

BECOMING A FOOD CITIZEN:
CAN ECO-CITIZENS REALIZE THEIR OBLIGATIONS TO SUSTAINABLE
CONSUMPTION GIVEN THE CONFINES OF THE GLOBALIZED FISH
MARKET?

by

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ABSTRACT

Environmental citizenship is positioned as a platform where the rights of social and environmental justice converge with civic engagement and responsibility. As industrialized economies continue to exhaust the limits of finite natural resources and exacerbate conditions of global climate change, scholars have questioned if environmental citizenship models offer a method for deepening obligations to a sustainable movement.

In the material culture enjoyed by Western civilizations, existing research supports that an individual's purchases are seen as an indicator of their values and identities. Consequently the commitment to responsible buying behavior or sustainable consumption is in a sense an expression of eco-citizenship. My thesis offers a critical perspective of Andrew Dobson's ecological citizenship theory, by asking how sustainable consumption can be conceptualized in the existing political and economic infrastructures. Using a thorough case study of globally traded fish provisions, I investigate the existing barriers for eco-citizens attempting to realize their obligations to sustainable consumption. This analysis allows me to draw conclusions on how these barriers may inhibit eco-citizenship theories and ultimately a sustainable social movement.

The structure of this thesis is broken into three parts. First, I define existing theories of ecological citizenship and sustainable consumption, including the theoretical propositions, requirements, and limitations. Secondly, I rely on Dobson's conception of ecological citizenship and an instrumental case study of Pacific Salmon provisions to illustrate the barriers eco-citizens encounter in the current market and regulatory system. Finally, this paper concludes by proposing individual and institutional changes that will assist in fostering an eco-citizen community and the contribution my findings may have on existing green citizenship research.

This work is dedicated to my father and grandfather, for their endless faith and encouragement in all of my endeavors.

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CHAPTER ONE: INTRODUCTION

Science cautions that the anthropogenic impact on our planet has reached a tipping point. Global climate change and the impending concern of scarcity is one of the greatest threats to civilization (Meadows, Meadows, & Randers, 2004; Brown 2011). The existing literature calls for a paradigm shift. This shift will require every person, business, and government to be held responsible for their ecological footprint; this shift will be nothing short of a revolution involving every facet of our constructed civilization. Finding such a platform to initiate a sustainable revolution is one of the greatest challenges facing environmentalists.

Environmental citizenship is positioned as a platform where the rights of social and environmental justice converge with civic engagement and responsibility. These duties assume a level of humanitarian responsibility and are fueled by awareness, education, and a global connectedness (Dobson 2003; Smith & Pangsapa 2008).

Environmental citizenship, or what will be defined later as ecological citizenship, offers a framework for developing an obligatory relationship to sustainable behavior. By nature ecological citizenship is transformational. Cosmopolitanism, equity, and justice are central facets underpinning Andrew Dobson's conception of ecological citizenship. His theoretical proposition is reliant on an open democratic process and a platform for public and private participation (Agyeman and Evans 2006; Dobson 2006). Environmental citizenship suggests the advancement of pro-environmental values and attitudes into a committed set of norms and behavior (Dobson 2006; Smith & Pangsapa 2008).

What behavior is considered pro-environmental? In the material culture enjoyed by Western civilizations, an individual's purchases are seen as an indicator of their values and identities. As

mundane and at times paradoxical as it may seem, sustainable consumption or buying “green or ethical goods”, have increasingly been tied to activism and is considered an expression of green citizenship (Seyfang, 2005). Specifically, the food industry has provided the opportunity for such an expression. The consumption of organic, environmentally responsible, and ethical food products suggests the movement towards an educated and ecological consumer conscience (Smith & Pangsapa, 2008; Seyfang, 2005).

My thesis offers a critical perspective of ecological citizenship, by asking how theories of sustainable consumption can be conceptualized in the existing political and economic infrastructures. *Can eco-citizens realize their obligations to sustainable consumption given the private and public confines of the globalized fish market?* Using a thorough case study of globally traded fish provisions, I investigate if an eco-citizen is afforded the opportunity and information to carry out sustainable principles in their consumption of fish product. Specifically, I use an instrumental case study method to examine the market infrastructure for globally traded Pacific Salmon. Ultimately, this analysis allows me to draw conclusions on the opportunity for an ecological citizenship to participate in sustainable fish market and to outline the implications this may have on ecological citizenship theory. If the opportunities are limited, how does the existing economic and political system confine the opportunity for ecological citizens?

Increases in population, the growing prosperity of developing countries, in combination with global climate change create imperative challenges to resource and food scarcity. Brown (2011) writes that global climate change and its implications for food and resources is one of the greatest threats facing humanity.

Food production will have to rise by 70 percent by 2050 to keep up with the global population growing to 9 billion, particularly with the explosion of megacities in developing

countries and with changing diets in such countries as China and India (Oosterveer & Sonnenfeld, 2012, p.2).

Fish currently makes up more than 35 percent of the total animal protein supply with the majority of aquaculture (estimated 63%) production going to China (Oosterveer & Sonnenfeld, 2012, p.2).

In the *Limits to Growth*, the authors call for a sustainable revolution – a political, cultural, and social shift in the way we handle the environment and each other that will allow for humanity, as a whole, to minimize their ecological footprint (Meadows, Meadows, Randers, 2004). Most scholars acknowledge that a sustainable revolution will be a gradual social movement. A social movement of this magnitude challenges the current methods we use in our daily lives and will require some sort of inspiration in order to ignite such a change (Seyfang 2005; Smith & Pangsapa 2008).

The possibility of a new, more democratic, ultimately more *adult* environmental politics can only be realized when and where we act – in our roles as citizens, activists, students, and scholars... A new politics is only possible if we recognize and engage – rather than paper over and suppress (Maniates & Meyer, 2010, p. 319).

Ecological citizenship offers an opportunity to articulate and develop more mature environmental politics that, which in turn will ultimately reinforce the pursuit of sustainable solutions in our public and private lives. As I describe in later chapters, environmental citizenship is posed as a platform to strengthen obligations of equity and justice. By recognizing in a globalized economy - one must expand their community and realize the ties that bind community members may be harmful.

