual or institution that creates rules, collects dues, and enforces club member compliance (Buchanan 1965; Gudmundsson and Wessells 2000; Prakash and Potoski 2006). The outcomes of firm behavior of adopting conservation practices is predicted to be a function of club member benefits, including social and monetary benefits, that motivate firms to voluntarily join clubs that have established standards for environmental practices

(Buchanan 1965; Gudmundsson and Wessells 2000; Bronnmann and Asche 2016). If the motivation to join a club is a necessary step for firms to join clubs, change production to meet club standards and subsequent changes in environmental outcome, then the motivations to join a club may predict environmental outcomes. This logic suggests a dynamic market for clubs where motivations may change and result in changes in predicted environmental outcomes. To narrow the broad research question to a case study within the context of clubs for environmental characteristics of sustainable fisheries I ask: What motivates club members to join new clubs or create new clubs? For this research I use the case study of the U.S. Alaska pollock fishery to examine motivations of club members to switch clubs or create new clubs in the same issue-space.

Organization

This research is organized as follows. The Context section provides a summary of relevant literature, as well as statement of research questions and related hypotheses. Next is the Case section that provides relevant history of the U.S. Alaska pollock fishery used as a case study. The Methods section details the semi-structured interviews and sampling based on snowball technique. Findings are organized in four parts that summarize changing motivations of the U.S. Alaska pollock fishery to join the Marine Stewardship Council club and then the Responsible Fisheries Management club for sustainable fisheries. Conclusions address the hypotheses and Contribution summarizes what I believe to be the increment to knowledge about club theory made as a result of this research.

Context

Economic theory categorizes goods by two variables: subtractability and excludability (Samuelson 1954; Ostrom 1990 among many). Excludability is the ability to prevent others from consuming a good or service. The classical example of excludability is a lighthouse where all captains can use a lighthouse beacon as an aid to navigation regardless of if they have contributed to the lighthouse. The second

variable is subtractability. A good is subtractable if consumption by one individual precludes consumption by another; if one person consumes an entire apple another may not consume the same apple. The set of goods defined by excludability and subtractability are private, common pool, club and public goods. Table 1 shows the typology of goods. Of interest to this research are club goods. Club goods are defined to be excludable and non-subtractable (Buchanan 1965). Club benefits may be enjoyed by multiple club members without subtractability and non-members are excluded from those benefits.

	Excludable	**Non-excludable**
Subtractable	**Private Goods** Food, clothing, housing	**Common Pool Resources** Fish stocks, grazing lands, timber
Non-subtractable	**Club Goods** Private parks, cinemas, certifications	**Public Goods** Clean air, national defense, lighthouse

Table 1 Typology of Goods

One utility of this framing is the predictive power of outcomes as a result of matching public policy tools to this typology of goods. For example, the private sector is predicted to be a poor provider of public goods (those goods that are non-subtractable and non-excludable) because firms may not exclude consumers who have not paid for the production of the goods. By the same rationale the private sector is predicted to be a poor provider of common pool resources (those that are subtractable and non-excludable) because it has no way to prevent individuals from consuming the good. Another use of this typology is to identify known failures that may be prevented through public policy. Open access to common pool resources may result in actors consuming resources until their marginal cost equals marginal benefit, which means that aggregate individual consumption may exceed socially optimal consumption. This outcome, commonly called the tragedy of the commons, is predicted by pairing common pool resources and open access public policy (Malthus 1798; Pigou 1920; Coase 1960; Hardin

1968; Ostrom 1990). Another use of the typology is to identify public policy tools that take advantage of the characteristics of goods to realize public policy objectives.

In addition to characteristics of excludability and subtractability goods have sets of attributes for which consumers are willing to pay. Consumers incur costs for goods in the form of price and the cost of finding the good or "search cost" (Stigler 1961). Goods have observable attributes, including search costs, and attributes assessable through inspection, or experience, such as taste (Lancaster 1966; Nelson 1970). Attributes such as method of production are termed "credence attributes" and are neither observable through inspection nor can they be assessed through experience (Darby and Karni 1973). Trusted information on credence attributes reduces search costs and is valuable to consumers who would otherwise incur search costs for the credence attribute. A method to provide information about unobserved credence attributes is the use of certified information about credence attributes (Holland and Wessells 1998; Gereffi, Garcia-Johnson, and Sasser 2001; Wessells 2002). Certification of information is characterized by the party establishing rules and reporting compliance for certification. First-party certification is when a firm develops internal rules, complies with those rules and reports on adherence. Second-party certification is when an industry or trade group creates the standards and reporting compliance mechanism. Third-party certification relies upon an external organization to develop rules and reporting compliance, and fourth-party certification is when government or multilateral agencies create standards and reporting compliance mechanisms (Gereffi, Garcia-Johnson, and Sasser 2001).

The optimal number of clubs within a market may be modeled. Existing models include the congestion of clubs as a function of linearity of scaling costs and intensity of use of club services, and the provision of clubs by entrepreneurs or co-operatives motivation by provision of club goods for public consumption (Boadway 1980; Berglas 1981; Hearne 1988). Costs of scaling a club may be internal or external (Kennedy 1990). Internal scaling economies are when it is less expensive for a club owner to provide

service additional club members than it is to create a new club. External scaling economies are when enabling additional club members incurs additional costs external to the club, such as airport facilities for airlines that are members of the airport club. In the case of clubs for changes in firm behavior, such as modifying environmental practices, the scaling costs are internal. The third-party certification of firm behavior has internal scale economies and may be provided by purposively motivated co-operatives (or non-governmental organizations NGOs) or entrepreneurs. The optimal number of clubs for fisheries practices relies upon the heterogeneous internal costs and benefit structures for individual clubs, markets and fisheries and is not easily generalized.

This research focuses on third-party certification of credence attributes for two reasons. First, the number of third-party certifications for environmental credence attributes has increased from 50 certifications in 1990 to 350 by 2012 and is currently estimated at over 460 different certification in 25 issue-spaces in 199 countries (Resolve 2012; Ecolabel 2018). The proliferation of third-party certifications is paralleled by scholarly work associating third-party certifications with environmental outcomes (Gudmundsson and Wessells 2000; Prakash 2001; Potoski and Prakash 2005a; Prakash and Potoski 2006; Uchida et al. 2014; Wakamatsu 2014). Second, third-party certification may be supplemented or supplanted by fourth-party certification by policy-makers. An example of entry of a fourth-party certification to the market for credence attributes is the shift from dominance of third-party certifications of organic food in the United States to fourth-party certification of organic. In 2000 over 40 third-party certifications of organic existed within the United States (Fetter and Caswell 2002). The United States Congress created a National Organic Program (NOP) under the Agricultural Marketing Service, an arm of the United States Department of Agriculture (USDA). The NOP set standards for organic products in 2002 (Jaffee and Howard 2010). By 2010 the USDA standard of organic dominated the market for organic certification (Jaffee and Howard 2010).

Theory describes a mechanism to pair good characteristics of excludability and subtractability and credence attributes verified through third-party certification to achieve a public policy objective. Firms may choose to adhere to a voluntary standard of production specified by a club that results in a credence attribute, and in turn receive club benefits that are excludable and non-subtractable (Buchanan 1965; Gudmundsson and Wessells 2000; Prakash and Potoski 2007, 2000; Potoski and Prakash 2005a). The use of clubs for voluntary standards of production presents a unique opportunity in cases where the firms produce goods that have credence attributes. Third-party certification of goods produced by club members is proposed as a market-based solution that addresses imperfect information with the advantages of cooperative relationships, lower regulator costs, and the provision of a good that meets market demand (Mattoo and Singh 1994; Prakash 2001; Potoski and Prakash 2004, 2005a). Environmental policy theory identifies possible "win-win-win" outcomes for consumers, producers and policy makers. In this scenario consumers have preferences for credence attributes of environmentally sensitive methods of production identified by a club's third-party certification of a product, club members who produce these third-party certified products receive benefits of price premiums or market share unavailable to firms who are not club members, and policy makers forgo costly command and control tools for low cost market-based tools (Prakash 1999; Potoski and Prakash 2004; Prakash 2001; Mattoo and Singh 1994; Gudmundsson and Wessells 2000). This "win-win-win" scenario may dissipate if new club owners can freely enter a market if consumers lose the ability to discern the credence values among competing club certifications.

Finally, institutional theory provides a framework for predicting the collective action of club members. Members may behave as rational actors that optimize across economic and social benefits and costs (Olson 1965). In this framing club members make decisions about membership and evaluate costs and benefits of allowing additional members. Each individual member must choose if he or she will contribute to the club benefit or freeride, and choose levels of enforcement for club rules (Olson 1965,

17, 49–50, 65). Freeriding by individual members may be mitigated by reporting mechanisms, which may vary from strong to weak reporting mechanisms (Potoski and Prakash 2005b; Prakash and Gugerty 2010). Olson also defines three types of groups, “privileged” groups where some, if not all, members will reap greater group benefit than the cost of providing the group for the entire group, “latent” where a club member could freeride with no noticeable change in provision of club goods and “intermediate” where freeriding will be noticed. Privileged members have an incentive to provide all of the collective good, even if they must pay the full cost of provision (Olson 1965, 49–50). Olson categorizes size of group by large, small, or federalized; in small groups, social and economic impacts may be made by members, and observed by other members. Exclusive goods are bounded in quantity demanded, so additional supply decreases the price commanded by any one producer (Olson 1965, 37–38). In these cases, social and economic impacts may predict the behavior of individual club members (Olson 1965, 62). More recent scholarship models the types of clubs likely to be formed as a function of regulatory contexts. Prakash and Potoski suggest two variables predict club membership: reputational benefits to club members and regulatory context (Prakash and Potoski 2006, 78–79). These authors also identify that club owners can alter benefits and costs to club members through required standards of production and reporting, which may be weak or strong (Potoski and Prakash 2005b; Prakash and Gugerty 2010). To the extent that benefits to club owners are a function of standards, monitoring, and number of club members, the club owners may unilaterally change club rules to maximize benefits to club owners. These changes may include changing environmental standards, adding new standards, changing monitoring practices or the process of new member review.

Size of Group:		Large		Small		Federalized	
Type of Good:		Exclusive	Inclusive	Exclusive	Inclusive	Exclusive	Inclusive
Type of Group:	Privileged						
	Latent						
	Intermediate						

Table 2 Typology of groups, derived from Olson (1965)

The use of clubs for voluntary practices may be particularly useful in marine contexts where assessing outcomes is often more difficult resulting in contradictory policy recommendations in evaluations of the same species in the same context (for example, Roberts 2002; Hilborn, Annala, and Holland 2006). Existing case studies within the marine resource issue space offer evidence of the successful pairing of consumer preferences for credence attributes denoted by third-party certification and price premiums for club member firms (Aarset et al. 2000; Roheim, Asche, and Santos 2011; Sogn-Grundvåg, Larsen, and Young 2013; Asche et al. 2013; Sogn-Grundvåg, Larsen, and Young 2014; Ankamah-Yeboah, Nielsen, and Nielsen 2016; Bronnmann and Asche 2016).

The market for third-party certifications of credence attributes in fisheries has grown dramatically. In 2000 one of the first clubs for sustainable fisheries, the Marine Stewardship Council (MSC), certified the Thames herring and Western Australian rock lobster fisheries as the first fisheries to meet their standard for sustainable fisheries practices (MSC 2018b). Since then over 30 additional certifications of sustainability of fisheries have been developed and over 60 consumer seafood guides (Parkes et al. 2010; Jacquet et al. 2010). In this context the club members no longer evaluate only the benefits and costs of entering a club for sustainability, they may evaluate competing clubs in the same issue-space.

The existing literature identifies an elegant market-based solution to incentivize firms to voluntarily join a club with elevated environmental standards of production that rewards membership with excludable and non-subtractable benefits. Less explored is how club members behave if multiple clubs enter the same issues-space, or how club owners enter the market for clubs or alter club standards to entice new membership, retain existing membership, or capture benefits for club owners. Individual clubs are excludable; if a firm is not a club member, then they cannot legitimately produce goods bearing the third-party certification of the club. The policy rationale for the use of clubs is the alignment of incentives between firms and consumers to achieve a low-cost public policy outcome, a win-win-win outcome. However, the motivation of membership in any individual club is a function of monetary and

social benefits. If another club in the same issue-space may be formed that offers the third-party certification of goods and consumers do not differentiate between one certification and another, then a club member may capture the same benefits from multiple clubs. More generally, benefits to third-party certification are not unique if an institution can create or join a new certification in an existing issue space, and the new institution is treated as equal. In such a case, the benefits of club membership may be equal across clubs, but the compliance costs may vary, resulting in firms incentivized to join the club with the lowest cost of compliance. In such a context the incentives between consumer, producer and clubs may become re-aligned from one that predicts a win-win-win outcome. An alternative may be a realignment of incentives that may produce a lose-lose-lose outcome where consumers cannot use third-party certification to differentiate between credence attributes, firms producing credence attributes are not rewarded with price premiums or additional market share and public policy outcomes are not achieved. This outcome would be more similar to a tragedy of the commons where additional clubs enter the market for third-party certification and compete as a function of lower compliance costs that are now aligned to reward clubs with little or no environmental standards of production. In such a case the choice set for the club member now includes the option to join an existing club, but also the choice of membership among alternative clubs to reap the same or similar benefits. Finally, if there is no barrier to the entry of clubs, then a club member may choose to create a new club to compete with an existing club. In this case the benefits of club ownership are pertinent to a member. The visibility of club owner benefits would then become important to club members who weigh the cost of club creation with the benefits of membership in a new club and the benefits to club ownership.

My research question is: ***Will the addition of new certification clubs in a market reduce the incentive for firms to pursue conservation practices?*** For this research question, I explore competition among clubs through the motivation of club members to switch clubs or to create new clubs in the same issue-space. The two hypotheses are:

H1: Club members act to create new clubs or join new clubs in the same issue space when they perceive benefits to owners exceed benefits to club members.

Relaxing the assumption of excludability of benefits to club members suggests firms will be motivated to create new clubs or move to other clubs in the same issue space when club owner benefits are visible to club members. This hypothesis explores a one component of excludability of clubs, the motivation to switch clubs or create clubs.

H2: Club members who are members of privileged groups can create or join additional clubs in the same issue space.

In this case the existing club member may choose to join multiple clubs or abandon an existing club in favor of a competing club with superior net benefits. If there is free entry to the creation of clubs, then the club member may also choose to create a new club. This hypothesis explores the motivations of existing club members to transition between clubs or transition from club member to club owner by creating their own clubs. If the club member is part of a privileged group, then it faces the lowest bar to switching groups, limiting the generalization of the findings.

If there is free market entry to create new clubs, then the incentives may no longer align to achieve conservation objectives. It is possible that, as the number of clubs in a market increases, environmental outcomes will become similar to either common pool resources or public goods under an open-access regime.

	Excludable	**Non-excludable**
Subtractable	**Private Goods** Food, clothing, housing	**Common Pool Resources** Fish stocks, grazing lands, timber
Non-subtractable	**Club Goods** Private parks, Cinemas, Certifications	**Public Goods** Clean air, national defense

Table 3 Theorized movement between types of goods

In this case there may be free entry into the market for clubs until the marginal cost of creating a club equals the marginal benefit. No guarantee exists that the aggregate number of clubs will be socially optimal, suggesting that a market-based approach to the provision of clubs to create standards for credence attributes to result in desired environmental policy outcomes may require revision. The win-win-win scenario of a club good serving as a low-cost policy tool to enable consumers to express preferences for environmentally friendly goods and producers to be rewarded for high environmental standards may not hold. A failure to align incentives to join clubs and adhere to environmental standards of production may have subsequent implications on resource management. Instead of win-win-win outcomes, the prediction is that a certification may have less impact on harvesting practices as the number of certifications increases, which means that the resource will be increasingly harvested as it would have been prior to the use of clubs to improve environmental outcomes. In such a scenario the number of clubs is produced to achieve a lose-lose-lose outcome where consumers cannot differentiate between clubs, cannot express preference for environmentally sound production models, and responsible producers are rewarded neither by higher prices, nor greater market share. In some instances, this may return the resource to a tragedy of the commons.

Case Selection: North Pacific Pollock Fishery

The North Pacific pollock fishery spans U.S. and Russian waters. The fishery was first exploited by Japanese and Soviet fleets after World War II, which led to the developing a market surimi, a form of processed pollock (Hitz 1970, 2012; Bailey 2013; Strong and Criddle 2013). At the peak in 1972-1973 almost 2 million tons of pollock were being caught by foreign fleets in the Bering Sea (Strong and Criddle 2013). Beginning in 1976 foreign fisheries were excluded through three pieces of federal regulation. First, the Magnuson-Stevens Fishery Conservation and Management Act of 1976 created national

standards of conservation and management establishing regional fisheries management councils which set catch limits based on best available science (Strong and Criddle 2013, 12). Next, the Processor Preference Amendment of 1978 and the American Fisheries Promotion Act of 1980 limited foreign access, and promoted U.S.-foreign joint ventures which peaked in 1987 (*American Fisheries Promotion Act* 1980). Third, the 1998 American Fisheries Act and limited foreign ownership in catching and processing vessels to 25%. The American Fisheries Act established a list of qualified vessels to fish for pollock in the Bering Sea and allocated quota shares for the right to catch pollock based on historic participation (Bailey 2013, 166–70; Strong and Criddle 2013, 83–98).

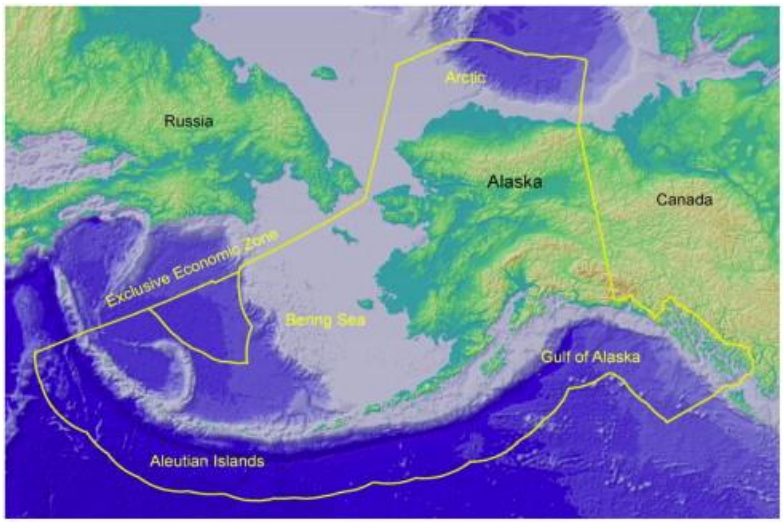

Figure 1 United States 200-mile EEZ off Alaska (Strong and Criddle 2013)

In the North Pacific the species commonly referred to as Alaska pollock[1] is caught in both the U.S. and Russian Exclusive Economic Zones and is the largest human food fishery by biomass in the world with 3.2 million tons landed in 2014 (FAO 2016, 14). The fishery is the largest fishery in the United States comprising 40% of the US fish catch (Bailey 2013, 13). Outside the U.S. the Alaska pollock is also the largest human food fishery in the world by mass (Bailey 2013). The combined U.S. and Russian Alaska pollock fisheries play an important role for large retailers such as Walmart and McDonald's. In 1985

[1] A note on nomenclature. The pollock species *Theragra chalcogramma* is colloquially termed "Alaska pollock." In limited instances I refer to the fish as "Alaska pollock." I refer to the U.S. fishery for Alaska pollock as the "U.S. Alaska pollock fishery" and the Russian fishery for Alaska pollock as the "Russian Alaska pollock fishery."

Trident Seafoods began providing frozen breaded pollock to Long John Silver's to substitute for the more expensive frozen Atlantic cod. Later, Alaska pollock was adopted by McDonald's for fish sandwiches (Strong and Criddle 2013, 29). Walmart sells pollock in several forms of frozen food, including fish sticks and fillets. Walmart and McDonald's articulate policies for buying certified sustainable seafood and make public updates to those polices on their websites (Walmart 2011, 2018; McDonald's 2018). The U.S. Alaska pollock fishery has also been influenced by groups interested in the governance of public resources, sustainable fisheries and marine mammal protection. The possible impact of the pollock fishery on the Endangered Species Act listed population of Western Aleutian Steller sea lions, the volume of catch, and the methods of capture inspired the environmental activist organization Greenpeace to protest fishing vessels in Seattle from 1996 to 1998 (Patton and Stump 1997; Westneat 1996a, 1996b; Cavanagh 1997; Bailey 2013, 140).

In 2000 the U.S. Alaska pollock fishery began the process to be certified by Marine Stewardship Council (MSC) as achieving sustainable fishing practices. In 2005 the U.S. Alaska pollock fishery was certified as "sustainable" for having met the criteria for sustainability set by MSC (Chaffee et al. 2005). The MSC certification was granted to the At-sea Processors Association, a trade association representing the catcher processor vessels within the U.S. Alaska pollock fishery. The At-sea Processors Association granted the other parts of the U.S. Alaska pollock fishery the right to use the MSC certification. The MSC certification carries a tiered logo licensing fee paid by the entity that sells to the end consumer, such as grocery store. Entities with annual sales over £40M are charged a royalty rate of 0.3% for all consumer facing products sold with the MSC logo (MSC 2016). An entity selling MSC certified pollock in bulk to an intermediate processor would not face a direct licensing fee, though the increase may be reflected in a decrease in the price an intermediate processor would be willing to pay.

For eight years the U.S. Alaska pollock fishery was the only MSC certified Alaska pollock available. In 2008 the Russian Sea of Okhotsk pollock fishery applied to be certified as sustainable by MSC. In 2013

the Alaska pollock caught in Russian Sea of Okhotsk, a substitute to Alaska pollock from U.S. waters, was certified by MSC as a sustainable fishery. The certification granted to the Russian Alaska pollock fishery carried a number of conditions that the fishery will need to meet in order to have certification renewed (O'Boyle et al. 2013). The certification of Russian Alaska pollock was protested by the U.S. Alaska pollock fishery industry including written objections to the certification process for perceptions of scores being inflated (Tavel Certification 2008; O'Boyle et al. 2012). The U.S. Alaska pollock fishery was recertified by MSC 2016 (Bowen, Rice, and Trumble 2016). The Russian Alaska pollock industry began renewal in 2017 and is ongoing as of winter 2018. As of February 2018, the published timeline on the MSC website anticipates a decision on the renewal of Sea of Okhotsk pollock fishery in September 2018 .

Responsible Fisheries Management certification (RFM) is an alternative seafood certification club run by the Alaska Seafood Marketing Institute (ASMI) and Global Trust (Tkacz 2012). The RFM certification follows FAO standards of sustainability and does not carry a logo licensing fee (ASMI 2013). The U.S. Alaska pollock industry applied to RFM for certification two years after the Russian Sea of Okhotsk pollock fisher began the application process for MSC certification of sustainability. The U.S. Alaska pollock fishery was certified as sustainable by RFM in 2011 (Global Trust 2011). The RFM certification period is 5 years and the U.S. Alaska pollock fishery was recertified by ASMI as sustainable in December 2017 ("ASMI" 2017; "ASMI" 2018). In addition to RFM many alternative third-party certifications have been developed. By 2010 there were a minimum of 30 certifications and a maximum of 60 certifications or fish guides to sustainability (Parkes et al. 2010; Jacquet et al. 2010). Fish consumption guides, such as the Monterrey Bay Aquarium are not certifications of sustainability denoted on the packaging of a fishery product but are designed to similarly influence consumer behavior to choose species caught in a manner consistent an internal definition of sustainability.

In 2018 the U.S. portion of the pollock fishery is certified as sustainable by the Marine Stewardship Council (MSC) and the Responsible Fisheries Management program (RFM). The Russian Sea of Okhotsk

portion of the Alaska pollock fishery is certified as sustainable by MSC, but not by RFM. Alaska pollock caught in Russia but outside of the Russian Sea of Okhotsk is not certified by either MSC or RFM. Each fishery faces certification options between competing clubs, including MSC and RFM among others. This presents the opportunity for a case study of motivations of club members, or potential club members, and actors creating new clubs in existing club issue space. The competing certifications provide the opportunity to explore the motivations of club members to choose club membership, switch clubs, or create its own club.

Methods

My research is on the motivations of club members to create new clubs or join new clubs. This research is qualitative work designed to garner insights into what causes club members to join new clubs. The hypotheses are that club member insights into club owner benefits influence decisions to switch clubs, and that club members who are members of privileged groups can create or join new clubs in the same issue space. The case study is of the U.S. Alaska pollock fishery decision to seek RFM certification of sustainability in addition to MSR certification of sustainability.

This research uses semi-structured interviews with open-ended questions. This research was reviewed by University of Washington Human Subjects Division (HSD), was found to constitute an exempt category of research, and was granted exempt status (IRB ID: STUDY00002233). In compliance HSD standards I informed interview subjects of my academic standing, research objectives and was granted consent before I interviewed any individual. Interviews notes were kept on a personal password protected computer. The advantages to this method include enabling respondents to tell their stories without hard constraints placed by the interviewer on the pertinent topic and freedom for the interviewee to share the causal mechanisms of their decision making process as they understand them (Piore 2006). The open-ended, semi-structured method enables further probing questions where the

interviewer does not understand the response, or is prompted by a question he could not have thought to ask (Piore 2006). Documenting the decision making processes "can be of critical use in exploring… political, cultural, and economic processes and practices of the past" (Giles-Vernick 2006, 86).

Challenges to semi-structured interviews include interpreting the opinions shared by interviewees, and establishing what can be verified (Giles-Vernick 2006). For this research I used two methods of verification: coherence of interviews responses with outside sources, and triangulation between different sectors of the U.S. Alaska pollock fishery. The background of federal management governing the U.S. Alaska pollock fishery, in conjunction with contemporary environmental and economic context, allowed me to contextualize interviewee responses with contemporary third-party accounts.

I used snowball sampling to identify the sample population of individuals to interview from the population of individuals identified by members of the U.S. Alaska pollock fishery as knowledgeable about the process of choosing and joining MSC and RFM certifications (Goodman 1961). The snowball sample method can be used when a random sample of individuals is not possible. In this case I did not have an exhaustive list of individuals who may be knowledgeable from which to draw a random sample, or an estimate of the relative level of knowledge of individuals in the population. The benefits of a random sample are well known and include an asymptotically unbiased sample. Alternately, the snowball sample procedure may be used at least two ways: to estimate a parameter and to use networks to gain access to knowledgeable sources. The parameter estimate approach uses ***s*** stages and ***k*** individuals to create a sample from a finite but unknown population. The procedure is as follows: an individual is drawn from the population then asked to name ***k*** individuals within the population. Those named individuals then form a new stage and they are asked to name ***k*** individuals, creating a new stage. The members of the new stage are asked to name ***k*** individuals until stage ***s*** is reached. This method allows for estimations of bias as a function of ***s*** and ***k*** (Goodman 1961). The objective of this research is not to create an unbiased estimator of a parameter and define confidence of that parameter,

but to build theory on motivations of club members. In the approach to snowball sampling used in this research the objective is to identify key informants and links to many individuals within the population.

For my sample I first identified leaders in the pollock fishery, beginning with attendees to the North Pacifica Fisheries Management Council (NPFMC). Second, I worked with Assoc. Prof. Dave Fluharty, an expert in North Pacific fisheries with nine years of experience on the NPFMC from 1994 to 2003, twenty years of on the NPFMC Ecosystem Committee, and widely known and respected in the pollock fishery, to identify individuals within the NPFMC to begin the snowball sampling technique and to pre-test semi-structured interview questions. I began with a list of 59 individuals and worked with Assoc. Prof. Fluharty to identify 9 individuals as key actors with knowledge about decision-making process of U.S. Alaska pollock fishery to join MSC and RFM. Additionally, each interviewee was asked to identify the typology of relevant actors within the Alaska pollock fishery and to recommend key individuals in each sector who were knowledgeable about MSC and RFM certification, and the motivations of the sector to join one, or both, of the third-party certifications.

I approached every key informant with an invitation for an interview over email, or, where possible, over the phone. Invitations for interviews followed best practices with graduated invitations if initial requests were ignored (Dillman, Smyth, and Christian 2014). Every interview included a request for recommendations of individuals knowledgeable on the topic. The name of every individual recommended was recorded, along with who made the recommendation. Any individual recommended by more than two people received an invitation for an interview. Of the 28 individuals invited, 15 were interviewed, a 54% success rate.

The pollock fishery is large but the number of individuals who make decisions about seeking MSC or RFM certification is limited to the Board of the At-sea Processors Association. There are four sectors that catch pollock in the Bering Sea and Aleutian Islands under the American Fisheries Act, and these are

represented by a few key trade associations. NOAA provides documentation on the sectors including, member vessels, owner companies, and catch by sector on its website (NOAA 2018). The four sectors of the pollock fishery and their total catch for 2017 are:

Sector	Total Catch (tons)	Quota (tons)	Percent of Quota
AFA Inshore	589,851.00	590,995.00	44.8%
AFA Catcher Processor	472,736.00	472,796.00	35.9%
AFA Mothership	118,181.00	118,199.00	9.0%
Community Development Quota	136,332.00	136,400.00	10.3%
Total	1,317,100.00	1,318,390.00	100%

Table 4 Sector and catch summary for 2017 (NOAA 2018)

There are 21 vessels that catch pollock under the AFA Catcher Processor sector which, due to some vessels organized as a Limited Liability Corporation (LLC) under the same management, are owned by eight entities (NOAA 2017). I interviewed representatives from 5 of the 8 companies, and one representative of the At-sea Processors Association. After each interview I asked the interviewee to summarize the typology of actors, and to identify individuals knowledgeable about the motivations to join MSC and RFM for this research within that typology. Over the course of the 15 interviews the respondents narrowed to the following typology of participants relevant to this research:

1) At-sea Processors	AP-02	AP-04	AP-06	AP-10	AP-15	AP-15
a. Represented by the At-sea Processors Association (APA)	AP-08					
2) Catcher vessels	CV-03	CV-09				
a. Represented by the United Catcher Boats (UCB)	CV-05	CV-11				
3) Government	GV-13	GV-07				
4) Consultants	CN-12	CN-01				

Table 5 Summary of interviews participants

The nomenclature for interviews is a two-letter code for the predominant group represented by the interviewee, followed by the chronological interview number. The four groups are the At-sea Processors (AP), Catcher Vessels (CV), Government (GV), and Consultants (CN). For example, interview AP-14 was the 14th interview and was conducted with a member most closely associated with at-sea processors.

I conducted in-person interviews and over the phone interviews during the summer and fall of 2017. The average interview length was 1 hour 40 minutes, with 15 interviewees, for a total of 25 hours. During interviews I took notes on a laptop computer. After each interview I reviewed notes, and followed best practices of identifying any areas for further clarification, and followed up with interviewees with additional questions when necessary (Gottlieb 2006). In a limited number of instances, I shared excerpts of my notes with the subject to ask for review or clarification. The average length of notes was approximately 10 double-spaced pages which was stored in a password protected computer.

I developed the interview questions to elicit responses on the motivation to join or leave third-party certification for the Alaska pollock fishery. Interview measures were the statements given by respondents to their motivations, the motivations of the group they represent, or their understanding of motivations to seek MSC or RFM certification. Consultants and government respondents provided information to confirm events that changed motivation of fishery respondents to seek club membership. I used semi-structured interviews to collect data on two hypotheses, the first of which is:

> **H1: Club members act to create new clubs or join new clubs in the same issue space when they perceive benefits to owners exceed benefits to club members.**

My framework suggests that actors who currently belong to one club will be motivated to create new clubs or move to other clubs in the same issue space if they may contrast club owner benefits with club member benefits. This hypothesis explores one component of excludability of clubs, the motivation to switch clubs or create clubs. For the U.S. Alaska pollock fishery case study I framed interview questions about motivations as questions of costs and benefits to joining MSC, then costs and benefits to joining RFM. To systematize research questions, I asked key informants how they analyzed potential membership in a club, and specifically asked about the benefits and costs associated with membership. Responses to these questions inform the motivation of club members (or potential members) when

choosing to join a club. In instances where the respondent was not a potential club member, such as a government representative, they were asked what they interpreted to be the motivations. These responses helped to provide context for motivations and confirmation of events that changed motivations to join a MSC or RFM. These questions address the perception of benefits and costs of club ownership and may address the question of transparency of benefits to club owners. The set of questions around benefits and costs were designed to understand how club members view the benefits of club members relative to club owners which control club rules governing club membership, including standards, monitoring and admittance. The semi-structured interview questions are below, and the full survey questions are included in Appendix 1.

Questions on Joining a Club: Benefits and Costs

Benefits

- *What are the benefits to an individual like you of getting a certification for sustainable seafood such as MSC or RFM certifications?*
- *Which of these benefits is most important to you?*
- *If you were to put these into a percentage, even if it is just a rough estimate, how would you break down the distribution of benefits to certification?*
- *Would anything be different if you were to think of the benefits from the perspective of the whole fishery, instead of from the perspective of an individual such as yourself?*
- *Thinking of just the benefits, can you contrast the benefits of getting Marine Stewardship Council (MSC) certification and Alaska Seafood (RFM) certification?*

Costs:

- *What are the costs or drawbacks to an individual like you of joining these certifications in general?*
- *If you were to put these into a percentage, even if it is just a rough estimate, how would you break down the costs and drawbacks to certification?*
- *Is there a way that MSC or RFM differs?*
- *Would anything be different if you were to think of the benefits from the perspective of the whole fishery, instead the perspective of an individual, such as yourself?*
- *Thinking of just the costs, can you contrast the costs or drawbacks of getting Marine Stewardship Council (MSC) certification and Alaska Seafood (RFM) certification?*

Hypothesis two addresses the ability of club members to change from one club to another, or to create a new club in the same issue space.

H2: Club members who are members of privileged groups can create or join additional clubs in the same issue space.

The second hypothesis explores the ability for incumbent club members to transition to an alternative or additional club, or a create a club. This hypothesis explores the ability to switch clubs or create clubs. To systematize research questions for hypothesis two I asked key informants how they analyzed a potential change from membership in one club against another club. The intent was to elicit insights into the evaluation process between clubs identify the motivations for membership in competing clubs and explore club member perceptions of club owner benefits. I also asked about changes that the club member would desire to see in club rules and benefits. This question was designed to elicit information on any misalignment between the cost and benefit structure of club members and club owners for each club. This also invited club members to articulate how they would structure club rules and invited comment on their own potential formation of a club and rules for club members. The questions on changing membership are below, and the full survey questions are included in Appendix 1.

Questions on changing club membership, and desired changes

Switching Certifications

- *The Alaska pollock fishery was certified by the Alaska Seafood Marketing Institute (RFM) as a sustainably harvested seafood, using the Food and Agriculture Organization (FAO) standards. This is in addition to the 2010 certification of Alaska pollock by MSC. Why do you think the fishery switched certifications, or choose to get both certifications?*

Making Changes

- *If you could make a change to either MSC or ASMI certifications, what would you change?*

Responses to the questions of why the fishery switched or received both MSC and RFM certification returned several possible rationales. I used semi-structured format to pursue each identified rationale to ensure I could identify common themes between respondents. One of the advantages of qualitative research, especially semi-structured interviews, is an opportunity for the researcher to collect information on exogenous variables that were not anticipated during theoretical review. In this research each respondent (fifteen out of fifteen respondents) provided historical context for their responses to

the perceived benefits, and then contrasted the benefits anticipated before MSC certification, with benefits realized early in club membership, and then those later in club membership.

Findings

The findings are organized in four parts organized chronologically with the evolution of U.S. Alaska pollock fishery perceptions of MSC between 2000 and 2018. First, I present findings summarizing motivations during the period between 2000 and 2008 and include the motivations to join MSC and associated costs. Second, I summarize the changes in perception of MSC beginning in 2008 when the Russian Alaska pollock fishery began the process of MSC. Third, I present the motivations for the U.S. Alaska pollock industry to leave MSC after the Russian Alaska pollock fishery had been certified by MSC. Fourth I present the motivation to seek RFM certification which began around 2009. The findings are summarized in Table 5 below with the count of the number of at-sea processors and At-sea Processors Association that expressed an opinion distinguished from the count of individuals from all sectors. Any idea expressed by two or more respondents is included. Appendix 2 contains the count of statements for each theme for all categories of respondent. For example, five out of seven At-sea Processors representatives and ten of fifteen respondents overall stated that they were initially motivated to join MSC to maximize profit.