Ecological citizenship develops, from the realization that these harmful ties may threaten basic human principals of equity and fairness. However, eco-citizenship is mostly discussed as an abstract and is rarely conceptualized (Seyfang, 2005). Thus, one of the underlying intents of this paper is to discuss if and how ecological citizenship theory may be applicable in an empirical study.

My thesis critically questions the ability for an ecological citizen to realize his pursuit of sustainable consumerism given the restraints of a globalized market and a convoluted regulation system. The general research question of my thesis can be summarized into the following: *Can eco-citizens realize their obligations to sustainable consumption given the private and public confines of the globalized fish market?*

My research uses the infrastructure of globally traded Pacific Salmon to illustrate the limitations and obstacles that face eco-citizens when trying to buy sustainable food products. Through a comprehensive analysis of the current fish market and regulation system, I intend to illustrate whether or not an eco-citizen is provided with the product information and opportunity to exercise sustainable and ethical principles of consumption. Furthermore, I examine the role of eco-labels, fish retailers, and the regulating structure in the Pacific Salmon industry. It is the intent of this research to determine if they are conducive to nurturing a deliberative process that is both a right and a requirement for an ecological citizen. I outline the collective cooperative measures and reform that is needed to facilitate an eco-citizen's opportunities for sustainability in a global market. By questioning the information and opportunities available in a market which fulfills our most basic needs, this research seeks to provide insight into the viability of ecological citizenship in the confines of a competitive, globalized, and convoluted, market.

The structure of this thesis is broken into three parts. First, I define ecological citizenship and identify its theoretical propositions, requirements, and limitations. I examine the importance of values and behaviors in developing ecological citizenship. I also define sustainability and further elaborate on the relationship between eco-citizenship and sustainable consumption. I review previous literature that presents sustainable consumption as an expression of eco-citizenship. In the second section I use an instrumental case study of Pacific Salmon provisions to illustrate the barriers eco-citizens encounter in the current market and regulatory system where fish products are

produced and consumed. I rely on the theoretical support of Dobson's ecological citizenship theory to question whether practicing eco-citizenship is even possible. By both the private and public standards Dobson, is it possible to realize the political and social obligations of citizenship in a capital market where deliberation, democracy, and transparency is not readily conceptualized. I offer a critical perspective on the opportunity for the ecological citizen to commit to a sustainable belief system and express their obligations to sustainable consumption of fish product. Finally, my thesis concludes by proposing individual and institutional changes that will assist in fostering a partnership for ecological citizens and further outlines the contribution these finding may have on existing research and theories of green citizenship.

CHAPTER TWO: LITERATURE REVIEW

This literature review is divided into three main sections. In the first section I define ecological citizenship. In order to identify the goals and orientation for environmental citizenship, I briefly discuss the various interpretations and the historical context of environmental citizenship. Then I introduce Andrew Dobson's definition of ecological citizenship and outline the theoretical foundation that it relies upon. In the second section, I define sustainability and sustainable conception. In the current literature, sustainability is a hotly contested subject. The terms are typically vague, ambiguous, and difficult to measure. I outline several different conceptions and their various objectives in order to illustrate the role of sustainable consumption for ecological citizens (Dobson, 2003). Lastly, I use the literature review to outline the ways in which ecological citizenship is being used to better articulate and realize the goals for sustainable consumption.

Defining Ecological Citizenship

Conventional citizenship theory defines the material and social relationship of a community within a given territory. As globalization has expanded our communities and in many ways eroded nation-state territories, we have seen citizenship theory being used to describe complex social and material relationships that often transcend state territories. Citizenship is broadly defined as the establishment of contractual relationships between states and citizens and, more recently, citizen to citizen (Smith & Pangsapa, 2008, p. 3). As a result of the environmental justice movement and the promotion of global citizenship, environmental advocacy now incorporates underlying principles of respect, equity, and virtue for all (natural and human) members of a community.

Key to this development is a greater awareness of the importance of obligations within the terms of citizenship, an understanding that the enjoyment of rights carries corresponding

duties to act in a manner that contributes to one's community or at least to restrain behavior that could inflict harm on others, including distant strangers (Smith & Pangsapa, 2008, p.9).

Smith & Pangsapa (2008) suggest that previous citizenship literature was focused on a community's rights and entitlements and often failed to capitalize on duties and obligations. However, as globalization expands former state-centric communities, citizenship discourse is expanding to include obligations for a global community (p.13). Most recently, scholars are capitalizing on the opportunity civic obligations have to strengthen pro-environmental behavior by espousing the obligations and rights of citizenship and environmental justice theories. Thus environmental citizenship defined in broad strokes, is assimilating notions of obligations and duties that are typically tied to (state-centric) citizenship theories, in order to promote positive environmental attitudes and behaviors (Dobson, 2006, p.1).

Dobson was not the first to suggest citizenship language should be used to articulate environmental obligations. Aldo Leopold (1949) similarly defined the biotic citizen as someone who acts as a responsible member of a socio-ecological system.

The biotic citizen exhibits a certain moderation, intellectual humility, open disposition, and engagement that emerges from his/her interaction with the wider biotic community and 'harmony with the land' becomes an ideal on par with justice and liberty toward which citizen strive (Leopold, 1949; as cited in Cawley & Gabrielson, 2010, p.609).

Since Leopold's biotic citizenship, several variations of eco-citizenship have emerged in scholastic literature. Mostly the variations occur in the establishment of citizen's roles and the nature of their obligation. Agyeman and Angus (2003) define two "focuses" of eco-citizenship: narrow focused and broad focused citizenship. In **Table 1**, the central facets are compared. The narrow focus of citizenship considers environmentalism from a top down reformist perspective. Whereas, the broad

focus proposes a transformative approach in order to promote a paradigm shift. The narrow focus implies a passive citizenship, centered on rights, and social capital that is contingent upon access to the regulatory and public arenas. A broad focus requires an actively engaged citizen that is focused on responsibilities to social and economic health, which is directly and positively correlated to social capital (Agyeman & Angus, 2003). The broad interpretation utilizes environmental ethics: justice and virtue. It is important to note the reformative approach of the narrow focus compared to the transformative measure of the broad perspective (Agyeman & Angus, 2003).

Table 1: Narrow and Broad Focus Civic Environmentalism

	“Narrow Focus” Civic Environmentalism	“Broad Focus” Civic Environmentalism
Main Contributors	John (1994); EPA (1997); Saber et al. (1999); Friedland & Sirianni (1955); Landy et al. (1999)	Shutkin (2000); Roseland (1998); Hempel (1999); Mazmanian & Kraft (1999)
Central Premise	Stresses limits of top –down command and control environmental regulation. Civic environmentalist policies are best suited to dealing with the local nature of contemporary problems.	Stresses interdependent nature of environmental, social, political, and economic problems. Civic environmentalism is fundamentally about ensuring the quality and sustainability of communities.
Central Focus	The focus is on the interconnected nature of <i>environmental</i> problems. Using an ecosystem focus, the argument is that environmental problems do not correspond to political boundaries.	The focus is on the connections between <i>environmental, economic, and social issues</i> such as urban disinvestment, racial segregation, unemployment, and civic disengagement.
Contribution to Sustainable Communities	Can only help achieve the <i>environmental</i> goals of a sustainable community, namely to <i>protect and enhance the environment</i> e.g., pollution control, protection of biodiversity, etc.	Can only help to <i>protect and enhance the environment, while meeting social needs and promoting economic success</i> i.e., meets all the goals of a sustainable community.
Nature of Change	<i>Technical, reformist.</i> Policy change to incorporate community perspectives.	<i>Political, transformative.</i> Change requires a paradigm shift.
On the Role of Citizen	<i>Passive Citizenship</i> , focus on <i>rights</i> of	<i>Active citizenship</i> , focus on

	“Narrow Focus” Civic Environmentalism	“Broad Focus” Civic Environmentalism
	citizen access to legislative and judicial procedures, community right to know laws	<i>responsibilities</i> of the citizen to the environmental, social, and economic health of the community.
Role of Social Capital	Builds social capital as citizens gain access to the regulatory and public interest arena. But “narrow focus” precludes broader conception of and growth of social capital because of unrepresentative nature of local environmental action.	Environmental, economic, and social decline mirrors decline of social capital. Increasing social capital and networks of social capital is essential for developing sustainable communities.
Stance on Environmental Justice	Environmental injustice is mostly related to lack of access to and protection from, public policy. The primary focus is on <i>procedural justice</i> .	Environmental injustice is a result and cause of social, economic and racial inequity. The focus is on both <i>procedural and substantive justice</i> .

Source: Agyeman and Angus, 2003, p.353

Andrew Dobson (2003) also distinguishes between different forms of citizenship. In **Table 2**, there are three different structural outlines for citizenship: liberal, civic republican, and post-cosmopolitan. The liberal and civic republican types are both created out of a territorial obligation. Civic republican environmental citizenship is reliant on a foundation in duties and obligation, which in turn confines it to a masculine set of virtues. The liberal conception emphasizes rights and entitlements that are created in a territory where traditional virtue is rejected (Dobson, 2003; 2006; Smith and Pangsapa, 2008). As this thesis details in the next section, it is in the post cosmopolitan state that a non-territorial virtue emerges. This raises several questions on the need for contractual reciprocity and it embraces a deeper set of feminine virtues of care that acknowledge citizen obligations are both private and public. Traditional masculine virtues are rooted in military discipline and statecraft and emphasize the virtues of courage, devotion, leadership, and sacrifice. Whereas, feminine virtues emphasize citizen to citizen relations and the ethics of care such as nurturing, responsibility, and compassion (Dobson, 2006).

Table 2: Three Types of Citizenship

Liberal	Civic Republican	Post – Cosmopolitan
Rights/ Entitlements (Contractual)	Duties / Responsibilities (Contractual)	Duties/Responsibilities (Non-contractual)
Public Sphere	Public Sphere	Public And Private Sphere
Virtue – Free	‘Masculine Virtue ‘	‘ Feminine Virtue’
Territorial (Discriminatory)	Territorial (Discriminatory)	Non- Territorial (Nondiscriminatory)

Source: Dobson, 2003, p.39

Dobson uses this table to outline two understandings for green citizenship: environmental citizenship and ecological citizenship. Dobson’s “environmental citizenship” is merely the extension of liberal rights to the access of environmental goods (or the prevention of environmental bads). Environmental Citizenship and the Narrow Focus of Civic Environmentalism are similar in that they rely on procedural justice, contractual relations and the fail to account for the transformative potential social capital provides. (Dobson, 2003; 2006; Smith and Pangsapa, 2008).

However, it is Dobson’s conception of ecological citizenship that is of interest, since by definition it is transformative and is developed in the post-cosmopolitan setting identified in Table 1. Several similarities exist between Dobson’s ecological citizenship and Agyman’s broad focus of environmentalism. Ecological citizenship is reliant on ethics and a paradigm shift that prioritizes human welfare and happiness. Additionally, it promotes a non – contractual responsibility that is based on virtues and ethics. Dobson outlines a citizen’s primary virtue is the commitment to international and intergenerational equity of resources. All other virtues are secondary and should uphold the primary virtue. Ecological citizenship stresses a strong foundation in justice and transcends conventional thoughts of space and time.

Although, the terms may be used interchangeably, it is Dobson's definition of ecological citizenship that is the intention for this paper. Ecological citizenship suggests the development of a new political space through a cosmopolitan (or later a post-cosmopolitan) perspective. Dobson (2003) proposes it is important to understand the asymmetrical, harmful action of a globalized world leads to a post-cosmopolitan setting. It is this post-cosmopolitanism that furthers the crucial concept of obligations to a global community. It is the same asymmetrical inequalities that make theories for justice possible (Dobson, 2003; Bell & Dobson, 2006).