Category	Type of Motivation	At-sea Processors		All Sectors	
		Count/7	%	Count/15	%
1a. Initial benefits to joining MSC	Profit	5	71%	10	67%
	Customer demand / Protection from Greenpeace	6	86%	9	60%
	Access to markets	6	86%	12	80%
1b. Initial costs to joining MSC	Monetary costs were trivial	5	71%	10	67%
	Staff time	3	43%	4	27%
2a. Reaction to MSC certification of Russian Alaska pollock fishery	Collusion between MSC and large buyers	3	43%	5	33%
	False assertions by Russian fishery	1	14%	2	13%
	MSC breaking its own rules	3	43%	8	53%
	U.S. pollock is no longer unique	5	71%	8	53%
2b. Subsequent Perceptions of MSC	MSC is a business	4	57%	8	53%
	MSC competes with U.S. pollock for benefits	1	14%	2	13%
3. Motivations to leave MSC	Avoid MSC blackmail	5	71%	7	47%
	No longer have price premium	4	57%	6	40%
	Fear arbitrary rule changes	5	71%	9	60%
4. Motivations to join RFM	Access to markets	3	43%	7	47%
	Provide checks and balances to MSC	4	57%	6	40%
	Block arbitrary rule change by MSC	2	29%	2	13%

Table 5 Summary of all findings

1 Initial Benefits and Costs of Club Membership (2000 to 2008)

Three themes dominate the initial motivation for membership in MSC. First is the desire to increase revenue from a price premium or increase in market share, second is a demand from customers for MSC certification who fear environmentalist targeting their industry, and third is access to European markets, specifically the German market.

Category	Type of Motivation	At-sea Processors		All Sectors	
		Count/7	%	Count/15	%
1a. Initial benefits to joining MSC	Profit	5	71%	10	67%
	Customer demand / Protection from Greenpeace	6	86%	9	60%
	Access to markets	6	86%	12	80%
1b. Initial costs to joining MSC	Monetary costs were trivial	5	71%	10	67%
	Staff time	3	43%	4	27%

Table 5.1 Summary of findings, Section 1a and 1b

Five of seven at-sea processors representatives and ten of fifteen representatives of all sectors stated the anticipated ability to command a price premium motivated them to join MSC. The value of MSC was characterized by the response that it commands in the marketplace, not the role that it plays in sustainability.

> *What motivates us is: Can I get 5 cents more? Can I get into a market my competitors can't? Will someone choose mine? People are looking for the advantages. Is it worth it or not worth it? In the end for me it is all about how much does it cost? Does it increase my competitiveness? (AP-06)*

> *I think it [MSC] is just kind of a game for people to look as responsible as possible while trying not to compromise too much on their ability to buy from the source with the right price. The price point drives most sales. Not sustainability. (AP-08)*

The second rationale for seeking membership in MSC was to accommodate at least one prominent customer and defend the fishery from protest by Greenpeace. Six of seven respondents of the at-sea processors and nine of ten respondents overall believed the U.S. Alaska pollock fishery was motivated to join MSC because they had trepidations that the group Greenpeace might target their business because of perceived unsustainable fishing practices. In the late 1990s Unilever, a major buyer[2] of pollock at the time, approached the At-sea Processors Association and suggested that the association should get MSC for fear of boycotts by Greenpeace. The U.S. Alaska pollock fishery was familiar with Greenpeace from conflicts over fishing practices in between 1996 and 1998. As one respondent characterized it:

> *Greenpeace boycotted Shell gas stations, somewhere in EU. This had noticeable impacts to Shell Oil company, at least at that operation. Unilever looked at Bird's Eye [a company owned by Unilever, and a producer of Alaska pollock products], and said, "we could be vulnerable." If these Greenpeace guys wanted to put some pressure on pollock, [then] they could start boycotting all of Unilever's products… Unilever was quite interested in getting this done. They said they will underwrite this. They stepped up and paid for the 3rd party certification of the pollock fishery. That is how the pollock fishery got into the certification game. It was done because the end user,*

[2] At-sea processor representatives think of the "customer" as the company or "buyer" that buys pollock product from them by the ton, not the person whom I will call the consumer who eats pollock in the form of fish sticks, surimi, or other pollock products. The one exception may be Trident Seafoods, which is a private and vertically integrated firm that catches, processes, and sells products to the consumer.

> *Unilever, through Bird's Eye, saw a potential liability. You have some Eco-NGOs that have shown willingness to rattle the cage. The companies say, "we are going to be protected from some of these organizations by having certifications." (AP-04)*

By joining MSC the U.S. Alaska pollock fishery could realize all three types of benefits: satisfying Unilever, protection from boycotts and a potential price premium.

The third motivation to join MSC was access to markets. Six of the seven at-sea processor representatives and twelve of the fifteen respondents overall stated that access to markets motivated their application for MSC certification. Each sector identified access to the European Union market as a benefit from MSC membership and many specifically identified the German market. MSC certification was not reported to be a benefit in the U.S. and Asia which are major markets for pollock in the form of fish sticks and surimi. Access to markets could include a price premium, or not:

> *Now in the European Union, Germany is one of the big buyers of Alaska pollock. In Germany the German consumer is more in tune with issues of suitability and so forth. So, the large retailer in Germany feel that certification is important in terms of getting consumers to buy the products in the supermarket. In Germany there may be a price premium that they are willing to pay. Or they will buy a certified but not buy a non-certified product. (AP-04)*

The response from this representative is binary: either you have a MSC certification logo on your pollock product, and you can sell in the European Union, or you don't have a MSC logo certification logo, and you can't sell in the European Union. In contrast, when segmenting the market between the European Union the U.S. and Asia, the benefits of membership were heterogeneous. One quote stands out because of the perceived equivalence of substitutes for MSC certification.

> *Pretty much everyone is doing business in EU, so they see the need for MSC and I don't know if for their Asian sales there is any demand. In the USA you get more [request for] "MSC or equivalent" (AP-08)*

The respondents from each of the four U.S pollock fishery categories stated they entered MSC for three reasons: profit, customer demand for protection from Greenpeace, and access to markets.

In contrast to the benefits (not estimated) the estimate of total monetary costs of initial certification by MSC borne by Unilever was estimated as $500K to $1M. Five of the seven at-sea respondents and ten of the fifteen total respondents assessed the monetary costs as minimal, or not a significant factor in the decision to join MSC. The perception of the cost differs by the sector of the U.S. Alaska pollock fishery respondent but in general the at-sea processors expressed their acceptance of the cost. Only one respondent mentioned the additional costs of carrying the MSC logo on the final product and the fee that carrying the MSC logo entails. The more important cost was time. The U.S. Alaska pollock fishery began certification in 2000 and received certification from MSC in 2005.

> *That [cost of certification] really doesn't enter into it. The cost of the certification is so small relative to the other things. It has a cost, but the cost of not having it is greater. Our decision to stick with it doesn't have to do with cost. (AP-04)*

> *Costs of MSC certification was staff time. Jim Gilmore and an economist. Company employees, review docs, and correct them when they were wrong. Went on for years. Had we picked a different certifier that was more organized and efficient it wouldn't have gone on so long. In those days co-ops were new and controversial. I think there was a lot of pressure from SCS [Scientific Certification Systems Inc.][3] not to certify the because of [Steller] sea lions. (AP-02)*

Early motivations to enter MSC certification by the At-sea Processors Association were an opportunity to meet the demand of Unilever, receive benefits in the form of potential price premiums, access to the European market, and protection from environmental activists. The costs were initially borne by Unilever and subsequently borne by the at-sea processors. At-sea processor did contribute staff time. The motivations conform to existing theory predicting club membership. Importantly, the at-sea processors hold the MSC certification, and they chose to share that with the rest of the U.S. Alaska pollock fishery sector:

> *We got the MSC certification and asked if anyone [other sectors of the U.S. Alaska pollock fishery] wanted in [to also be certified with MSC], and everyone wanted in. Catcher vessels don't incur the cost, or the inconvenience of working with MSC. In our fishery it [MSC certification] is*

[3] Scientific Certification Systems Inc. is the accredited certification body that conducted the initial assessment of the U.S. Alaska pollock fishery which concluded in 2005 with a decision to grant MSC certification (Chaffee et al. 2005)

held at the processor level, with our trade association [At-sea Processor Association] being the association that doesn't represent all the vessels. (AP-08)

This quote shows the at-sea processors were willing to incur the ongoing costs of MSC certification and then to share the benefit of third-party certification to the entire U.S. Alaska pollock sector. This makes the At-sea Processors Association a "privileged group" in Olson's typology of groups.

2 Certification of Russian Alaska pollock and Subsequent Perceptions of MSC

On September 24th, 2013, MSC certified the Russian Sea of Okhotsk Alaska pollock fishery as a sustainable fishery (O'Boyle et al. 2013). With this certification 800,000 tons of Russian Sea of Okhotsk Alaska pollock that had been sold without MSC certification could now be sold with MSC certification of sustainability. These 800,000 tons were in addition to the 1.2 million tons of MSC certified U.S. Alaska pollock fishery (NOAA 2013). The U.S. Alaska pollock fishery lost its monopoly on MSC certification of Alaska pollock. U.S. Alaska pollock fishery respondents shared four types of perceptions on the process of certifying the Russian Sea of Okhotsk pollock fishery, ranging from undue influence from large buyers, false assertions by the Russian Alaska pollock fishery and claims that MSC changed its own standards or accepted assertions they knew to be untrue. These themes changed the U.S. Alaska pollock fishery perceptions of MSC membership, which was afterward seen as a business and a competitor to U.S. Alaska pollock fishery interests because it granted MSC certification to the Sea of Okhotsk Russian Alaska pollock fishery where the management system was perceived to be less robust than the U.S.

Category	Type of Motivation	At-sea Processors		All Sectors	
		Count/7	%	Count/15	%
2a. Reaction to MSC certification of Russian Alaska pollock fishery	Collusion between MSC and large buyers	3	43%	5	33%
	False assertions by Russian fishery	1	14%	2	13%
	MSC breaking its own rules	3	43%	8	53%
	U.S. pollock is no longer unique	5	71%	8	53%
2b. Subsequent Perceptions of MSC	MSC is a business	4	57%	8	53%
	MSC competes with U.S. pollock for benefits	1	14%	2	13%

Table 5.2 Summary of findings, Section 2a and 2b

Three of the seven respondents of the at-sea processors and five of fifteen respondents from all sectors opined that MSC was pressured by bulk buyers of pollock to certify Russian Alaska pollock. In theory the certification would benefit bulk buyers of MSC certified pollock because of an increase in quantity supplied of MSC certified pollock with constant demand would have decreased the price of 1MSC certified pollock. One implication is that the bar was lowered for the Russian Alaska pollock certification.

The second theme concerned false statements about the Russian Alaska pollock fishery to the certification contractor. One at-sea representative and two respondents overall stated they believed the certification relied upon false documentation. For example, one complaint was that MSC final report of the Russian Sea of Okhotsk pollock states that 0 chinook were caught in the Russian Sea of Okhotsk pollock fishery in 2007, 2009, and 2010, and only 2 events of catching immature chinook occurred in 2008 (O'Boyle et al. 2013, 61, 65, 158). In contrast, weekly catch reports for 2008 show the U.S. catcher-processor fleet fishing for the midwater pollock fishery using pelagic trawl gear caught 5,602 Chinook Salmon for an average of .0325 salmon per metric ton of pollock caught across all NOAA Fishing Reporting Areas in Alaska (NOAA 2008). The discrepancy between Russian and U.S. catch of Chinook is difficult to compare because of unique ecosystems in each of the Fishing Reporting Areas and no direct mapping of U.S. EEZ ecosystems to comparable Russian EEZ ecosystems. One at-sea processor and one government respondent explicitly accused the Russian fishery of falsifying information during the MSC process. For example:

> *The Russians were asking about what report the reviewers needed, and then just fabricating that report. Another word for it is corruption. The reviewers said, "these folks are trying." Really, the buyers want this, the buyers are paying for reports, they want choice in the marketplace. (AP-08)*

The third theme was expressed by three at-sea processor association respondents and eight total respondents who stated they believed the process that resulted in the MSC certification of the Russian Alaska pollock fishery violated MSC rules and processes. A specific complaint was that the Russian Alaska pollock assessment scores had been changed in violation of MSC standard procedures. The

contractor conducting the evaluation, Moody Marine, had released a draft of the Russian Alaska pollock scoring for public comment, and received only comments that a specific score should be lowered. After the public review and comment period that score was not lowered, it was increased. The only positive change between the draft and final version was an increase of 5 points for *Section 1.2.3 Information and Monitoring* (see Appendix 3 for the preliminary and final scorecards) (O'Boyle et al. 2012, 97, 2013, 112). The At-sea Processors Association argues that the increase in score was without public documentation, and without public comment. The version of MSC scoring guidelines used in the Russian Alaska pollock certification, Version 1.3, did not include a requirement that sources of data used to increase scores be made public (MSC 2013, C123). The subsequent Version 2.0, which was released in 2014, did require documentation for changes to scoring (MSC 2014, 43).

A second variant on the theme of MSC not following internal rules concerned a separate incident between an at-sea processor who catches salmon and pollock. The U.S. company sought access to the MSC certification of sustainability of Alaskan salmon, were denied, then denied an opportunity for arbitration. As they put it:

> *MSC has rules for certificate sharing and they didn't enforce them. We were blocked when we asked for access to the certificate [held by another fishery company]. We were willing to pay [for the certification]… We were sent to mediation by MSC, then sent to arbitration. [The person with whom we were working] pulled out just before arbitration. MSC didn't enforce the rules, didn't enforce arbitration. MSC is supposed is supposed to facilitate… They have rules, and they were not following them (AP-15)*

Friction arose because the club members were expected to conform to rules of the certified management system but perceived that the club itself did not necessarily conform to rules, creating a double standard.

The fourth theme of reactions to the certification of Russian Alaska pollock fishery was the loss of exclusive on provision of MSC certified pollock. Five out of seven at-sea processors and eight out of fifteen respondents overall cited the entry of more MSC certified pollock into the market as a negative

economic impact on the U.S. Alaska pollock fishery. The at-sea processors argued that they lost any ability to differentiate between products and lost any possible price premiums that were an initial presumed benefit of MSC club membership. A point of pain was the conflation between the Russian Alaska pollock fishery, which had received very low scores during MSC certification, and the U.S. Alaska pollock fishery, which received high scores. MSC's evaluation of fishery sustainability produces scores in three primary categories: *Target Species, Ecosystem Management* and *Management System*. In the final recommendation to certify Russian Alaska pollock the MSC contractor calculated scores of 80, 80.3 and 85.1 (O'Boyle et al. 2013). Any single score below 80 results in an overall rejection. The Russian Alaska pollock fishery was above the minimum by a total of 5.4 points, and in two categories it was eminently close to failure. In contrast, during the most recent recertification of the U.S. Alaska pollock fishery the MSC contractor calculated scores of 97.5, 93, and 98.4, for a safety margin of 48.9 points, with the lowest score 13 points above the 80-point failure threshold (Chaffee et al. 2005; Bowen, Rice, and Trumble 2016). At-sea processors argued that the high-standard U.S. fishery was equated with a low-standard Russian fishery.

The four themes of reaction to the certification of pollock had subsequent impacts on the perception of MSC. Four out of seven at-sea processor and eight out of fifteen interviewees overall stated they believe MSC is a business. The MSC model has two avenues for generating revenue from certified fisheries. MSC charges an annual carrying fee for certification and a licensing fee is levied on any pollock product that carries the MSC logo. Initially the at-sea processors paid the costs of MSC certification and accepted the costs as part of doing business. Subsequently to the certification of the Russian Alaska pollock fishery the MSC was perceived to be trying to grow its business to maximize revenue from certifications. To the U.S. Alaska pollock fishery industry this represented a shift away from a focus on sustainability. The new perception was that MSC was an institution trying to expand and grow at the expense of the existing club members through licensing fees:

> *MSC is looking at changing their model. They are talking about leakage, fish that don't have the logo and don't incur the licensing revenue… They see fish that doesn't carry the logo as leakage. They want to get revenue at every stage, from landing, to processing, to resale. You want to see rabid capitalists, go hang around MSC for a while. Little non-profit making 15M British pounds per year.*[4] *(AP-08)*

Comments about the MSC business model denote a change in perception of the MSC. U.S. Alaska pollock fishery representatives offered arguments that MSC *controls access* to a market, not *provides access* to a market. The idea was that the relationship with MSC was not what the U.S. Alaska pollock fishery had expected. When asked how MSC was changing, one replied:

> *The old [MSC stakeholder] forum was 20 commercial 20 NGO, in two chambers, that met separately, then as a group. Now it will be...15 members. 5 commercial [fisheries] (2 representing small commercial [fisheries]), 5 ENGO [environmental NGO] of which 2 are from the developing world, 2 retail and food service, and 3 other. One of my big concerns is that retail and ENGO are the same. The retail take advice from ENGO. It is double coverage…We have lost our leverage in actual outcomes. The reshaping of the forum reflects that. (AP-15)*

The MSC council in 2018 consists of 17 members: 6 from "the seafood industry," 6 from "the conservation community," and 2 from the "market sector." The remaining three seats on the council are "undesignated, and used to ensure a balanced membership in the light of the MSC's strategic objectives" (MSC 2018a).

The certification of the Russian Sea of Okhotsk pollock changed the relationship between the U.S. Alaska pollock fishery and MSC. Various U.S. Alaska pollock fishery industry representatives expressed opinions that Russian Alaska pollock was certified due to MSC's desire for more revenue, and desire to control access to markets.

3 Motivations to leave MSC and join RFM

The motivations for the respondents to leave MSC range from a perception of blackmail, loss of price premiums or access to markets, and fear of arbitrary rule change by MSC. In some instances, the

[4] Review of MSC 2015-2016 financial statement shows revenue of £15.2M ($20.78M USD), of which 73% (£11.3M, $15.5M USD) came from logo licensing. See https://www.msc.org/documents/msc-brochures/annual-report-archive/annual-report-2015-16-english

reasons for leaving MSC correspond to loss of initial benefits to joining MSC. In these instances, MSC was perceived to change rules to benefit MSC at the expense of club members such as the U.S. Alaska pollock fishery.

Category	Type of Motivation	At-sea Processors		All Sectors	
		Count/7	%	Count/15	%
3. Motivations to leave MSC	Avoid MSC blackmail	5	71%	7	47%
	No longer have price premium	4	57%	6	40%
	Fear arbitrary rule changes	5	71%	9	60%

Table 5.3 Summary of findings, Section 3

The first motivation to leave MSC, expressed by five of seven at-sea processor representatives and seven of fifteen respondents overall, was due to a perceived ability of MSC to control access to markets. This was characterized alternately as "blackmail," "extortion," a "holdup" or the threat of a "black mark." Initially MSC was viewed as a club that provided certification that would meet demand from Unilever, allow benefits to club members in the form of price premiums, access to markets and protection from threats of boycott. After the certification of Russian Alaska pollock the perception of MSC changed and a new power dynamic was expressed where MSC certification was characterized as a certification used to exclude access to markets. Two at-sea respondents opined that the MSC standard was viewed independently of sustainability.

> *Overall the environmental community has been well served by dividing up the roles. Greenpeace is the threat, WWF [World Wildlife Fund, one of the founding members of MSC certification] comes in and says they can help…This is how the sustainability movement got going. This is naked extortion. (AP-15)*

> *MSC is playing a game of holdup.*[5] *You don't have access to the market if you don't have the logo. MSC wants to get that logo into as many revue streams as possible. This would naturally lower the standards. (AP-10)*

> *It is almost like blackmail if you don't get certified… The pollock fishery is the gold standard, the best in the world. [Yet] If we aren't certified, we have hard time getting in certain doors. (AP-04)*

[5] In this interview "holdup" is used in the sense of "holding up" a bank with a pistol during a robbery.

One at-sea processor summarized the power of MSC in a vignette where MSC was perceived to try to block the National Park Service from salmon from Alaska because it did not carry the MSC certification.

> *MSC got the National Park Service in Alaska to not buy Alaska salmon unless it was MSC certified. [That is] the strength that MSC has over our business by some multi-standard business certification that was sold to us to be a uniform-standard... (AP-14)*

In 2013 the Alaska salmon industry attempted to drop MSC certification of its salmon and instead rely upon branding with the terms "wild caught" and "Alaska." Walmart, the National Park Service and a food service company with contracts to supply the U.S. military subsequently threatened to stop buying salmon. Alaska Senator Begich convened a hearing on the topic and Alaska Senator Murkowski introduced a bill to prohibit federal agencies from requiring seafood to be certified by any third-party (Jolly 2013).

The second theme for leaving MSC, given by four of seven at-sea processor representatives and six of fifteen respondents overall, was the loss of a price premium, or lack of a price premium. The lack of a price premium was due to buyers accepting certifications other than MSC, or not requiring a certification of sustainability. The acceptance of alternative certifications may partially be due to the proliferation of alternative certifications of sustainable fisheries, not necessarily a differentiation between the standards for sustainability.

> *Most buyers today say MSC or equivalent. MSC has the broadest general acceptance. (AP-08)*

> *There is a plethora of these standards. What criteria do you use? The consumer is so confused they don't know what to believe. The people that put fish in boxes say our boxes are getting cluttered by all these scribbles. (AP-04)*

Another approach taken by one at-sea processors was to argue that the MSC certification is not the appropriate measure of sustainability:

> *Some [bulk] customers choose to understand more than MSC, and the responsibility [to sustainable fisheries]. Often a customer will say "Is this sustainable?" and they don't know what*

> *that means. I tell them the species, and the management regime that makes it sustainable, not the certification program. (AP-15)*

The idea that buyers treat two different certifications with equivalence may be seen as an opportunity for the U.S. Alaska pollock industry. The at-sea processors, along with the state of Alaska and ASMI, encouraged buyers to equate U.S. fisheries, and specifically Alaska fisheries,[6] with sustainability. The effort is to disconnect third-party certifications with sustainability, and instead use management standards under the Magnuson Stevens Act, or the brand cachet of "Alaska" to connote sustainability.

The third motivation to leave MSC was the fear of arbitrary changes to MSC rules which was cited by five of seven at-sea processor association representatives and nine of fifteen respondents overall. The admittance of the Russian Alaska pollock fishery was cited as arbitrary and cause of increased uncertainty that MSC would abide by current practices. The U.S. Alaska pollock fishery representatives assessed the motivations of MSC were to promote the institution of MSC, not create benefits for U.S. Alaska pollock fishery. The MSC was seen as acting to capture benefits for the club owners, not the club members. As one respondent summarized:

> *The MSC system is broken. They promise a premium. They are selling the logo, they use the logo as a tool to retailers. Retailers benefits from cheaper product [due to more fisheries being certified]. MSC is investing in the future in co-branding and marketing efforts with retail, and retail is pressing to get more fisheries certified. MSC has abandoned the relationship with harvester and fishery clients (AP-15)*

The U.S. Alaska pollock fishery faces a dilemma. It was one of the first fisheries to join MCS and it believes it adheres to a higher standard of sustainability than other fisheries. If MSC is to continue to grow, then fisheries with lower standards of sustainability will receive MSC certification. In a binary measure a low-pass fishery would command the response as a high-pass fishery. The U.S. Alaska pollock

[6] This respondent uses "Alaskan fisheries" to signify all seafood products caught in Alaskan waters. Another term used is United Nations Food and Agriculture (FAO) Area 67, which encompasses the U.S. portion of the Bering Sea, Aleutian Islands and Gulf of Alaska. The U.S. Alaska pollock fishery is working to develop branding of "Area 67" as a way of asserting sustainability that does not rely upon MSC. This branding would stand alone and not rely upon FAO or RFM standards.

fishery believes itself to be a high-pass fishery equated with the low-pass Russian Alaska pollock fishery. From the perspective of the U.S. Alaska pollock fishery it is now punished for MSC certification because its high-pass sustainability is treated equally with the Russian low-pass. Additionally, by starting with a high-pass fishery the MSC has nowhere to go but down:

> *How do you [MSC] expand your business and keep standards? You can't. MSC can't control the entire globe of fisheries. MSC has lost control. They have watered down. They have tried to expand. They are diluting [their standards]… To expand you have to lower the standard. (AP-06)*

The mistrust of MSC to adhere to current standards for admittance was paired with fear that MSC would create new standards unrelated to sustainable fisheries. A second fear that MSC would create costly new standards that the U.S. Alaska pollock industry would be forced to meet, including labor constraints:

> *There is a scheme trying to add things that have nothing to do with the health of the stock. Such as MSC attempt to add labor practices. You can only imagine the trepidation we have… There is a vernacular for sustainable, but it was always to be biological sustainability. (AP-10)*

The certification of the Russian Alaska pollock fishery inverted the power dynamic from an equilibrium where U.S. Alaska pollock fishery chose to participate, to an equilibrium where U.S. Alaska pollock fishery felt compelled to participate. In the new equilibrium MSC could change rules to benefit the institution of MSC, not the members of MSC club for responsible fishing practices. The U.S. Alaska pollock fishery was catalyzed by the certification of Russian Alaska pollock and motivated to leave or seek alternatives to MSC to avoid "blackmail," or changes to rules. The U.S. Alaska pollock industry began to evaluate Responsible Fishery Management (RFM) as an alternative club in the same issue space.

4. Motivations to Join RFM

The Russian Alaska pollock fishery began its MSC certification process in September 2008 and was fully certified on September 24th, 2013 (Tavel Certification 2008; O'Boyle et al. 2013). The U.S. Alaska pollock

industry did not wait for final MSC certification to respond. In April 2010 the U.S. Alaska pollock industry applied for the Responsible Managed Fisheries certification and received the certification on December 6th, 2011 (Global Trust 2011). Since 2011 the U.S. Alaska pollock fishery has carried two certifications in the same issue space. The reasons given to join RFM were to get access to markets that demanded certification of sustainability but not a particular certification of sustainability, e.g. MSC; to provide a check on the ability of MSC to continue to grow and influence the standards for sustainability; and to block arbitrary rule changes by MSC.

Category	Type of Motivation	At-sea Processors		All Sectors	
		Count/7	%	Count/15	%
4. Motivations to join RFM	Access to markets	3	43%	7	47%
	Provide checks and balances to MSC	4	57%	6	40%
	Block arbitrary rule change by MSC	2	29%	2	13%

Table 5.4 Summary of findings, Section 4

Three of seven at-sea processor representatives and seven of fifteen respondents overall cited access to the European market as a motivation to seek RFM certification. Respondents articulated that RFM was a plan to supplant the gatekeeper status of MSC the European market, especially the German market.

> *Alaska pollock is the number one fish eaten in Germany, and that [MSC control to the market] is what you have to break. If RFM is a viable, vigorous program, you break that one knot. Other than that, MSC doesn't have a lot... That is the market knot that we need to break—if RFM is credible. I don't know if it we will get there, because I don't know if there are people in the industry that are going to take a 15-year view. And that is what it will take… (AP-08)*

U.S. Alaska pollock fishery representatives identified the need for staff, marketing and even education programs on RFM in Europe to compete with MSC. Marketing efforts were seen as important in part because MSC has been certifying pollock for Europe for thirteen years. Additionally, MSC was characterized as an outside group that sought to capture benefits for itself, whereas RFM was characterized as member of the Alaskan community that was created to keep benefits within the community. At least two at-sea processors representatives used the possessive pronoun "we" when

describing actions or strategy taken by RFM. In some cases, the control over RFM was made more explicit:

> *RFM is an alternative to MSC that Alaskans control. RFM is controlled by Jim Gilmore,*[7] *Ron Rogness,*[8] *[and] Glenn Reed.*[9] *It was set up as an alternative to MSC. Drive down costs. (CN-12)*

Seeking RFM certification was perceived as a way to grant the U.S. Alaska pollock fishery more control over the club rules to define sustainable fisheries. If RFM could also enable access to the European market, then the additional certification by MSC would be less imperative.

The second motivation to join RMF was to provide checks and balances to MSC. Four of seven at-sea processors respondents, and six of fifteen respondents overall identified ways RFM could act as a check on the ability of MSC to dictate terms.

> *[Why did you get RFM?] As an alternative to MSC. As a check and balance to MSC. To maintain a GSSI alternative.*[10] *To maintain integrity and honesty, and more purely intended to be sustainable, biologically managed, aligned with the FAO standard,*[11] *not going afield with labor. (AP-10)*

> *There has to be a check and balance with third-party certification parties. But, there has to be the marketing to become a certification market place leader, [along] with MSC. (AP-14)*

The check on the power of MSC was contrasted with an earlier effort by Alaska salmon to sell directly to Walmart with a RFM certification and without a MSC certification. Walmart's previous policy had been to only sell MSC certified salmon.

> *[Alaska salmon fishery representatives had approached Walmart to sell RFM certified sustainable Alaska salmon] MSC was threatening to boycott Walmart if they sold RFM and not MSC. Those of us in pollock saw what the extortion would look like and we though that we should have an alternative. (AP-14)*

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[7] Director of Public Affairs at At-sea Processors Association
[8] Vice President Corporate Relations at American Seafoods Group, member of At-sea Processors Association
[9] President at Pacific Seafoods Processors Association
[10] Global Sustainable Seafood Initiative (GSSI) is a Dutch organization that is attempting to be a reviewer of certifications for sustainable seafood. The RFM model is recognized GSSI.
[11] The RFM model uses FAO standards for biological sustainability of a fishery.

This example may have resonated with the U.S. Alaska pollock industry due to their experiences with a Greenpeace boycott from 1996 to 1998. It is also an example of the gatekeeping power of MSC.

The third motivation to for joining RFM was to mitigate potential efforts by MSC to compel compliance to objectionable regulations. This motivation was cited by two of seven representatives of the at-sea processors. The at-sea processor referred to RFM alternately as "insurance" against outrageous costs, or as way to prevent standards unrelated to biological sustainability of the fishery.

> *We needed something so they [MSC] can't start demanding outrageous things, like 400 observers on boats. How do you control that? Have competition for certifications. We have had huge debates about supporting RMF. Do we want to spend another $500K to support RMF? (AP-06)*

The at-sea processor respondent identifies a market for certifications. The choice set faced by the U.S. Alaska pollock industry includes choice between competing clubs for sustainability, or membership with RFM and continued support of RFM which is seen as a sympathetic club where the U.S. Alaska pollock industry would enjoy more influence in rule making.

> *That is why we want ASMI RFM… Iceland has a RFM model and for the same reasons, they want choice. They don't want to be in a position where we have to change our fishery management in response to a change in an uninformed forum in London [MSC headquarters are in London]. If they [MSC] ever get way off the rail, then we have an option. The RFM is us getting insurance. They [MSC] are expanding their footprint and they know they can't get more fisheries and thus lower standards and keep us. (AP-15)*

The final quote is remarkable. The at-sea processor echoes the idea that U.S. Alaska pollock fishery want to choose from a marketplace of third-party certifications. The at-sea processor then explicitly states that they are searching for a sustainability club, or considering helping to create a club, that will not require "uninformed" changes to their existing practices. In the same quote the respondent identifies a challenge to MSC that has carried through these findings: how will MSC continue to grow and retain high standards? The largest food fishery in the world, the Alaska pollock fishery in both U.S. and Russian waters, is already MSC certified. MSC does not have a choice set that includes larger and higher quality

fisheries. The only place to go to expand coverage appears to be to lower certification standards, and the U.S. Alaska pollock industry does not want to be indistinguishable from inferiorly managed fisheries.

In summary, the motivation to join RFM reflects the initial benefits that U.S. Alaska pollock fishery saw in MSC. The U.S. Alaska pollock fishery hopes that RFM will allow them access to markets that demand certification of sustainability, including Europe, especially Germany, Walmart and McDonald's. The U.S. Alaska pollock fishery also wishes to be free from threats of boycotts and arbitrary risk to its business. Ironically the threat of boycott now originates from MSC which was originally a shield against boycotts. Certification by RFM also offers insurance against expansion by MSC into issue-spaces not related to biological sustainability of fisheries such as labor practices or costly additional monitoring. A strong RFM scheme offers the security of alternatives and a way to escape MSC demands. If RFM is accepted by customers and U.S. Alaska pollock fishery can influence or control RFM policies, then the U.S. Alaska pollock industry will have successfully identified club owner benefits, joined a rival club in the same space without losing MSC club benefits and may be able to capture club owner benefits such as controlling membership and setting standards.

Market Changes

The market for pollock is dynamic and a change relevant to this case study occurred recently. Walmart originally made a commitment in 2011 that all seafood sold at Walmart have "one of the following: Marine Stewardship Council (MSC), Best Aquaculture Practices (BAP) *or equivalent standards* [emphasis added]" (Walmart 2011, 30). On February 17th, 2017 Walmart updated their policy regarding third-party certification of sustainable seafood to read:

> By 2025, based on price, availability, quality, customer demand, and unique regulatory environments… [details of specific branches of the company omitted] Walmart will require all fresh and frozen, farmed and wild seafood suppliers to source from fisheries who are: Third-party *certified as sustainable using Marine Stewardship Council (MSC) or Best Aquaculture Practices (BAP), or certified by a program which follows the FAO Guidelines and is recognized by*

> *the Global Sustainable Seafood Initiative (GSSI) as such*. [emphasis added] (Walmart 2018, Seafood Policy, Section IV)

The Global Sustainable Seafood Initiative (GSSI) is a non-profit consisting of members of the seafood supply chain, NGOs, governmental and intergovernmental organizations and intendent experts. GSSI certifies that other third-party certifications meet GSSI standards (GSSI 2018). The GSSI standards are based on FAO standards. As of 2018 GSSI recognizes MSC, RFM, Iceland Responsible Fisheries Management (IRFM) and Best Aquaculture Practices (BAP). The updated Walmart policy suggests RFM certified products such as the U.S. Alaska pollock fishery meet Walmart's commitment to sustainable seafood and may be sold at Walmart exclusive of MSC certification.

Conclusions

I developed two testable hypotheses for this research. The first hypothesis tests club member agency when club members observe differences between benefits to club owners and club members.

> **H1: Club members act to create new clubs or join new clubs in the same issue space when they perceive benefits to owners exceed benefits to club members.**

The second hypothesis is a test of the ability of club members to switch or create clubs.

> **H2: Club members who are members of privileged groups can create or join additional clubs in the same issue space.**

Findings for Hypothesis One

The first hypothesis requires understanding the perceptions of benefits by the club member, U.S. Alaska pollock fishery via the At-sea Processors Association, and their perceptions of the club owner, MSC. This hypothesis explores a component of excludability of clubs, the motivation to switch clubs or create clubs. This case study shows that the club member did perceive club owner benefits, was motivated by discrepancies between owner and member benefits and was motivated to seek, or create, a new club in

the same issue. This case study finds evidence to address hypothesis one with findings of differences in benefits in four independent ways: 1) control of member admittance; 2) control of standards for membership; 3) perceptions of rule-breaking and; 4) defining levels of credence attributes. This hypothesis explores the ability of competing clubs to provide benefits to club members and how these benefits affect the motivation of club members to switch clubs or create clubs. Each of these four findings are summarized below.