Post-Cosmopolitan Citizenship

Ecological citizenship becomes applicable in a post-cosmopolitan world. Ecological citizenship emphasizes the importance of virtues and justice. Here, justice is loosely defined as access to environmental goods and the prevention of environmental bads (Dobson, 2003; Dobson, 2006; Smith & Pangsapa, 2008, p.76). There is an important distinction to note between cosmopolitan citizenship and post-cosmopolitan citizenship. Cosmopolitan citizenship is based on virtue by expanding traditional territories to an imagined territory much larger than the political nation-state. In a new imagined territory, rights are now recognized for a "common humanity". In a sense a cosmopolitan setting matures into a post-cosmopolitan setting. With a post-cosmopolitan setting, obligations are based on justice and a community of recognized citizens. Post-cosmopolitan citizenship furthers the notion of a global community. Within a global community, material relationships with other citizens are created in both resource allocation and pollution. In this space, globalized harmful material relationships between citizens are exposed and environmental injustice is recognized. In a post-cosmopolitan setting, the obligations of an active citizen are expanded to include the natural world and to transcend nation-state boundaries based on a duties of equity and justice in the global community (Dobson, 2003; Dobson, 2006; Smith & Pangsapa, 2008, p.76).

Similar to Dobson, Ulrich Beck (1999) proposes, that globalization of economies has left societies vulnerable and calls for an ‘earth politics.’ According to Beck, the “me-first generation” is moral and political in a different manner than previous generations (Beck, 1999, p.9). Traditional civic obligations are being replaced with an obligation to promote humanitarian rights. Beck suggests a renewed emphasis on the moral issues of natural resources, human rights, and climate change. Such issues like these must be approached as both global and local concerns. Beck refers to such concerns as “glocal issues”. Glocal issues call for a joint political discourse where they can be addressed in a transnational setting. Similarly, Jelin (2000) proposes that economic interests and international communications strengthen local interactions as well as transnational relationships. This implies a “glocal citizenship” is necessary to accurately respond to community needs (p.47).

As we will examine in depth in this thesis, ecological citizenship transcends traditional viewpoints of citizenship and cosmopolitanism by expanding the virtue and community of justice to include international and intergenerational equity. Environmental obligations and the duties that are associated with preserving a “common humanity”, strengthen the obligation to sustainability for both environmental and anthropocentric purposes (Dobson, 2006).

Defining Sustainability

This section identifies the contradictions and variations among sustainability and defines sustainability for the intentions of this research. The Brundtland Report proposes “The idea of sustainable development calls for satisfying the needs of present generations without compromising the ability of future generations to meet their needs” (WCED, 1987). The goals of sustainable communities are broadly defined as conserving natural resources while meeting social needs, and promoting economic success (Agyeman & Angus, 2003, p.347).

Thus, sustainable development requires the promotion of economic opportunities while ensuring such development is managed in a way that it does not endanger the viability for future generations to thrive. The type of socio-political change that sustainability calls for is a difficult transformation from the deeply embedded consumption patterns, cultural habits and norms of our society (Fernand, 2003).

Andrew Dobson further elaborates on the definitions of sustainability .In his book, *Justice and the Environment*, Andrew Dobson defines three major conceptions of sustainability (1998). The three conceptions and their prioritizes are compared in Table 3.

Table 3: Dobson’s Conceptions of Sustainability

Conceptions of Environmental Sustainability			
What to sustain?	Critical Natural Capital (A)	Irreversible Nature (B)	Natural Value (C)
Why?	Human Welfare	Human Welfare and Duties to Nature	Duties to Nature
How?	Renewing/substituting /protecting	Substituting/ Protecting	Protecting
Objects of Concern	ABCD EF	AE, BF, CD	EA, FB, CD
Substitutability between human-made and natural capital	Not always possible between human-made capital and critical natural capital	Not always possible between human-made capital and irreversible nature	Eschews the substitutability debate
A = Present generation human needs B = Future generation human needs C= Present generation human wants D= Future Generation human wants E=Present generation non-human needs F=Future generation non- human needs			

Source: Dobson, 1995, p.39

Conception A – Preserving Critical Natural Capital

In Conception A, environmental conservation is pursued for the continuation of human prosperity. Conception A is concerned with preserving only the capital that is essential to the reproduction of human life – critical capital. This conception emphasizes the ingenuity of human intelligence and technology to provide substitutes for natural capital. This conception does not concern itself with the intrinsic value of nature or the consequences of irreversible damage to nature (Dobson, 1995, p.38).

Conception B – Irreversibility Conception

The second conception is the “middle path” meaning it is not completely anthropocentric nor is it entirely devoted to intrinsic value. Irreversible sustainability is positioned as preserving the natural capital and preventing permanent damage to biodiversity that cannot be rectified. The pursuit of sustainability is founded on international and intergenerational concerns for justice, human welfare, and partly for nature’s own intrinsic value. It is similar to Conception A in the sense that the motives for sustainability are intended to further human welfare. However, this conception realizes the intrinsic value of nature. It recognizes that irreversible changes in the environment are a significant loss, specifically to future generations. The irreversibility conception also recognizes that some human impact on nature is unavoidable, but maintaining biodiversity and minimizing pollutants is imperative obligation to current and future generations (Dobson, 1995, p.38).

Conception C – Natural Value

This conception is for “deep ecologists” who believe all resources, ecosystem, and natural capital have an intrinsic value that should be preserved and maintained as it is found today. This does not stem from a concern for future generations or international equity, but rather the belief that all

beings and ecological systems are of great value and have a right to life (Dobson, 1995, p.38). In Conception C obligations to humanity are not prioritized.

It is important to note that not all views of sustainability are *environmental*. For instance, Conception A more closely resembles the term “sustainable development” and it supports the idea of economic growth at the great cost of biodiversity and environmental integrity. Whereas, Conception C precludes human welfare as a valuable part of a sustainable community. When discussing the intentions of sustainability, it is important to acknowledge the idiosyncratic qualities between environmental sustainability, sustainable development, and the important role of social justice (Dobson, 1995, p.61). Recall, ecological citizenship is reliant upon equity and justice across space and time and values a “common humanity.” Thus, for defining the pursuit of sustainability for ecological citizens, this thesis assumes the general principles outlined in Conception B. Using Conception B, environmental obligations and duties can be associated with preserving a “global community” by strengthening the obligation to sustainability for both environmental and human purposes (Dobson, 2006).