The first category of findings concerns control of membership rules. A frequently cited point of conflict between MSC and U.S. Alaska pollock fishery was the decision by MSC to admit Russian Alaska pollock into the MSC club for sustainability. Admittance of Russian Alaska pollock demonstrated the asymmetry of club owner control of membership. The U.S. Alaska pollock industry representatives stated their belief that MSC admitted Russian Alaska pollock to benefit MSC, the club owner, to the detriment of U.S. Alaska pollock fishery, the club member. As a result, the perception of MSC by U.S. Alaska pollock fishery fundamentally shifted from a relationship of cooperation between to a competition between two rivals, with MSC controlling the rules and acting to accrue benefits for the MSC institution. Benefits to MSC could include additional revenue through logo licensing royalties, reputational benefits for a larger share of the global wild catch of seafood, and possible additional power to dictate terms with a larger share of the global catch reliant upon the MSC certification for access to markets. Another instance is the perceived plasticity of membership standards. The U.S. Alaska pollock industry cited specific concerns about the admittance of the Russian Alaska pollock fishery that, while not attempted to be validated by this research, were stated as motivation for U.S. Alaska pollock fishery to leave MSC and join RFM. The U.S. Alaska pollock industry suspected MSC lowered the bar for Russian certification or applied different standards during the certification of U.S. Alaska pollock fishery than Russian Alaska pollock. The U.S. Alaska pollock fishery representatives opined that bulk buyers of pollock pressured MSC into admitting Russian Alaska pollock and MSC succumbed to economic pressure to admit the Russian Alaska pollock

fishery. The U.S. Alaska pollock fishery respondents also argued that MSC accepted Russian documentation that would not have been accepted from U.S. fisheries. Specifically, the U.S. Alaska pollock fishery questioned the level of bycatch of chinook salmon by Russian Alaska pollock fisheries, which was reported as zero for three of the four years reviewed. The control of membership and perceived inconsistency in standards were motivations for U.S. Alaska pollock fishery to seek RFM certification.

The second category of findings relevant to hypothesis one concerns the club owner control of issue space. The U.S. Alaska pollock fishery respondents articulated their fear MSC would expand from a certifier of biological sustainability to include labor practices. The U.S. Alaska pollock fishery representatives expressed their opinion that MSC should limit rules to biological standards for sustainability.

The third category of finding relevant to hypothesis one concerns adherence to club rules. Specific complaints by U.S. Alaska pollock fishery representatives concern documentation of evidence supporting a change of Russian Alaska pollock certification scores, enforcement of certification sharing and enforcement of mandatory arbitration. At-sea processors were particularly outraged by an increase of the Russian certification score they believe allowed the fishery to meet MSC standards after public comment and review that challenged the ratings from the original draft. The U.S. Alaska pollock fishery was further frustrated by a modification of MSC rules to prohibit a similar change in the future without documentation. In some ways they saw this change as a recognition of the lack of transparency in the Russian process and confirming that changes in the evaluation were not properly vetted.

The fourth category of finding relevant to hypothesis one concerns MSC's ability to conflate two heterogeneous credence goods. MSC's evaluation of fishery sustainability produces scores in three primary categories: *Target Species, Ecosystem Management* and *Management System*. In the final

recommendation to certify Russian Alaska pollock the MSC contractor calculated scores of 80, 80.3 and 85.1. Any single score below 80 results in a rejection. The Russian Alaska pollock fishery was above the minimum by a total of 5.4 points, and in two categories it was eminently close to failure. In contrast, during the most recent recertification of the U.S. Alaska pollock fishery the MSC contractor calculated scores of 97.5, 93, and 98.4, for a safety margin of 48.9 points, with the lowest score 13 points above the 80-point failure threshold. These two fisheries are treated equally in the binary metric of MSC certification.

In summary, this research found evidence to support the hypothesis that club members have insight into club owner benefits and choose to join, or create new clubs, in the same issue space when benefits to club owners exceed benefits to club members. I found compelling evidence the U.S. Alaska pollock fishery had detailed insights into the choices made by MSC to benefit MSC in a manner perceived to be at the expense of U.S. Alaska pollock fishery, was motivated by lost opportunities for club member benefits and sought to join an alternative club in the same issue space to capture those benefits. This research does not offer any compelling evidence on the relative quantity of benefits and therefore cannot address the relative term "exceed" in the hypothesis.

Findings for Hypothesis Two

The second hypothesis requires establishing if U.S. Alaska pollock fishery is a privileged group and created or joined a club in the same issue space. This hypothesis explores a second component of benefits of club membership and the capacity to switch clubs or create clubs.

> **H2: Club members who are members of privileged groups can create or join additional clubs in the same issue space.**

The test of hypothesis two is to show that the at-sea processors are members of privileged groups and can create or join a club in the same issue space.

Olson defines privileged members of groups as possessing an incentive to provide all the collective good even if they must pay the full cost of provision. The At-sea Processors Association neatly fits this description having paid the RFM initial costs and the MSC and RFM ongoing costs and having extended the certification to the other sectors of the U.S. Alaska pollock fishery. The other two variables of Olson's typology are the size of the group and the type of good. The U.S. Alaska pollock fishery matches the description of a small group where social and economic impacts made by members may be observed by other members. If one were to define the group as catchers of certified Alaska pollock, then the group would include both the certified U.S. Alaska pollock fishery and the certified Russian Alaska pollock fishery. The group is still defined as small; the Russian Alaska pollock fishery has an economic impact on the U.S. Alaska pollock fishery and vice versa. Finally, the certified pollock fishery is bounded in quantity demanded so increases in supply decrease price commanded. The certified pollock industry is therefore an exclusive good. Table 9 situates the U.S. Alaska pollock fishery in Olson's typology.

Size of Group:		Large		Small		Federalized	
Type of Good:		Exclusive	Inclusive	Exclusive	Inclusive	Exclusive	Inclusive
Type of Group:	Privileged			**Pollock**			
	Latent						
	Intermediate						

Table 9 U.S. Alaska pollock fishery situated in the Olson group typology

The second component of hypothesis two concerns club member agency in joining or forming a new club in the same issue space. The at-sea processors joined RMF and clearly simultaneously hold two certifications in the same issue space of sustainable fisheries. The higher standard, not met by this research, would be to show that the at-sea processors had created a new club in the same issue space to capture benefits to club owners. In interviews at-sea processors describe RFM using the inclusive pronoun, describe how the at-sea processors wish to shape RFM, describe desired marketing efforts and allude to internal at-sea processor debates on an additional $500K expenditure to expand RFM. None of these statements rise to the level of club ownership but they are more than club membership.

This research finds evidence to support hypothesis two. The at-sea processors, the holders of the MSC certification, have significant resources at their disposal, are members of a privileged group, and did join a rival club in the same issue space.

Contribution

Environmental policy theory identifies voluntary clubs with environmental standards as a possible market-based solution that offers a low-cost policy tool to align incentives to produce environmental policy objectives. Environmental clubs are used to overcome information asymmetries about credence attributes related to methods of production. Members of the club signal consumers that their products have environmental credence attributes by inclusion of a club certification on products. In a successful use of clubs for environmental practices consumers express preferences for environmental outcomes by buying products bearing club certifications of membership. Producers who are club members command a price premium or have greater market share, and policy makers incur low costs for environmental stewardship. Everybody wins. The existing theory rests upon two assumptions: clubs are both non-subtractable and excludable. This research extends club theory by focusing on competition among clubs.

In this case study I trace the motivations of U.S. Alaska pollock fishery industry, a club member of the environmental club MSC, to join or create a rival club in the same issues space and be treated equally by consumers. I have shown U.S. Alaska pollock fishery had institutional capacity and clear understanding of the benefits of club ownership relative to club membership. I have shown U.S. Alaska pollock fishery evaluated the costs and benefits of joining a rival club then sought and received certification from RFM, a rival club in the same issue space, when conditions favored shifting clubs. I have shown that U.S. Alaska pollock fishery representatives know RFM is accepted as an equivalent certification to MSC in some markets and use this fact to update their motivations to remain in MSC or seek alternative club membership.

Competition among clubs in a single market has substantial implications for the ability of clubs to achieve conservation objectives, because firms may have less incentive to improve their conservation practices, which may lead to outcomes similar to common pool resources. In this construction entrepreneurs will enter the market for clubs (i.e. create novel clubs in the same issue space) until marginal costs of creating new clubs equals marginal benefits. In this case a possible outcome is that customers would not differentiate between clubs and instead treat all clubs generically. In practice this would be an indifference to which club has certified a club member good. The information conveyed by club membership would lose value. In the case of third-party certifications of sustainable fisheries, one could imagine a customer asking for "MSC certified, *or equivalent*" or even "a product with *any* certification of sustainability."

In this case there may be free entry into the market for clubs until the marginal cost of creating a club equals the marginal benefit with no guarantee the aggregate number of clubs will be socially optimal. Consumers may not differentiate between clubs and a tragedy of overproduction of clubs may occur. In such a case the market mechanism theorized to achieve a win-win-win outcome may not hold. Instead of win-win-win outcomes a certification may have diminished impact on production practices as the number of certifications increases. Without the market force rewarding production practices the resource will be increasingly harvested as it would have been prior to the use of clubs. In such a scenario the number of clubs is overproduced to the point that consumers cannot differentiate between clubs, cannot express preference for environmentally sound production models, and responsible producers are rewarded neither by higher prices, nor greater market share; this could be characterized as a lose-lose-lose outcome. In some instances, the resource may return to a tragedy of the commons.

Caveats

Two important caveats apply. First, the U.S. Alaska pollock fishery has not entirely abandoned MSC. In 2018 U.S. Alaska pollock fishery holds third-party certifications for sustainable fisheries from both MSC and RFM. I have shown that U.S. Alaska pollock fishery is motivated to leave MSC and has joined a competitor club in the same issue space. I have shown that U.S. Alaska pollock fishery is working to "break the knot" of MSC influence in Germany. Second, the market has not fully accepted RFM as a substitute for MSC. Walmart has accepted RFM and U.S. Alaska pollock fishery representatives state that customers request "MSC or equivalent" certifications. Others important customers have not yet accepted RFM as a complete substitute.

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Appendix 1: Semi-structured Interview Questions

Hello, my name is Tyler Davis, and I am a graduate student at the University of Washington. I am conducting research on how the seafood industry chooses to participate, or not participate, in different types of voluntary certifications. My email address is tbdavis@uw.edu.

I would like to interview you about how you, or your industry, evaluate membership in certifications. This will take around 20 minutes and I will not collect any personal information that can be linked back to you. Your responses will be aggregated with responses of others so your name will not be directly linked with your responses. Your responses are voluntary. May I interview you? _____

Thank you. The questions are designed to help me understand how thinks about the costs and benefits of certifications for sustainable seafood. I'm researching how industry evaluates the types of certifications available.

Today, I'm going to ask you how you think about the costs and benefits for seafood certifications, and then I'll for your opinion on how you think the industry evaluates costs and benefits.

Survey Number _____
Location _____

Background

Fishery

What do you do in this fishery, and how long have you been doing it?

Background on Certifications

Are you aware of any certifications of sustainable seafood?

Are you aware of Marine Stewardship Council (MSC) certification and Alaska Seafood Marketing Institute (ASMI) Responsibly Managed Fishery (RFM) certifications? What do you think of them?

Joining a Club: Benefits and Costs

Benefits

What are the benefits to an individual like you of getting a certification for sustainable seafood such as MSC or RFM certifications?

Which of these benefits is most important to you?

If you were to put these into a percentage, even if it is just a rough estimate, how would you break down the distribution of benefits to certification?

Would anything be different if you were to think of the benefits from the perspective of the whole fishery, instead of from the perspective of an individual such as yourself?

Thinking of just the benefits, can you contrast the benefits of getting Marine Stewardship Council (MSC) certification and Alaska Seafood (RFM) certification?

Costs

What are the costs or drawbacks to an individual like you of joining these certification in general?

If you were to put these into a percentage, even if it is just a rough estimate, how would you break down the costs and drawbacks to certification?

Is there a way that MSC or RFM differs?

Would anything be different if you were to think of the benefits from the perspective of the whole fishery, instead the perspective of an individual, such as yourself?

Thinking of just the costs, can you contrast the costs or drawbacks of getting Marine Stewardship Council (MSC) certification and Alaska Seafood (RFM) certification?

Switching Certifications

The Alaska Pollock fishery was certified by the Alaska Seafood Marketing Institute (RFM) as a sustainably harvested seafood, using the Food and Agriculture Organization (FAO) standards. This is in addition to the 2010 certification of Pollock by MSC. Why do you think the fishery switched certifications, or choose to get both certifications?

Making Changes

If you could make a change to either MSC or ASMI certifications, what would you change?

Appendix 2: Responses on each theme by each sector

The number of individual interviews for each sector is included in parenthesis in the column header.

Category of Finding	Type of Motivation	All Sectors Count (15)	At-sea Processors Count (7)	Catcher Vessels Count (4)	Consultants Count (2)	Government Count (2)
Initial benefits	Profit	11	5	3	1	2
	Customer demand / Protection from Greenpeace	9	6	1	1	1
	Access to Markets	12	6	2	2	2
Initial costs	Monetary costs were trivial	10	5	3	1	1
	Staff time	4	3	0	1	0
Reaction to Russian certification	Collusion between MSC and large buyers	5	3	1	0	1
	False assertions by Russian fishery	2	1	0	0	1
	MSC breaking its own rules	8	3	2	2	1
	U.S. pollock is no longer unique	8	5	1	0	2
Subsequent Perceptions of MSC	MSC is a business	8	4	0	2	2
	MSC competes with U.S. pollock for benefits	2	1	0	0	1
Motivations to leave MSC	Avoid MSC blackmail	7	5	1	1	0
	Loss of price premiums	6	4	1	1	0
	Fear arbitrary rule changes	9	5	2	1	1
Motivations to join RFM	Access to Markets	7	3	1	2	1
	Provide checks and balances to MSC	6	4	0	1	1
	Block arbitrary rule change by MSC	2	2	0	0	0

Appendix 3: Detailed Scorecards from MSC certification

Draft scores of Russian Alaska pollock fishery certification by MSC (2012)

Prin-ciple	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Score
One	1	Outcome	0.5	1.1.1	Stock status	90
				1.1.2	Reference points	90
				1.1.3	Stock rebuilding	
		Management	0.5	1.2.1	Harvest strategy	70
				1.2.2	Harvest control rules & tools	80
				1.2.3	Information & monitoring	70
				1.2.4	Assessment of stock status	75
Two	1	Retained species	0.2	2.1.1	Outcome	80
				2.1.2	Management	85
				2.1.3	Information	80
		Bycatch species	0.2	2.2.1	Outcome	80
				2.2.2	Management	85
				2.2.3	Information	75
		ETP species	0.2	2.3.1	Outcome	80
				2.3.2	Management	80
				2.3.3	Information	70
		Habitats	0.2	2.4.1	Outcome	80
				2.4.2	Management	95
				2.4.3	Information	95
		Ecosystem	0.2	2.5.1	Outcome	85
				2.5.2	Management	80
				2.5.3	Information	75
Three	1	Governance and policy	0.5	3.1.1	Legal & customary framework	90
				3.1.2	Consultation, roles & responsibilities	95
				3.1.3	Long term objectives	100
				3.1.4	Incentives for sustainable fishing	80
		Fishery specific management system	0.5	3.2.1	Fishery specific objectives	85
				3.2.2	Decision making processes	75
				3.2.3	Compliance & enforcement	85
				3.2.4	Research plan	80
				3.2.5	Management performance evaluation	70

Final scores of Russian Alaska pollock fishery certification by MSC (2013)

Prin-ciple	Wt (L1)	Component	Wt (L2)	PI No.	Performance Indicator (PI)	Score
One	1	Outcome	0.5	1.1.1	Stock status	90
				1.1.2	Reference points	80
				1.1.3	Stock rebuilding	
		Management	0.5	1.2.1	Harvest strategy	70
				1.2.2	Harvest control rules & tools	80
				1.2.3	Information & monitoring	75
				1.2.4	Assessment of stock status	75
Two	1	Retained species	0.2	2.1.1	Outcome	80
				2.1.2	Management	85
				2.1.3	Information	80
		Bycatch species	0.2	2.2.1	Outcome	80
				2.2.2	Management	85
				2.2.3	Information	75
		ETP species	0.2	2.3.1	Outcome	80
				2.3.2	Management	80
				2.3.3	Information	70
		Habitats	0.2	2.4.1	Outcome	80
				2.4.2	Management	85
				2.4.3	Information	85
		Ecosystem	0.2	2.5.1	Outcome	85
				2.5.2	Management	80
				2.5.3	Information	75
Three	1	Governance and policy	0.5	3.1.1	Legal & customary framework	90
				3.1.2	Consultation, roles & responsibilities	95
				3.1.3	Long term objectives	100
				3.1.4	Incentives for sustainable fishing	80
		Fishery specific management system	0.5	3.2.1	Fishery specific objectives	85
				3.2.2	Decision making processes	75
				3.2.3	Compliance & enforcement	85
				3.2.4	Research plan	80
				3.2.5	Management performance evaluation	70

Chapter 3

Crowded Markets: The Effect of Additional Clubs for Sustainability on Benefits to Membership of Existing Clubs

Abstract

Goods bearing third-party certifications of environmentally responsible production are examples of using club goods to enable consumers to express preferences for environmental standards and help to realize public policy objectives of environmental policy. Clubs may be fourth-party when the standards for membership are set by the government, or third-party when the standards for membership are set by an outside group. Clubs that grant third-party certifications of goods for sustainability characteristics may be a low-cost option to realize policy objectives because certification may align incentives enabling producers and customers to interact with little government expense. In this construction customers express preferences for products produced using environmentally sustainable methods, responsible firms capture price premiums or market share for additional profits unavailable to non-certified competitors and third-party clubs establish standards of production that reduce negative environmental impacts. However, if any part of this causal chain fails, then the market-based tool may not produce the desired environmental outcomes. The Marine Stewardship Council (MSC) has emerged as a leading club that grants third-party certification for fisheries practices and is often cited as a successful example of a club good aligning incentives to promote sustainable fisheries. A growing body of literature using survey and market-based data has shown consumer preferences for MSC certified goods or other certified sustainable seafood products. However, since the first certification by MSC in 2000 many alternative clubs have entered the market and offer alternative third-party certification of sustainable fishing practices. No research to date has tested the perseverance of MSC price premiums or market share in the face of additional alternative certifications for responsible fisheries. This research is the first attempt to test the impact of varying the number of competing fisheries certifications on benefits to MSC certified goods. This research uses an online stated preference survey (n=610) to test the impact of additional certifications on market share and willingness to pay a 5% premium for MSC certified goods. This research finds evidence of decreases in market share for MSC certified goods at the same price, and at a 5% price premium as a function of additional certified sustainable fisheries goods entering the market. This case study may suggest that benefits to firms in voluntary clubs for environmental practices may lose benefits when there is market entry to the same issue-space. The diluting of benefits to firms in existing clubs may diminish one motivation for firms to remain in voluntarily remain in clubs for environmental practices.

1. Introduction

Past and current fisheries practices have depleted worldwide wild fish stocks and require concerted effort to rebuild fisheries resources (Pauly et al. 2002; Worm et al. 2006, 2009). One approach to creating more sustainable fisheries management has been the use of clubs to grant third-party

certification of environmental standards of fishing. The definition of a club good is a good which is excludable and non-rivalrous (Samuelson 1954; Ostrom 1990; Prakash 2001; Prakash and Potoski 2006). The club good is excludable because club members can prevent non-members from capturing club benefits. The club good is non-rivalrous because the benefits of one club member do not subtract from the benefits of another club member.

	Excludable	**Non-excludable**
Rivalrous	**Private Goods** Food, clothing, housing	**Common Pool Resources** Fish stocks, grazing lands, timber
Non-rivalrous	**Club Goods** Private parks, cinemas, certifications	**Public Goods** Clean air, national defense

Table 1 Typology of goods

Clubs granting third-party certification of sustainable fishing practices use market-based solutions that incur low costs to government, enable environmentally responsible firms to make additional profits, enable customers to express their preferences for sustainable products and produce positive environmental changes (Roheim 2003; Gudmundsson and Wessells 2000). The use of clubs to produce third-party certification relies upon creating benefits to club members. Benefits may come in the form of reputation or customers choosing third-party certified products over non-certified products, which often means demonstrating willingness to pay a non-trivial price premium for third-party certified products to incentivize producers to join or maintain sustainability certification and adhere to responsible fishing standards (Gudmundsson and Wessells 2000; Prakash and Potoski 2006; Gugerty and Prakash 2010).

The monetary linkage between consumer behavior and producer fishing practices rely upon price premiums or market share between capture, wholesale, and end customers. Linkages between capture of fish by a firm and wholesale actors have been tested using survey data and landings data. The results are mixed; Chang (2012) finds a price premium at the wholesale level using landing data, Lajus (forthcoming) finds between 0% and 20% self-reported premium using survey data, and others find no

change in price premium. (Wakamatsu 2014; Blomquist, Bartolino, and Waldo 2015; Stemle, Uchida, and Roheim 2016; Chang 2012; Lajus, Stogova, and Keskitalo 2018). Additional empirical research assesses price premiums between wholesales and customers for individual certifications, including MSC (Roheim, Asche, and Santos 2011; Fonner and Sylvia 2015; Jaffry et al. 2016; Bronnmann and Asche 2016; Blomquist, Bartolino, and Waldo 2015). Since the creation of the Marine Stewardship Council (MSC) certification of sustainable seafood in 1996 over 30 additional third-party standards of sustainable seafood have entered the market (MSC 2018; Parkes et al. 2010). No research has empirically tested the impact of additional certifications on the ability of MSC to continue to capture price premiums and market share and thus continue to support the alignment of incentives from producers to consumers. Consumers may treat third-party certified goods in the same issue-space as perfect substitutes despite any real or perceived differences in club standards.

If additional third-party certifications of sustainability compete away the benefits of any one specific certification to a producer, then the linkage between consumer behavior and fishery firm may be diminished. Club members may still retain reputational benefits, but the monetary benefits would be diminished. The club itself is remains excludable and non-subtractable. However, if club membership incurs costs to firms but does not prevent non-members taking benefits thought to be exclusive to club members, then the benefits of club membership are subtractable. Outcomes of these goods in the market may more closely resemble private goods or common pool resources. Of the two, common pool resources present a policy challenge because aggregate private consumption exceeds socially optimal consumption (Hardin 1968; Ostrom 1990).

	Excludable	Non-excludable
Subtractable	**Private Goods** Food, clothing, housing	**Common Pool Resources** Fish stocks, grazing lands, timber
Non-subtractable	**Club Goods** Private parks, cinemas, certifications	**Public Goods** Clean air, national defense, lighthouse

Table 2 Two possible outcomes when benefits to club membership become subtractable

The purpose of this research is to test if market entry to create additional certifications subtract benefits to MSC certification of sustainability and threaten the anticipated functioning of a market-based tool for promoting sustainable seafood production.

This paper is organized as follows. Section 2 is background on the rationale for third-party certification. Section 3 is a summary of existing empirical findings linking consumer preference to price premiums and market share for third-party certified sustainable fisheries. Section 4 is an introduction of the survey instrument. Section 5 is a summary of the survey data. Section 6 is a summary of the models. Section 7 is a discussion of findings and limits to the analysis.

2. Background

The utility of third-party certification is built upon theoretical arguments for an alignment of incentives from the producer to consumer despite information barriers about unobservable product characteristics. The theory builds upon two types of costs incurred by consumers when purchasing goods: the price of the good and the cost of finding the good, or "search cost" (Stigler 1961). Goods may be framed as a set of attributes, with consumers incurring search costs for specific attributes (Lancaster 1966). Search costs may be incurred for attributes that are possible to assess by inspection, such as price, and those that are possible to assess by experience, such as taste (Nelson 1970). Attributes that are not observable from the goods or experience, but for some other aspect of the good, such as method of production, are termed "credence attributes" (Darby and Karni 1973). Trusted information

about credence attributes of a good may reduce search costs and is valuable to consumers who would otherwise incur search costs for the credence attribute. One method of providing information for credence attributes is the use of certifications for the unobserved credence attribute (Gereffi, Garcia-Johnson, and Sasser 2001).

Certification of information for credence attributes is characterized by the party establishing rules and reporting. First-party is when a firm develops internal rules and reports on adherence to those rules. Second-party is when an industry or trade group create the standards and reporting mechanism. Third-party relies upon an external organization to develop rules and compliance, and fourth-party certification is when government or multilateral agencies create standards and reporting mechanisms (Gereffi, Garcia-Johnson, and Sasser 2001). Examples of shifts between types of certification exist. A prominent example is the shift from dominance of third-party certifications of organic food in the United States to fourth-party certification of organic. Between 1970 and 2000 over 40 third-party certifications of organic were developed within the United States (Fetter and Caswell 2002). In 1990 the US Congress created a National Organic Program (NOP) under the Agricultural Marketing Service, an arm of the United States Department of Agriculture (USDA). The NOP established standards for organic products, including lists of prohibited substances and production methods. In October 2002 the NOP set of standards defining organic (Jaffee and Howard 2010). Today the USDA standard of organic dominates the market for organic certification in the United States and creates a "ceiling" on standards of organic by prohibiting organic certifiers from enforcing stricter standards than those required by the USDA (Jaffee and Howard 2010).

Within the fisheries context certifications of sustainability are established and monitored by third-parties and provide information on the credence attribute of sustainable methods of production (Mattoo and Singh 1994; Wessells, Johnston, and Donath 1999; Gudmundsson and Wessells 2000). Consumers are hypothesized to show their preference for credence attributes of sustainable fishery

practices through increases in market share, or willingness to pay a price premium (Brécard et al. 2009; Wessells, Johnston, and Donath 1999; Mattoo and Singh 1994). Willing to pay for hypothetical eco-labels has been tested using contingent choice surveys, finding that preference was predicted by (a) price, (b) species, (c) consumer preference indicators, (d) demographics, (e) preferences for the certifying agency, and (f) knowledge and perceptions of the status of fish stocks (Wessells, Johnston, and Donath 1999).

3. Literature Review

A hypothetical third-party certification of sustainable seafood products was realized when the Marine Stewardship Council (MSC) certified the Thames herring and Western Australian rock lobster fisheries in 2000 as the first fisheries to meet their standard for sustainable fisheries practices (MSC 2018). The MSC had been founded in 1996 through a joint partnership between Unilever and the World Wildlife Fund (WWF) to create a certification to reduce search costs for information on the sustainability of seafood production. In 2018 the MSC reports 12% of the global marine wild catch is MSC certified through 296 certified fisheries and 67 fisheries currently in assessment (MSC 2017). The annual landings of MSC-certified fish in 2015 was estimated at 9.3 million metric tonnes (out of MSC's global estimate of 77.5 million metric tonnes) processed into over 20,000 products (MSC 2016b, 2016a).[12]

Following the creation of MSC researchers used surveys to test willingness to pay for a hypothetical eco-label for sustainability, or MSC certification (see Table 3). An advantage of using surveys to collect data on preferences for third-party certification is the ability to directly link preferences to demographic characteristics to build a profile of a consumer who is predicted to have the highest willingness to pay for sustainable certification (Brécard et al. 2009). The "typical" European consumer with high willingness to pay for certification of sustainable fisheries practices was found to be "a young woman, well

[12] The FAO estimate of global capture in marine fishing areas for 2014 was 81.5 million metric tonnes, thus making the 9.3 million metric tonnes certified by MSC a 11.6% share of global marine wild catch (FAO 2018).

educated, well informed on the state of marine resources and not very trusting of the regulation of the fisheries" (Brécard et al. 2009). Another advantage to the use of survey is the ability to provide information about the certification, or the state of fisheries, to test marketing strategies for creating acceptance of eco-labels. Information prompts, or even the tone of the information prompts, have been shown to predict a change in willingness to pay (Xu et al. 2012; Uchida, Roheim, et al. 2014; Uchida, Onozaka, et al. 2014). Finally, surveys allow the researcher to control variables such as the species and preparation of the product and only change one variable of interest. Disadvantages to the use of survey data to measure value of environmental preferences in general include a higher stated willingness to pay by up to 50% over actual expenditure measured, and an inflated percentage of individuals would be willing to pay for some environmental benefit (Seip and Strand 1992; Diamond et al. 1993). In the field of willingness to pay for eco-labels, the differences between market data and stated willingness to pay surveys have been found up to 138% (Jaffry et al. 2016; Bronnmann and Asche 2016).

The results of stated preference survey research on willingness to pay for third-party certification of sustainable fisheries ranges from a negative willingness to pay for certifications of sustainability to a price premium of 141%. Estimates vary widely by species, location of survey, and certifying body making generalized assertions problematic. Table 3 provides a summary of findings from survey-based studies that estimate a price premium for eco-labeled or MSC certified seafood products.

Citation	Location	Certification Type	Species	Findings
(Jaffry et al. 2016)	UK and Denmark	Eco-label	Various	-23% to 141% price premium
(Xu et al. 2012)	Beijing	Eco-label		50% of population willing to pay 4-6% price premium
(Uchida, Roheim, et al. 2014)	Japan	MSC	Salmon	0% - 20% Only shows premium if consumer is first given information about MSC
(Fonner and Sylvia 2015)	USA, OR	Eco-label, Local	Salmon, Dungeness	21% to 27% premium for eco-label, 22-27% for local labeled
(Olesen et al. 2010)	Norway	Organic or Freedom Food	Salmon	15% price premium for either organic or eco-label
(Uchida, Onozaka, et al. 2014)	Japan	Eco-label, Local, Wild/Farmed	Salmon	27% for local, 26% for eco-label, 10% for wild certification
(Roheim, Sudhakaran, and Durham 2012)	USA, RH	Aquaculture	Salmon, Shrimp	Negative willingness to pay for Aquaculture certified

Table 3 Summary of Survey-Based Research Estimating Price Premiums for Eco-labeled Seafood

A second approach to estimating price premium relies upon supermarket scanner records which carries the advantage of capturing data on revealed preference for eco-labeled products instead of survey data on stated preferences. The existing scanner data literature contains case studies from the EU and the USA. Within these studies the credence attribute of sustainability is only one of many variables that are estimated to impact willingness to pay. Other significant attributes include the manner of preparation (such as mince, fillet or breaded), the processing (chilled, fresh, once-frozen, twice-frozen), the country of sale, the country of origin, and the species of seafood (Roheim, Asche, and Santos 2011). Within the European Union the lowest estimate of a price premium for MSC certification is 3.6% in Germany, and the greatest is 14% in supermarkets around London. This literature also controls for certifications of other credence attributes, including line-caught cod for which the price premium is estimated at 18-25% in the UK, and various standards for organic that command a 20-30% price premium (Bronnmann and Asche 2016; Roheim, Asche, and Santos 2011; Ankamah-Yeboah, Nielsen, and Nielsen 2016; Aarset et al. 2000).

Research using scanner data provides a narrower band of estimated price premiums for third-party certification than survey data. In each case interpretation of a price premium across any two studies should be interpreted with caution, as key variables such as country, product form, and species of seafood all impact consumer preferences and vary between cases. Table 4 provides a summary of research on price premiums for MSC or eco-labeled seafood products using scanner data.

Citation	Location	Certification Type	Species	Findings
(Asche et al. 2013)	Glasgow, Scotland	MSC, Organic	Salmon	13% for MSC, 25% for Organic
(Sogn-Grundvåg, Larsen, and Young 2013)	UK	MSC, Line Caught	Cod, Haddock	10% for MSC, 18% for Line-caught
(Sogn-Grundvåg, Larsen, and Young 2014)	Glasgow, Scotland	MSC, Line Caught	Cod, Haddock, Alaska Pollock	13% for MSC, 25% for line-caught
(Roheim, Asche, and Santos 2011)	London	MSC	Alaska Pollock	14% for MSC
(Asche et al. 2015)	UK	MSC, Organic, Origin	Salmon	13% for MSC 25% for Organic, 4% for Local
(Aarset et al. 2000)	Norway	Organic	Salmon, Smoked Salmon	20-30% for Organic
(Ankamah-Yeboah, Nielsen, and Nielsen 2016)	Denmark	Organic (Danish Government)	Salmon	20% for Organic
(Hallstein and Villas-Boas 2013)	USA, CA	Various	Various	No significant findings
(Bronnmann and Asche 2016)	Germany	MSC, Aquaculture	Various, Alaska Pollock	3.6% for MSC, 40% for Aquaculture
(Blomquist, Bartolino, and Waldo 2015)	Sweden	MSC or KRAV (cannot distinguish)	Baltic cod	10% for MSC or KRAV
(Teisl, Roe, and Hicks 2002)	USA	Dolphin Safe	Tuna	1% market share increase for Dolphin Safe

Table 4 Summary of Market-Based Research Estimating Price Premiums for Eco-labeled Seafood

A more recent approach has been an exploration specifically to model the effects of a single product carrying multiple certifications in the same issue-space on willingness to pay a price premium. Tebbe and von Blanckenburg (2018) vary the addition of EU Organic, German Organic, Bioland Organic, Naturland Organic, Demer Organic and Biodynamic, and Fair Trade on a single product. The authors conclude that the survey respondents had a higher willingness to pay for goods that had any certifications, but that respondents are insensitive to the number of eco-labels, even if additional labels

carry different standards. For example, the researchers find a statistically significant 14.5% price premium for a product endowed with six labels relative to an unlabeled product. The researchers failed to find evidence that willingness to pay for products with additional labels where statistically different from one another: a product with one labels did not predict a statistically significant difference in willingness to pay from a product with six labels (Tebbe and von Blanckenburg 2018).

The existing empirical findings on the price premium for eco-labeled fishery products show variation in willingness to pay by demographic and product characteristics, but consistently show that consumers are willing to pay a price premium. However, no existing empirical research tests for an effect of additional certifications on a price premium for an existing third-party certified good.

Research Question and Hypotheses

The literature above prompts the research question: ***Does an increase in the number of certifications within a single issue-space result in outcomes similar to a subtractable good?***

To narrow this research question to a testable phenomenon I systematize the research question to an examination of benefits received by a MSC member that produces a third-party certified seafood product. The benefits received by these MSC club members are theorized to be price premium for certified products and additional market share when contrasted with non-certified products. Figure 1 below summarizes the types of benefits theorized to flow between customer and MSC club member.

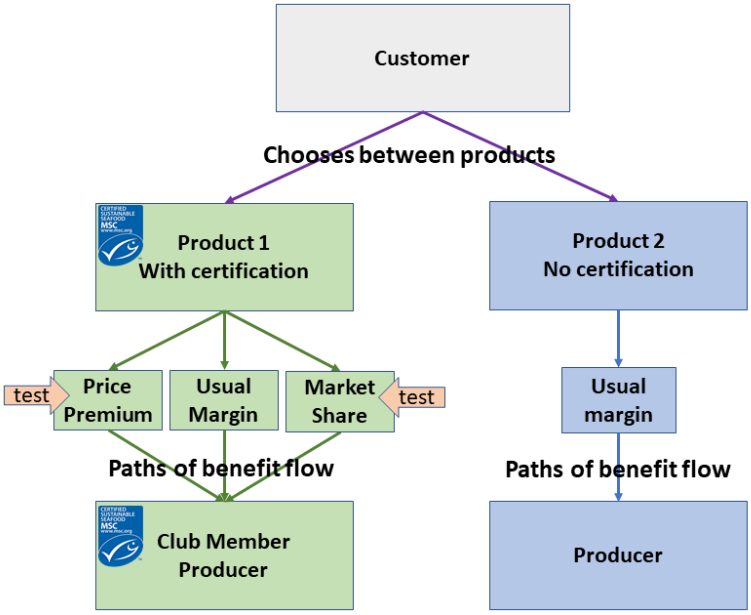

Figure 1 Model of benefits to club members with only one club

For this research the systematized research question is: *Do consumers change their preference for third-party certified goods as additional third-party certified goods enter the issue space?* I developed the following four hypotheses to test this question

> *H1: Additional third-party certification in the same issue-space decrease the market share of individual third-party certified goods.*
>
> *H2: Additional third-party certification in the same issue-space decrease the price premium a consumer is willing to pay for individual third-party certified goods.*
>
> *H3: Additional third-party certifications in the same issue-space increase the total market share for third-party certified goods.*[13]
>
> *H4: The interest in specific credence characteristics of any one third-party certification decreases as a function of increasing number of competing third-party certifications in the same issue-space.*

The first two hypotheses directly address the question of subtractability of benefits for membership in a voluntary club for sustainable fisheries practices. If benefits to club membership are lost with market

[13] The corollary hypothesis for this analysis is that the market share for non-certified goods decreases with additional entry of third-party certified options. The test of hypothesis three addresses both hypotheses.

entry of additional clubs, then voluntary members have less reason to remain in a club, or remain in a club with higher compliance costs than a competing club. These hypotheses are a test of the robustness of the linkage of benefits between club member firms through customers of third-party certified goods. The third and fourth hypotheses may provide insights the impact of additional certification on the benefits to any certification, and the impact on learning about certifications. Figure 2 below presents an alternative construction to Figure 1, where an additional club has entered the market for third-party certifications.