Accepting that sustainability and equity are natural obligations for an ecological citizen, how would an eco-citizen measure the sustainability of Pacific Salmon consumption? As I mentioned earlier, sustainability definitions are ambiguous and obtuse. Dobson suggests the ecological footprint is a reasonable method for evaluating sustainability in a process, community, industry, or a given population. Ecological footprint is defined as the land and water area that is required to support a defined human population and material standard indefinitely (Rees & Wackernagel, 1996). Dobson acknowledges the difficulty of measuring the ecological footprint, but believes the basic idea and environmental impact behind the measurement is still evident (Dobson, 2003, p. 99). Dobson adopts the term but leaves out “indefinitely” from his definition, as it complicates an already

intricate measurement. “The ecological footprint becomes a time-slice indicator of a human community’s metabolic relationship with the goods and services provided by its natural environment.” (Dobson, 2003, p.100) For instance, ecological footprint is a natural accounting tool that would consider the environmental impact of a single meal for the products entire life cycle (i.e., the land and energy used to raise the livestock and crops, and to transport and consume a single meal). Ecological footprint calculates the land, energy, and resources consumed in global hectares per capita. The footprint can be calculated individually or for a population (Dobson 2003; Oosterveer & Sonnenfeld, 2012, Rees & Wackernagel, 1996).

Dobson proposes that in the public and private spheres, an ecological citizen must be in constant pursuit of trying to minimize his own ecological footprint throughout his daily life. While there are currently not any examples of eco-labels indicating an ecological footprint for Pacific Salmon products in the U.S., ecological footprint does provide a framework for evaluating the sustainability methods for existing eco-labels.

Closing the Gap: Citizenship and Sustainability

Knowledge, values and behaviors are central focal points to any discussion of sustainability. Recognizing that sustainable communities are reliant on pro-environmental behavior, there is extensive literature on the formation of knowledge and values and how they contribute to behavior. Research on values can be found across disciplines and is often a tedious categorization of perspectives and elaborate methods for projecting how these values will determine behavior. A consensus in existing literature identifies an empirical gap between pro-environmental values and the translation of these values into behaviors (Agyeman & Kollmuss, 2002; Dietz, Fitzgerald & Shwom, 2005; Leiserowitz, Kates, and Parris, 2006). For instance Leiserowitz, Kates, and Parris (2006) conducted a lengthy qualitative and empirical research that determined how pro environmental

values and backgrounds can progress into normative behaviors. Based on an extensive mapping strategy that traced the progression of environmental values to behavior, they concluded many people may prescribe to environmental values and the pursuit of sustainable communities. Unfortunately, the pursuit of sustainability falls flat when values often fail to progress into established behaviors (Leiserowitz, Kates, & Parris, 2006). The understanding of how values progress into behavior has improved. In the 1970's very simple linear models, like Figure 1, were used to illustrate a direct connection between knowledge, values, behaviors, and norms. These models proved inaccurate in empirical finding when scholars realized that knowledge did not necessarily generate a behavior pattern. Modern behavior scholars recognize that a complex network of barriers and obstacles exist in the formation of knowledge, values, and behavior models. In Figure 2, Dietz, Fitzgerald, & Shwam, (2005) illustrates how values translate into beliefs which in turn create norms in the VBN theory.

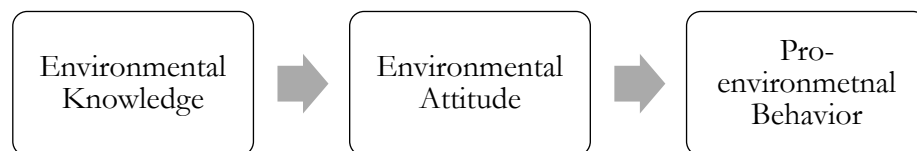


Figure 1: Past Linear Models for Value and Behavior

Source: Agyeman & Kollmuss, 2002, p.241

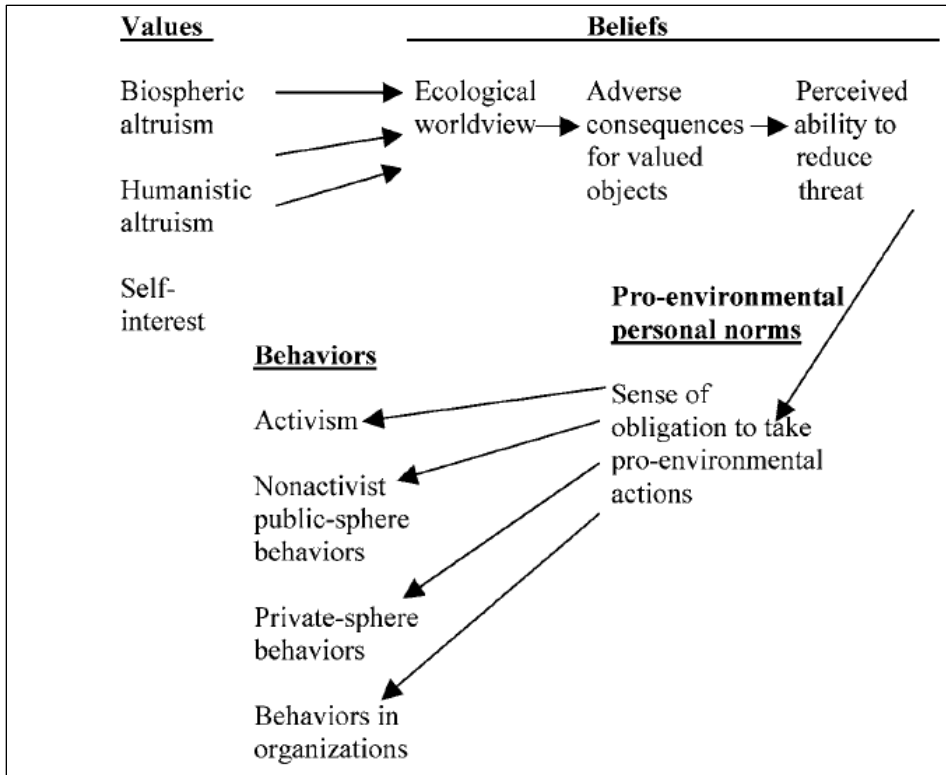


Figure 2: Values, Beliefs, Norms (VBN) Theory

Source: Dietz, T., Fitzgerald, A. & Shwam, R. 2005, p. 357

From the comparison, we can see that as behavior studies intensify, so do the factors which contribute to pro-environmental behavior. The VBN theory accounts for several values that can lead to pro-environmental norms. The VBN theory similarly recognizes that action can take several forms. Agyeman and Kollmuss, similarly examine past pro-environmental behavior models to build an extensive list of internal and external factors, and outside barriers that may hinder pro-environmental behavior. Their extensive model recognizes emotional non-investment, education, social, cultural and economic situations and factors in determining your adoption of pro-environmental behavior.