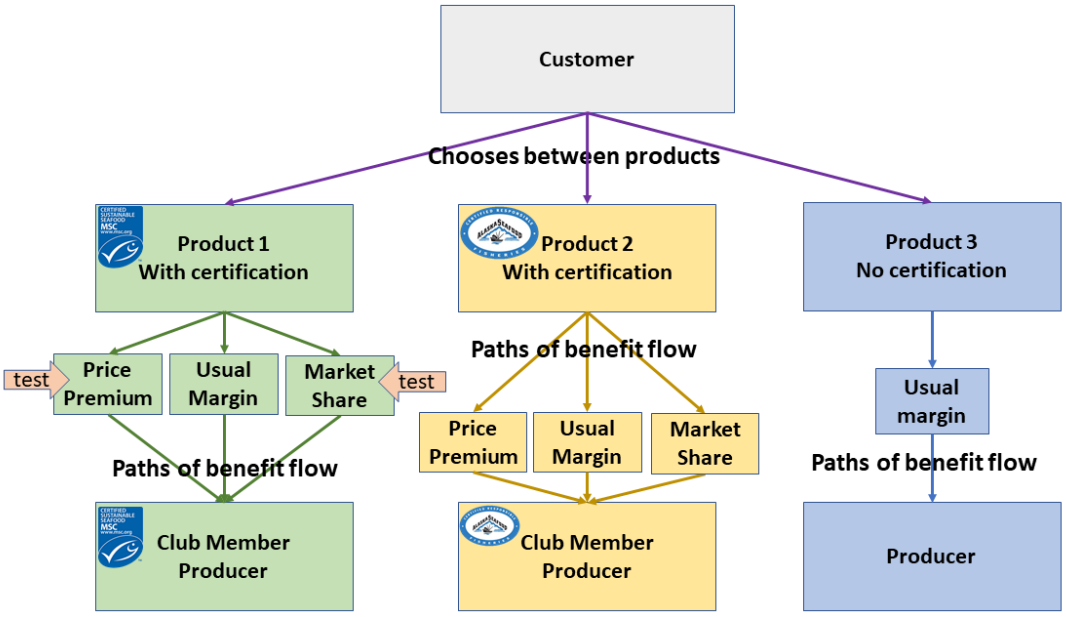

Figure 2 Model of benefits to club members with two clubs

4. Survey Design

To collect data to test my hypotheses I developed an online survey to test impacts of additional third-party certifications of sustainability. The survey presents a hypothetical but realistic grocery shopping scenario where one must choose between products with or without third-party certification of sustainability. Much like an actual grocery store experience, the respondent must choose which product

to buy. The survey consists of three variants. Each variant has a different number of competing third-party certifications.

The survey proceeds in the following manner. Respondents are screened to only admit people who state they perform their household grocery shopping and buy fish or fish products. Next, food certifications are introduced, and respondents may choose to learn more about certifications. Then third-party certifications of sustainable fisheries are introduced, and respondents may choose to learn more by clicking on individual certifications. Next, a scenario is presented where the respondent is shopping in their local grocery store and intends to buy fish sticks. The survey software displays a package of fish sticks with no certification and the respondent is asked to state what price they would expect to pay for that product. The price they enter is programmatically referenced through the remainder of the survey. Next, they are presented with third-party certified fish sticks and non-certified fish sticks at the price they stated they would expect to pay for fish sticks. They are asked to choose which product they would purchase if they were shopping for fish sticks. The following questions adds a 5% premium to the price for any certified options and again askes which product they would choose. They are asked how certain they are of their choice, prompted to provide a voluntary explanation for their choice and then asked demographic questions.

Respondents are randomly presented with one of three possible blocks of competing third-party certification. The first block contains one third-party certification and one uncertified option. The second block contains two certified goods and one uncertified. The final block has five certified goods and one uncertified option. Each respondent randomly sees one of the three blocks. A flow diagram of the survey is in Figure 3 below.

Figure 3 Flow diagram of survey showing three possible variations of questions

The survey software allows for randomization across blocks of questions, options within questions and the display of graphics. The software randomly selects which block of questions to display, randomizes

the order of presentation of third-party certifications, and randomizes the order of presentation of certified products. The software also allows for a balanced distribution of survey blocks.

The target population of this survey was individuals who shop for their household and who buy fish products. I distributed the survey in February 2018 using Mechanical Turk an online survey distribution tool which connects researchers with respondents who are paid to take surveys. The researcher may constrain the population frame using a description of the task and filters on who may see the task. For this survey I specified that only U.S. residents may respond and described the task academic research open to respondents who are grocery shoppers and buy fish or fish products. Respondents were paid one dollar for completing the survey which had a mean duration 4:49 (four minutes and forty-nine seconds).

The use of paid online respondents presents unique challenges to validity. I developed three methods to filter data from Mechanical Turk respondents. The first challenge for online surveys with nominal cash reward is the prevalence of respondents who complete surveys as quickly as possible to receive the reward. These respondents are unlikely to consider questions carefully and inclusion of their data would not address research questions. In the pretest of the survey the median survey duration was 4:09 and the standard deviation was 2:51. I culled responses more than one standard deviation below the median, so any responses with a total elapsed time of less than 1:18. A second challenge responses by individuals outside of the United States. I used internet service provider estimates of respondent location to remove respondents outside the United States. Third, respondents were given a voluntary option of adding text to explain their choice of product using the question: “What influenced your decision about which fish sticks to buy?” The question was followed by a text box. Pre-test of the survey showed over 95% of respondents choose to write a response to the question, indicating that they were reading at least some of the information provided and responding.

5. Data

Data collected for this analysis include demographic characteristics and the choice of fish stick products with various certifications in three contexts. Demographic characteristics include age, income, educational attainment, and frequency of buying fish products. Income and educational attainment were presented as categorical variables and the midpoint of the category was used as an estimate. For example, if a respondent stated they had "some college" but not "AA degree" then they were coded as 13 years of education. All respondents stated that they purchased fish or fish products and did the grocery shopping for their household in screening questions. All respondents were required to be from the United States, and their location was screened by internet service provider location estimate.

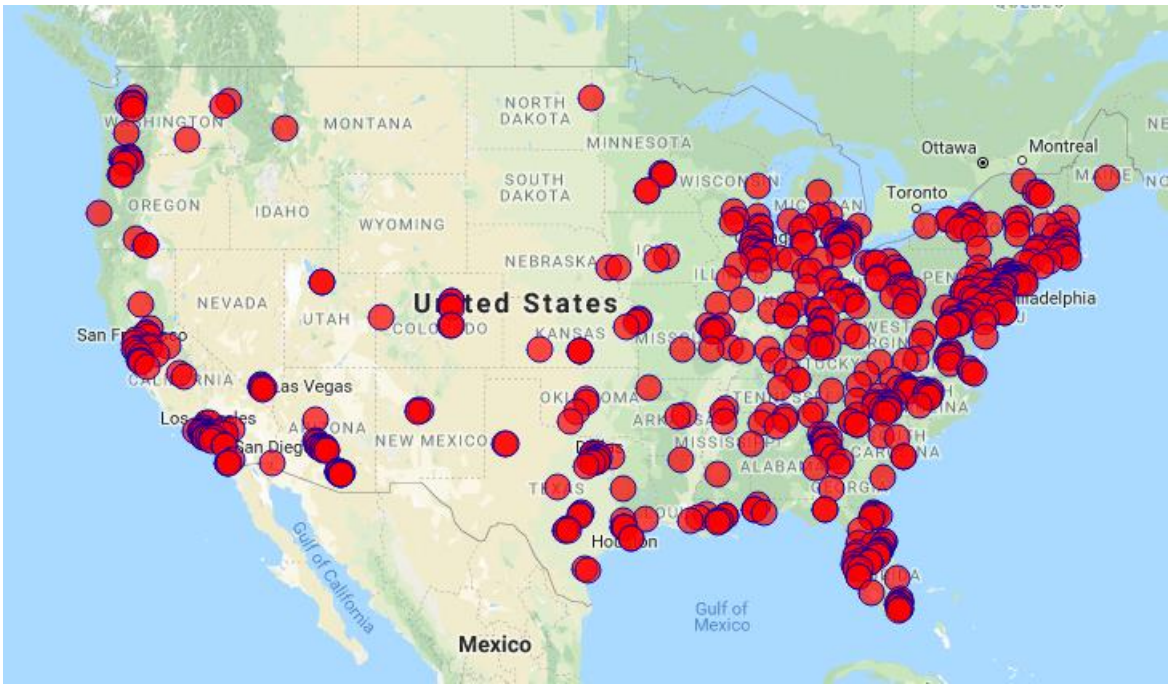

Figure 4 Map of estimate for respondent locations (excluding Hawaii)

Data for testing hypotheses include the choice of fish sticks under various treatment. Four variables were created to capture choice of fish stick options: MSC Same, MSC 5%, Any Same and Any 5%. For the variable "MSC Same" respondents choosing MSC certified fish sticks when the price was the same

between all options were coded 1, and 0 if they made any other selection. For the variable “MSC 5%” respondents choosing MSC certified fish sticks when MSC and all other certified sustainable choices incurred a 5% price premium were coded 1, and 0 if they made any other selection. For the variable “Any Same” respondents choosing any certified fish stick product at the same price were coded 1, and if they chose the non-certified option they were coded 0. For the variable “Any 5%” respondents were coded 1 if they chose any certified product at a 5% premium, and 0 if they chose the non-certified product.

The choice to learn more about certifications was captured in two variables, Learn More, and Learn More Seconds. The “Learn More” variable was coded a 1 if the respondent chose to voluntarily be shown additional information about any third-party certification standards, or all third-party certifications, and 0 if the respondent chose to skip all additional information. “Learn More Seconds” is a continuous variable capturing the number of seconds the respondent spent on the screens displaying additional information about any third-party certification. The voluntary text in response to the open-ended question “What influenced your decision about which fish sticks to buy?” may have been perceived to be mandatory. Respondents were coded as having made a voluntary text entry or not, and the number of characters included in the text response were calculated and may provide some measure of the attention spent on the survey.

Finally, the treatment of survey blocks was coded as 1, 2 or 3. Respondents who faced a choice between only MSC certified fish sticks and non-labeled fish sticks were coded as 1. Respondents who faced a choice between MSC certified, RFM certified fish sticks and non-labeled fish sticks were coded as 2. Respondents who faced a choice between 5 options of fish sticks bearing third-party certifications of sustainable fisheries and one non-labeled option of fish sticks were coded as 3. The survey block is treated as a categorical variable in subsequent analysis with block 1 as the base case. Table 5 below is a summary of the collected data followed by a histogram of number of characters in text response.

Variable	Treatment Block 1		Block 2		Block 3	
MSC same	199	98%	104	53%	78	37%
MSC 5%	165	81%	80	40%	60	29%
Any Same	199	98%	189	95%	207	99%
Any 5%	165	81%	147	74%	162	78%
Learn More	103	51%	105	53%	119	57%
Wrote Voluntary Text	202	99%	195	98%	209	100%
Number of Characters in Text (s.d)	64.6	(50.4)	68.4	(50.5)	69.9	(46.7)
Mean Learn More Seconds (s.d)	26.9	(21.8)	43.1	(46.7)	65.2	(107.9)
Mean Age (s.d)	39.8	(10.4)	41.4	(10.9)	40.4	(10.9)
Mean Income (s.d)	58,892	(37,534)	58,838	(34,019)	54,569	(35,128)
Mean Education (s.d)	14.9	(2.3)	14.8	(2.2)	15.0	(2.1)
Mean Frequency Buy Fish (s.d)	3.7	(2.5)	3.5	(2.2)	3.3	(2.1)
Number of observations	203		198		209	
Total observations	610					

Table 1 Summary of Survey Data

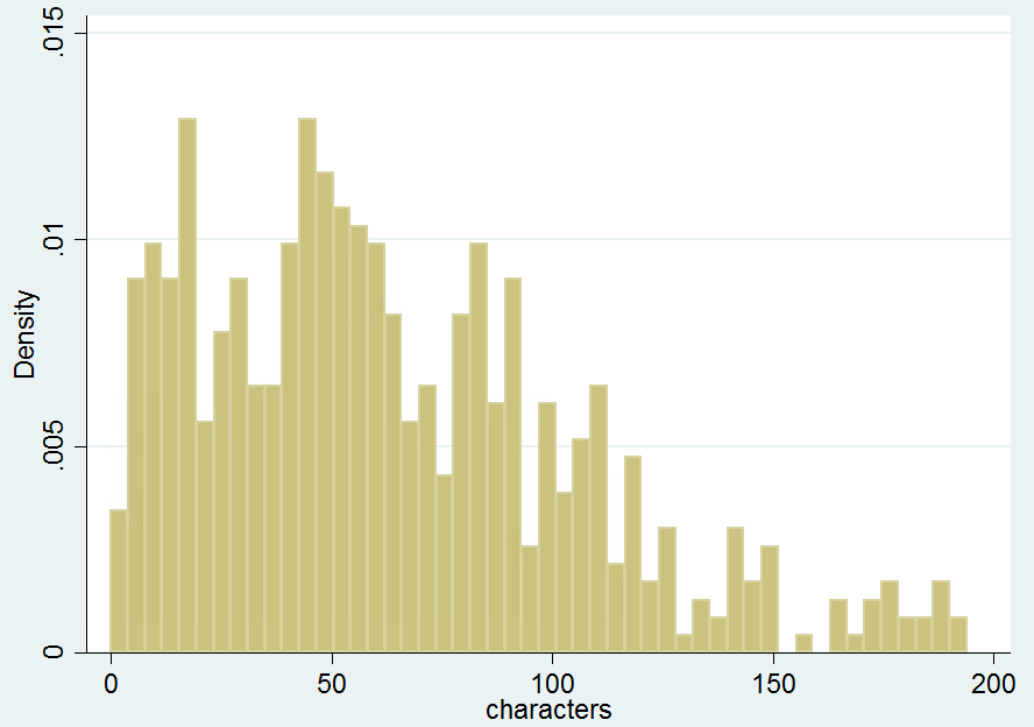

Chart 2 Histogram of Number of Characters

6. Models

The first analysis is a difference of proportion test. The difference of proportion test is used to test the null hypothesis that proportions of respondents choosing the dependent variable is equal across blocks representing the number of competing third-party certified goods presented to the respondent. The goodness of fit metric for a test of proportions is χ^2, and the p-value is a measure of the significance of the findings.

For example, the null for hypothesis one is that the proportion of respondents choosing fish sticks bearing certification of sustainability by MSC remains constant as the number of certified sustainable options increases. If P_1 is the proportion that choose MSC in block-1 context, P_2 in the block-1 context and P_3 in block-1 context, then the null hypothesis is: $H_0 : P_1 = P_2 = P_3$. Disproving the null hypothesis that all three proportions are equal may be followed by paired t-test between each of the three pairs of proportions to test if the dependent variable proportion is consistent across any of the three contexts. Using the same notation as above and adding a letter for each pair of tests gives $H_{0a}: P_1 = P_3$; $H_{0b} : P_1 = P_2$; $H_{0c} : P_2 = P_3$. Serial tests on the same data increase the likelihood of a Type 1 error, the incorrect rejection of a true null hypothesis. The Bonferroni correction enables a correction of the alpha based on the number of tests run. In the pairwise test each proportion is used twice so the new alpha required for an assertion at the alpha 0.05 is .05/2 = .025 meaning that an alpha = .025 is the correct measure to use as a rejection threshold.

The second analysis for hypotheses one, two and three is to fit the proportion of individuals choosing the dependent variable using logistic regression. The advantage of the logistic regression model is the ability to predict outcome on an individual level, and to include additional independent variables. The logit takes the standard form:

$$\text{Ln}(P/1\text{-}P) = \alpha + \beta X$$

where the log of the odds of a choice for the certified good (P) by respondent is a function of a constant (α) and a beta matrix (β) multiplied by the matrix of our independent variables (X). The dependent variable for hypothesis one is the choice of MSC certified fish sticks. The independent variables are if the respondent asked for more information on certifications, age, frequency of buying fish, education and log of income. In this case logit can be used to include data from each of the three random blocks to predict the change in log odds of a respondent choosing the dependent variable. For example, to test hypothesis one the dependent variable is choosing MSC and the principle independent variable of interest is the is the block, which is a categorical variable for the number of competing choices faced by the respondent. The base case for the categorical variable block is block 1, so the interpretation of beta coefficients for block 2 and 3 are in comparison to the omitted block 1. In the logit model the goodness of fit is the χ^2 the measure of the power of prediction of the independent variables is a z score.

7. Findings and Discussion

Table 4 presents a summary of the proportion tests across each block of treatments of 2, 3 or 6 choices of third-party certified products. The leftmost column of Table 4 shows the proportion tested. The tests are of MSC Same, MSC 5%, Any Same, Any 5% and the binary measure of Learn More.