We see environmental knowledge, values, and attitudes together with emotional involvement as making up a complex we call 'pro-environmental consciousness'. This complex in turn is embedded in broader personal values and shaped by personality traits and other internal as well as external factors (Agyeman & Kollmuss, 2002, p. 257)

Agyeman and Kollmuss's research essentially weakens the transcendent power of environmental awareness in the absence of individual accountability and the democratic process (Agyeman & Kollmuss, 2002, p.257). Leiserowitz et al. (2006) similarly, proposes eliminating the individual barriers (e.g., time, money, access, and knowledge) and also the structural barriers (laws, regulations, and social norms) citizens will be able to prioritize their time and energy toward their environmental values. In addition to barriers, Leiserowitz et al. (2006) calls for accelerating action and choosing values in order to capitalize on pro-environmental behavior. Accelerating action will directly compensate a citizen for their efforts, create urgency, and avoid the disinterest that comes from setting long-term and often unattainable goals. Lastly the authors offer finding ways to aid citizens in prioritizing values and eliminating individual and structural barriers so that environmental behavior can be freely pursued (Leiserowitz et al, 2006).

From this we can conclude that if environmental citizenship is to be an effective mechanism for moving forward, then it must take the existing values and translate them into the appropriate attitudes and behavior on both the individual and collective levels. If we are to position environmental citizenship to achieve this, then we must provide a system that educates environmental citizens, in a manner that accelerates action, bridges individual and collective barriers, and enables the citizen to prioritize environmental values (Agyeman & Kollmuss, 2002; Dietz, Fitzgerald & Shwom, 2005; Leiserowitz, Kates, and Parris, 2006).

Environmental education, like environmental values, provides necessary but insufficient conditions for demonstrating pro-environmental behavior. Dobson recognizes the importance of education to cultivate citizenship. He suggests mandatory citizenship courses as a viable option for developing citizen virtue. At the same time he recognizes that teaching the values of environmental citizenship may conflict with neutral value principals of liberalism. However he maintains, the importance of identity and norms are nurtured through formal education and debate (Dobson, 2003, p.210-211).

Historically, Aldo Leopold argues against creating a uniform, systematic approach to environmental education for fear that it would be ineffective. Leopold argues that without personalized experience, a formal education would fall flat and prove ineffective (Leopold, 1949; as cited in Cawley & Gabrielson, 2010, p. 607). Similarly, Agyeman and Angus suggest educational environmental awareness programs will not close the value-action gap and would fail at any attempts to engage citizens in a transformative social movement. Like, Leopold, Agyeman and Angus call for the learning of social capital and a renewed sense of civic engagement. They propose it is only this type of education that will engage and inspire citizens to a sustainable social movement (Agyeman & Angus, 2003).

Additionally, the attitude and behavior gap has important implications for sustainability policies as well. Governing polices developed for the intention of sustainability, must also recognize the gap between environmental attitude and behavior. In order for sustainable policies to be effective, the focus must be on changing behaviors rather than trying to alter attitudes (Bell and Dobson, 2006, p.4).

The European Union has suggested a renewed political intention for facilitating sustainable development by approving a range of various policy initiatives. In an internal report, *European Governance – A White Paper*, the Commission recognizes the impact that rapid globalization has had

on the democracy and thwarted several policy efforts (Agyeman & Evans, 2003; EU Commission, 2001). In an effort to simultaneously address the erosion of democracy and to develop meaningful sustainable policy, the white paper suggests restoring faith in democracy and increasing citizen's engagement. The paper proposes including the following overarching five principles in all local and global policy: openness, participation, accountability, effectiveness and coherence (EU Commission, 2001).

Additionally, Agyeman and Evans (2003) point out the importance of public participation in environmental policy-making. "The emphasis on improving democratic mechanisms for decision making leads to calls for human equity and environmental justice, more effective environmental governance and greater environmental democracy." (p.194) Agyeman and Evans promote the rights to environmental information, decision-making, and the means for environmental justice is needed to engage citizens. Agyeman and Evans further intensify the need for democratic political participation by citing that the implications of Putnam's work on the erosion of social capital. Agyeman and Evans propose this erosion of social capital would devastate any intention for a social sustainability movement (Agyeman & Evans, 2003, p.194; Putnam, 1995).

In addition to equity and democracy, Oosterveer and Sonnenfeld (2012) also call for sustainable policies that incorporate the precautionary principles and the integration of policies at all governmental levels. As a result of globalization, sustainability has become an issue for the entire food supply chain. In order to further the discussion on sustainability, a united effort toward minimizing the environmental impact must be implemented across the board (p.42).

Merging Sustainable Consumerism and Eco Citizenship

While it may seem paradoxical, sustainable and ethical consumerism is viewed as an indicator of pro-environmental behavior.

Sustainable consumption is implicitly defined as the consumption of more efficiently produced goods, and the 'green' and or 'ethical' consumer is the driving force of market transformation, incorporating both social and environmental concerns when making purchasing decisions. (Seyfang, 2005, p.294)

Sustainable consumption is reliant on consumers who have the knowledge of environmental consequences and the motivation and opportunity to act on that knowledge. Seyfang argues by requiring individuals to make political and environmental choices in their consumption patterns, individuals are utilizing an important tool for ecological citizenship (Seyfang, 2005, p. 294). Essentially, Seyfang's sustainable consumer is a call for ecological citizens who demonstrate an obligation to responsible buying behavior.

Seyfang (2005) outlines two approaches to sustainable consumerism. One is a "mainstream" approach that essentially cleans up production processes and eliminates wasteful and toxic pollutants. The other is defined as a "radical" approach and essentially requires an overhaul to the current thinking of material consumption and affluence. In both of these approaches, the actor of change is the individual consumer (p. 292). Seyfang (2005) compares the mainstream and radical approaches of sustainable consumption as a tool for eco-citizens. The author concludes that due to several institutional barriers of mainstream sustainability methods, including lack of information and inefficient tools of measurement, mainstream sustainable consumption is not an effective tool for eco-citizens (p.297).

Iles (2004) is critical of the current more "mainstream approaches" that have no transformative potential. In his article, *Merging Consumption and Citizenship in the United States*, Iles discussed the effectiveness of consumer driven environmental seafood campaigns like the Monterey Bay Sea Watch and the Seafood Alliance. "American environmental groups have, in effect pursued the

strategy of merging citizenship with consumption by asking consumers to take on the role of politically engaged citizens through their purses” (p.127). Iles (2004) argues that environmental campaign organizers are now using different tactics. Where campaigns originally advocated for the abstinence of products altogether, they are now suggesting moderation in buying behavior by relying on educated consumer models and political/environmental obligation. As we will see later, these consumer campaigns provide easy to understand, science - based sustainable ratings for individual fish species. It is the intention that these ratings will act as a guide for eco-citizens. Iles argues that the successes of these campaigns are directly correlated to the ability for campaigns to effectively create a community of ecological citizens.

According to the existing research, sustainable consumption can only be an efficient tool for eco-citizens if it employs a more “radical” approach towards transforming consumption patterns. Seyfang suggests changing the way in which development is understood and redefine “well-being.” “Ecological citizens should challenge the commercial, political, and legal forces which currently favor commodification, to produce instead locally significant social economies, where collective ownership and co-production take precedence” (Seyfang, 2005, p.300). Seyfang proposes a couple of examples for achieving radical transformation; He suggests eliminating unnecessary global travel from the food supply chains and determining new forms of currency and value to exchange products locally (Seyfang,2005).

Iles relies on citizenship theories from TH Marshall (1950), a sociologist in a post-war Britain, and Engin Isin (2002), a Canadian political scientist. According to Marshall and Isin several factors contribute to the meaning of citizenship. Iles argues that in order for sustainable consumption to be used as a valuable tool for eco-citizenship or vice versa, the following principals should be evaluated.

- (1) Citizenship is strongly tied to the meanings of rights and obligations. While rights do not

necessarily translate into abilities, however the right to participate does depend on the ability to be educated. The government in this situation is given the role of facilitating discussion and enabling access, ability and nurturing such discourses. Private actors (NGO's, charities, and companies) can also take on a similar role. (2) Citizens define themselves as belonging to a group or against another group or actor. It is important for this sense of community to be where either community directly allows them to enjoy in such rights, struggle to win such rights, to actively engage in bargaining and/or feel as a part of a virtuous and loyal community. (3) The boundaries of the imagined community may further define the community of citizens. Why is a community imagined? – Most often the members of the community cannot personally know one another, but by creating the imagined boundaries of community, the members will feel united by their political agendas. (4) Education is a prerequisite for citizenship. “Citizens need, and have a right to, information to be politically engaged. Concurrently, they may have an obligation to inform themselves adequately” (Iles, 2004, p.129). (5) Citizenship needs to be viewed as a dynamic social relationship. Such a relationship must be reliant on the ongoing politics of a specific time and place and reflect the concerns of the community. (6) Finally, the efficiency of the terms (methods and institutes) on which citizenship is cultivated is also significant to the success of the community (Iles, 2004).

Summary

As we examine in depth in this thesis, ecological citizenship transcends traditional viewpoints of citizenship and cosmopolitanism by expanding the virtue and community of environmental injustice to include international and intergenerational equity. Environmental obligations and duties are then associated with preserving a “global community” by strengthening the obligation to sustainability for both environmental and anthropocentric purposes (Dobson, 2006). Prior research has positioned this theory to close the empirical gaps in environmental values, attitudes, and behavior models.

Smith and Pangsapa (2008) point out that various conceptions of citizenship highlight the importance of both public and private spheres, and citizenship should not be understood as an attempt to shift this burden to the individual level.

With the limited capacities of states to make a difference, and with most problems, especially environmental problems, demanding clear transnational responses, personal decisions need to be linked to environmental responsibilities in ways that are more effective than intergovernmental policies and treaties. This is not a justification for states to privatize environmental responsibility – shifting the burden on to citizens and away from political authorities.the idea of a cosmopolitan citizenship will create space for partnerships between institutions and citizens, but also point to the more dynamic and varied conceptions of citizenships that are yet to come into being. Ecological citizenship is part of a new generation of kinds of citizenship that take the politics of obligation seriously (Smith & Pangsapa, 2008, p.9).

The connection between ecological citizenship and sustainability is fairly easy to identify; the parallels are depicted in the language of the definitions presented in this paper. It is evident that ecological citizenship is inherently connected to the virtues of sustainability (conception b). Sustainable consumption is emerging as an expression of green citizenship. Sustainability measurements for a population or product should reflect the life-cycle of the product.

Moving forward into our case study, it is important to remember the following about ecological citizenship. Ecological citizenship is developed in a post-cosmopolitan setting where asymmetrical material injustices are exposed. As a result, asymmetrical obligations (public and private) emerge. Consequently, a respective, asymmetrical obligation to equity and fairness develops, and this obligation transcends space and time.