Model	Null hypothesis	chi2	df	p-value	Test outcome
MSC Same	P1=P2=P3	174.20	2	0.0000	Reject
MSC 5%	P1=P2=P3	124.60	2	0.0000	Reject
Any Same	P1=P2=P3	5.76	2	0.0561	Fail to reject
Any 5%	P1=P2=P3	2.89	2	0.2378	Fail to reject
Learn More	P1=P2=P3	1.63	2	0.4426	Fail to reject
MSC Same	P1=P2	109.94	1	0.0000	Reject
	P2=P3	8.90	1	0.0029	Reject
	P1=P3	169.53	1	0.0000	Reject
MSC 5%	P1=P2	77.23	1	0.0000	Reject
	P2=P3	5.65	1	0.0174	Reject
	P1=P3	112.71	1	0.0000	Reject
Any Same	P1=P2	1.38	1	0.2405	Fail to reject
	P2=P3	3.71	1	0.0542	Fail to reject
	P1=P3	0.20	1	0.6547	Fail to reject
Any 5%	P1=P2	2.48	1	0.1151	Fail to reject
	P2=P3	0.43	1	0.5124	Fail to reject
	P1=P3	0.68	1	0.4103	Fail to reject
Learn More	P1=P2	0.13	1	0.7195	Fail to reject
	P2=P3	0.48	1	0.4887	Fail to reject
	P1=P3	1.35	1	0.2448	Fail to reject

Table 2 Proportion Tests Results. The proportion measured is indicated in the left column. The proportions choosing that measure are indicated by treatment. P1 is the proportion of individuals in treatment one, with two options of fish sticks, one MSC certified and on non-certified. P2 is the proportion of individuals in treatment two, with three options, and P3 is the proportion of individuals in treatment three with six options.

The tests of difference of proportion show these data provide evidence to support the rejection of the hypothesis that the proportion of respondents who chose a MSC certified at the same price as alternatives products remain constant with a change in the number of alternative certified products in the same issues space. This provides evidence in support of hypothesis 1, that additional third-party certifications in the same issue-space decrease the market share of individual third-party certified

goods. The subsequent paired t-tests provide evidence that proportions choosing a MSC certified product are unique for each treatment.

The second finding from difference of proportion tests provides evidence to reject the null hypothesis that the proportion of respondent who chose MSC certified product at a 5% price premium remains constant despite a change in the number of alternative certified products in the same issue space. The subsequent paired t-test shows a difference between behavior when respondents faced a choice of MSC certified product and a non-labeled product and when they face a choice of MSC certified product, a second certified product, and a non-certified product. This provides evidence in support of hypothesis two, that additional third-party certifications in the same issue-space decrease the price premium for one certified product. The remainder of the proportion tests failed to disprove null hypotheses that the proportions of respondents changed behavior as a function of the set of options they faced.

Table 5 presents the summary statistics for logit and generalized linear model models. Dependent variables are choice of MSC product with price held constant, choice of MSC certified product with 5% price premium, choice of any certified product with price held constant, choice of any certified product with a 5% price premium, choice to learn more about certifications, and log of seconds spent on voluntary material on third party certification standards.

	H1		H2		H3a		H3b		H4a		H4b	
	MSC Same		MSC 5%		Any Cert. Same		Any Cert. 5%		Learn (1/0)		Log Learn Seconds	
Block 2 (3 options)	**-3.82*** **	(0.00)	**-1.84*** **	(0.00)	**-1.03***	(0.1)	**-0.45***	(0.07)	0.09	(0.67)	**-0.03** **	(0.02)
Block 3 (6 options)	**-4.45*** **	(0.00)	**-2.38*** **	(0.00)	0.68	(0.44)	-0.32	(0.21)	0.28	(0.16)	**-0.049*** **	(0.00)
Age	**-0.027*** **	(0.00)	**-0.016** **	(0.05)	**0.059***	(0.06)	0.01	(0.18)	0.01	(0.12)	**-0.002*** **	(0.00)
Log Income	0.08	(0.56)	0.02	(0.85)	0.29	(0.42)	-0.22	(0.12)	0.11	(0.34)	0.00	(0.92)
Education	-0.05	(0.27)	0.00	(0.96)	-0.07	(0.59)	0.02	(0.68)	-0.02	(0.57)	0.00	(0.43)
Learn	**-0.471** **	(0.02)	0.16	(0.38)	**1.48** **	(0.02)	**1.08*** **	(0.00)				
Buy Fish	0.07	(0.14)	0.04	(0.31)	0.05	(0.72)	**0.081***	(0.1)	**0.075** **	(0.05)	**0.004***	(0.09)
Constant	**4.97*** **	(0.00)	1.67	(0.26)	-1.08	(0.79)	2.33	(0.15)	-1.57	(0.23)	**0.35*** **	(0.00)
Model Statistics												
N	610		610		610		610		610		327	
Log Likelilhood	-286.12		-353.89		-61.42		-303.61		-416.46		-715.38	
chi2	235.12		137.86		17.95		40.14		9.55		38.73	
p	0.00		0.00		0.01		0.00		0.14		0.00	

*Table 3 Findings. For each variable the top row is the beta coefficient shown in log odds and the subsequent row is p-value. *, **, and *** denote significance at alpha = .1, .05 and .01 levels.*

The models summarized in Table 5 show summary values for six models. The models are labeled by the hypotheses the model tests. For example, the models labeled H1 and H2 are tests of hypothesis one and two. The dependent variable is identified below the model name; for model H1 the dependent variable is the choice of MSC certified product in a context where all certified and non-certified products bear the same price. Each of the model has a binary dependent variable and is a logistic regression, except for H4b, which uses a dependent variable with uniformly positive continuous values and is fit to a generalized linear model with a gamma distribution. For each model the independent variables are on noted on the left of Table 5. Significant beta coefficients are marked with asterisks and are in bold text. Beta coefficient p-values are included in parentheses below each beta. In each model the treatment is expressed as a difference from block 1. Thus, the beta coefficients in block 2 show the difference between block 2 and block 1, and the beta coefficients in block 3 show the difference between block 3 and block 1.

Models H1 and H2 concern the choice of MSC certified product in a context where prices are held constant, or where there is a 5% price premium for any certified good. For models H1 and H2 the probability of getting the chi2 value where the independent variables have no predictive effect is less than .0001 indicated that the independent variables are likely to predict changes in the dependent variable. The treatment variables of block 2 and block 3 are statistically significantly different from block 1 in models H1 and H2. These models show that the number of alternative third-party certified goods predicts a decrease in the market share for the MSC-certified product in contexts where prices is constant across options, and when third-party certified goods carry a 5% price premium. The coefficients are significant and negative, indicating that the proportion of respondents choosing MSC-certified products decreases with addition of alternative certified options. The size of the effect may be interpreted as a change in log odds, or it may be transformed to odds ratios by exponentiating the beta coefficient. Thus the change in odd ratio of choosing MSC-certified fish sticks between a context with

one alternative non-certified option and a context with 4 alternative certified sustainable options and one non-certified option is exp(-4.14) or a change in odds ratio of .0158. Models H1 and H2 provide support for hypotheses one and two, that increasing the number of alternatives to MSC result in a loss in market share when prices are uniform, or when certified goods have a price premium.

Models H3a and H3b concern the effect of increasing the number of certifications on a respondent's choice of any certified option. Both model level goodness of fit statistics show that the independent variables have a predictive effect on the dependent variable. In each case the independent variables that are significant is the binary measure of voluntary exposure to additional reading material on the standards for certification of sustainability. Models H3a and H3b show a statistically significant and negative change in the choice of any certified product when comparing a choice of only one certified option and one non-certified option against two certified options and one non-certified option. In each case the choice to see additional material increased the log odds of choosing any certified product. Models H4a is not a significant predictor of the dependent variable. Model H4b shows a consistent negative effect of additional certifications on a respondent's time spent exposed to information on certification standards.

Discussion

This research was a first attempt to test the impact of additional options of certified products on existing certified products. A survey of n=610 was used to elicit choices in a hypothetical grocery shopping experience where a consumer was presented with products carrying differing third-party certification of sustainable fisheries practices. The sample was split, and respondents saw one of three set of options: (1) MSC certified product and a non-certified product; (2) MSC certified product, another certified product and a non-certified product, and; (3) MSC certified product, four other certified products and a non-certified product. Response data were tested to determine if the number of competing certifications predict the choice of a MSC certified product at the same price or at 5% price premium, if

number of options impacted the choice of any certified product at the same price or at a 5% premium, and if the number of options predicted a decrease in voluntary attention to information on standards of sustainability. The data were tested using three proportion tests, paired t-tests, and logit or generalized linear models. This research found evidence that increased numbers of certifications decreased the market share of MSC and decreased the willingness to pay a 5% premium for MSC certified products. This research also found evidence that respondents spent less time learning about certifications when faced with a greater number of competing certifications in the same issue-space.

The survey used MSC certified products as a case study to examine the subtractability of benefits enjoyed by voluntary club members. Club goods are excludable because club members can prevent non-members from capturing club benefits and non-subtractable because the benefits of one club member do not subtract from the benefits of another club member. Clubs granting third-party certification of environmental practices are theorized to use market-based solutions that incur low costs to government, enable environmentally responsible firms to make additional profits, enable customers to express their preferences for sustainable products and produce positive environmental changes. The successful use of clubs to produce third-party certification relies upon customers choosing third-party certified products over non-certified products, which often means demonstrating willingness to pay a non-trivial price premium for third-party certified products to incentivize producers to join or maintain sustainability certification and adhere to responsible fishing standards. This research is a first attempt to quantify the impact of additional clubs entering the market for third-party certifications of sustainable fisheries. The hypothesis was that additional clubs entering the market would break one linkage of benefits enjoyed by club members. The test of MSC-certified products was the first known effort to test the robustness of benefits to club members upon the entry of additional clubs to the same issue-space and subsequent additional third-party certified goods in the same issue-space. This research found evidence of a decrease in market share for the incumbent third-party certified product at the same price

or a 5% price premium compared to non-certified options, a decrease in the percentage of people choosing any certified good and a decrease in the amount of time respondents spent learning about certifications. This research raises questions about the robustness of incentive chains for third-party certified goods that may be explored in additional issue-spaces, or with additional survey or market-based research in the issue-space of sustainable fisheries. This research also raises questions about the robustness of the alignment of incentives for club members to remain in clubs when additional clubs enter the market. If additional market entry of third-party clubs into a single issue-space reduces incentives to remain in voluntary clubs, then an alternative policy options to retain the alignment of incentives may be to reduce the number of clubs, including establishing a single set of governmental standards or fourth-party club.

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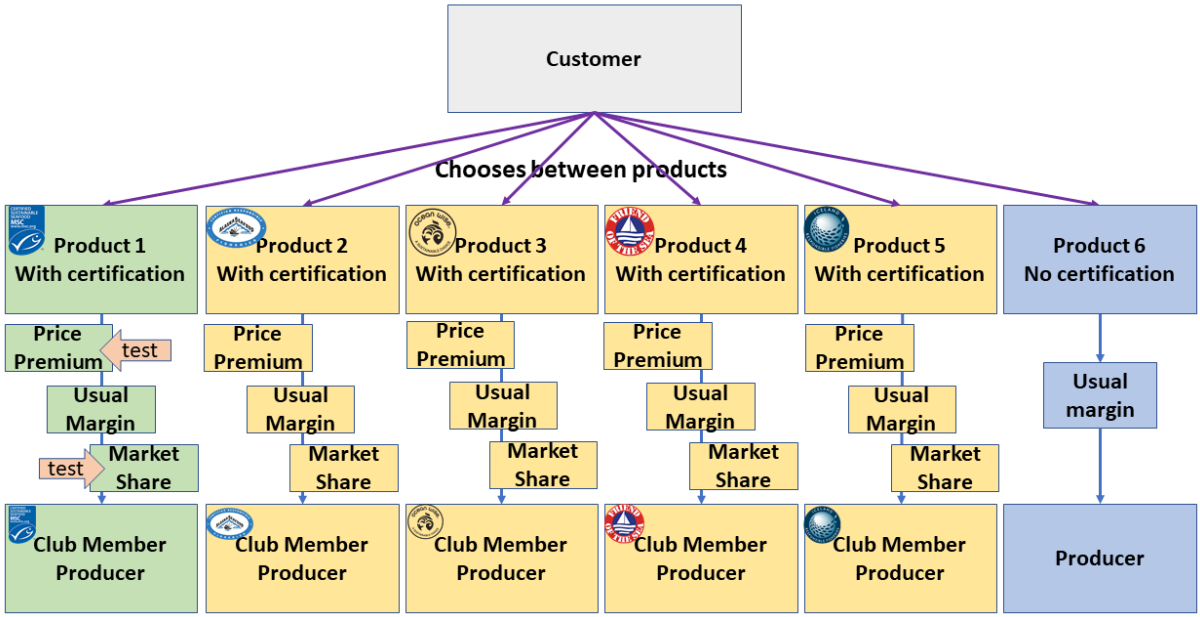
Appendix A

Choice set faced by consumer with 5 third-party certifications in the same issues space and benefit path to individual club members and non-member producers.



Appendix B

Data dictionary for survey.

StartDate	Start Date
EndDate	End Date
Status	Response Type
Progress	Progress
Duration (in seconds)	Duration (in seconds)
Finished	Finished
RecordedDate	Recorded Date
LocationLatitude	Location Latitude
LocationLongitude	Location Longitude
DistributionChannel	Distribution Channel
UserLanguage	User Language
Q1	Who does the grocery shopping for your house?
Q2	Do you buy fish or fish products for your household?
Q3	This survey is about food certifications. An example of a food that is certified is "fair trade" certified coffee, or "free range" certified eggs. This survey is about certifications of sustainability in seafood products. Certifications are independent. A certification organization creates a policy to define sustainable. Producers can voluntarily choose to apply to be certified as sustainable. If the producer passes the test of sustainability, then they are certified as sustainable. The producer then gets to tell customers that they have independent certification of sustainability. Usually the packaging has a little sticker that says it is certified as sustainable. Does this explanation of certifications make sense?
Q4	Independent certifications can be used so that consumers can show if they care about a particular issue that is hard to identify by looking at the product. For example, imagine a shopper who cares strongly about cage-free eggs. It is hard to tell if a hen was in a cage or not by looking at an egg. When a producer gets independent certification they can provide evidence that the hens are not in cages. This shopper could see the "certified cage-free eggs" logo on the carton and choose to buy certified cage-free eggs. Some people think that producers will change their practices if enough people demand certification about aspects of production. Have you ever heard of these types of certifications?
Q6	Would you like to learn more about MSC standards of sustainability?
Q62_First Click	Timing - First Click
Q62_Last Click	Timing - Last Click

Q62_Page Submit	Timing - Page Submit
Q62_Click Count	Timing - Click Count
Q7	(Text from the certification websites)
Q9	What price would you expect to pay in your local grocery store for a package of fish sticks like this? (For this survey the price is bounded between $0 and $20)
Q10	Now you notice that there are other options of fish sticks. You see two options. The price is the same for both, it is $ [QID41-ChoiceTextEntryValue] Which of the options would you choose to buy?
Q12	Would you be willing to pay a 5% premium for the certified sustainable option? The price for the fish sticks with no certification is $ [QID41-ChoiceTextEntryValue] The 5% premium would be $ $e{ round(q://QID41/ChoiceTextEntryValue * 1.05 , 2) }
Q14	How certain are you about the choice you just made?
Q15	What influenced your decision about which fish sticks to buy?
Q17	Would you like to learn more about MSC or RFM standards of sustainability?
Q63_First Click	Timing - First Click
Q63_Last Click	Timing - Last Click
Q63_Page Submit	Timing - Page Submit
Q63_Click Count	Timing - Click Count
Q18	(Text from the certification websites)
Q64_First Click	Timing - First Click
Q64_Last Click	Timing - Last Click
Q64_Page Submit	Timing - Page Submit
Q64_Click Count	Timing - Click Count
Q21	What price would you expect to pay in your local grocery store for a package of fish sticks like this? (For this survey the price is bounded between $0 and $20.)
Q22	Now you notice that there are other options of fish sticks. You see three options. The price is the same for each option, it is $ [QID40-ChoiceTextEntryValue] Which of the three options would you choose to buy?
Q23	Would you be willing to pay a 5% premium for either of the certified sustainable options? The price for the fish sticks with no certification is $ [QID40-ChoiceTextEntryValue] The 5% premium would be $ $e{ round(q://QID40/ChoiceTextEntryValue * 1.05 , 2) } Which of the three options would you choose?
Q25	How certain are you about the choice you just made?
Q26	What influenced your decision about which fish sticks to buy?
Q28	Would you like to learn more about MSC, RFM, IFM, OW or FOS standards of sustainability? Choose all that you would like to learn more about.
Q65_First Click	Timing - First Click
Q65_Last Click	Timing - Last Click

Q65_Page Submit	Timing - Page Submit
Q65_Click Count	Timing - Click Count
Q29	(Text from the certification websites)
Q66_First Click	Timing - First Click
Q66_Last Click	Timing - Last Click
Q66_Page Submit	Timing - Page Submit
Q66_Click Count	Timing - Click Count
Q67_First Click	Timing - First Click
Q67_Last Click	Timing - Last Click
Q67_Page Submit	Timing - Page Submit
Q67_Click Count	Timing - Click Count
Q68_First Click	Timing - First Click
Q68_Last Click	Timing - Last Click
Q68_Page Submit	Timing - Page Submit
Q68_Click Count	Timing - Click Count
Q69_First Click	Timing - First Click
Q69_Last Click	Timing - Last Click
Q69_Page Submit	Timing - Page Submit
Q69_Click Count	Timing - Click Count
Q35	What price would you expect to pay in your local grocery store for a package of fish sticks like this? (For this survey the price is bounded between $0 and $20)
Q36	Now you notice that there are other options of fish sticks. You see several options. The price is the same for each, it is $ [QID39-ChoiceTextEntryValue] Which of the options below would you choose to buy?
Q37	Would you be willing to pay a 5% premium for any of the certified sustainable option? The price for the fish sticks with no certification is $ [QID39-ChoiceTextEntryValue] The 5% premium would be $ $e{ round(q://QID39/ChoiceTextEntryValue * 1.05 , 2) } Which of the products would you buy?
Q39	How certain are you about the choice you just made?
Q40	What influenced your decision to state a price you would be willing to pay for the certified fish sticks?
Q41	Fish sticks are made with a type of fish called pollock. Did you know that pollock is certified as sustainable by both MSC and RFM?
Q58	The next couple of questions are for demographic purposes. Please select the option that best describes you. What is the highest degree or level of school you have completed? (If youâ€™re currently enrolled in school, please indicate the highest degree you have received.)
Q59	How many times have you purchased fish or fish products in the last month?
Q42	In which year were you born?
Q43	What is your household income range?
MTurkCode	MTurkCode