From this literature review, one can see ecological citizenship is a multi-faceted theoretical foundation, where both public and private participation is necessary. Education and awareness are necessary but not sufficient conditions for environmental citizenship. Developing a community of citizens is crucial to any sort of citizenship discussion. Citizenship and sustainability should be understood as fluidly dynamic definition. As a result programs should reflect the ability to represent versatility. In order for governance methods to facilitate eco-citizenship it should include deliberation, democratic discourse, the use of the precautionary principles and policies should be aimed at creating transparency and encouraging social capital. Moving forward, it is important to remember that in order for sustainable consumption and ecological citizenship to provide conducive conditions for pro-environmental behavior; sustainable consumption must be transformative in nature and eliminate barriers for citizens to fulfill their obligations.

CHAPTER THREE: RESEARCH METHODOLOGY

Methodology

How should we measure the opportunities for ecological citizens to engage in sustainable consumerism in the fish industry? I use an instrumental case study to understanding the various concerns that an eco-citizens may consider if trying to purchase Pacific Salmon sustainably. I specifically chose Pacific Salmon from the MBA Seafood Aquarium since it is in high demand in around the globe, and is rated green - “best choice” or “good alternative”. Pacific Salmon offers a valuable example of the impact of informed decisions making, and how institutional barriers may lead to inaccurate sustainability rankings (MBA, 2011).

Recall, ecological citizenship is based on the virtue of justice, equity, a conscientious effort to minimize one’s own ecological footprint, and participation in cooperative governance (Agyeman & Evans 2003; Dobson 2003; Smith & Pangsapa 2008). Given this, I measure the opportunity for eco-citizens, to engage in sustainable consumption by evaluating the following items for the Pacific Salmon that is available in the US market:

- (1) The quality and accessibility of information concerning the fish product’s source (e.g., a product’s ecological footprint, life cycle, and/or food miles) and the effectiveness in nurturing ecological citizenship
- 2) The structure and transparency of governing entities in a convoluted, globalized market.
- (3) The transparency and effectiveness of food retailers’ sustainable fish policies and their mechanisms for communicating the source information regarding their fish products

Why use the global fish trade to illustrate the opportunities and limitations for ecological citizenship?

The global infrastructure of the food industry in itself is a fascinating case study. It is layered with

various forms of social, economic, and resource injustices all the while being closely intertwined with cultural identity.

Recall, increases in population, the growing prosperity of developing countries, in combination with global climate change create imperative challenges to resource and food scarcity (Brown,2011).

Oosterveer and Sonnenfeld (2012) suggest these environmental complexities converge in the globally traded fish market. Fish currently makes up more than 35 percent of the total animal protein supply. The fish market has been directly impacted by the growing prosperity and changing diets of Asia; especially in China, where the consumption of fish products are a part of their cultural identity. In 2007 an overwhelming 91% of aquaculture production went to Asia (Tacon, 2010).

Global fish trade has several actors all the while being dependent on local ecological health and climate conditions. Depleting fish stocks and the pollution of aquaculture farms are valid and increasingly great obstacles to the sustainable production of fish product (Oosterveer & Sonnenfeld, 2012 p.153).

Specifically, the fishing industry is of particular interest in conceptualizing environmental citizenship for several reasons: For one, it is a ubiquitous global infrastructure where harmful material relationships are evident. “The realities of global fish trade and local fisheries are inextricably and irreversibly bound together through dynamic relationships in global flows of fish.” (Oosterveer & Sonnenfeld, 2012 p.153) These complicated folds of injustice are particularly useful for the application of ecological citizenship since the eco-citizen theory is rooted in the virtue of justice. This harmful global relationship combined with the sheer magnitude of the fish industries’ ecological footprint makes this a compelling and valuable case study to apply Dobson’s theories.

Case Study Approach

I use an instrumental case study of Salmon produce in the US market to illustrate barriers that eco-citizens may encounter when attempting to sustainably consume fish products. In the following case study, I outline the various origins for Pacific Salmon in the US market; then I examine the role of three facets that influence ecological citizens in pursuing sustainable Salmon: eco-labeling, retailer and governing policies.

First, I evaluate how sustainability is measured and communicated on packaging using eco-labels. Eco-labels are intended to be indicative of the fish's source and provide a means of measuring sustainability. I compare the two very different but prominent sustainability labels, the Marine Stewardship Council (MSC) and the Monterey Bay Aquarium (MBA) Seafood Watch. MSC is understood globally as upholding standards for sustainable fisheries and is one of the most widely used eco-labels. MBS Seafood Watch is a tool for evaluating safe and sustainable fish species. I evaluate the level of transparency these labels have regarding their methods. Additionally, I intend to draw conclusions on the ease and accessibility of the labeling schemes and the overall effectiveness of the consumer driven campaign on nurturing ecological citizenship. Secondly, I compare the presence of sustainable fish products and policy in the grocery stores – Whole Foods and Publix. Both retail stores boast that their policies for selecting fish products reflect a commitment to the health of the customers and low impact principals. As we discuss later, I chose these stores for their very different methods in pursuing sustainable fish products. Whole Foods is a specialty store carrying premium organic produce and products. Their marketing initiatives claim all of their products reflect their concern for social equity and environmental responsibility. Whereas, Publix is a larger chain located throughout the Southeast and they offer both mainstream food products and their own line of organic food products. Lastly, I examine the governing agencies of US Pacific

Salmon fisheries and shed light on the effectiveness of overlapping and convoluted regulating practices.

In order to understand, our third empiric, the efficiency of governing entities and the barriers for eco-citizens to engage in the market, we must understand how does unsustainable fish even reach our grocery stores? I intend to examine the regulating entities of US Pacific Salmon. This allows me to draw a deeper understanding of the barriers eco-citizens experience in the Pacific Salmon market and how these current mechanisms restrain the rights for ecological citizens to pursue their beliefs in sustainable consumption.

Limitations

This case study is a qualitative examination of how the theoretical propositions offered by ecological citizenship may be conceptualized in the fishing industry, thus it relies on the existing research to divulge new findings. This research does not discuss the literature that contests the theoretical premises of Dobson's ecological citizenship. There is a great opportunity for quantitative study concerning the attitudes, values, and behavior of ecological citizens and their relation to sustainable consumerism; that is not the focus of this study and is not included. While there are merits in the existing works, that contest the labeling schemes from the MSC and the MBA, that discussion is not the purpose of this thesis. The focus of this study is to provide a qualitative examination of the transparency and availability for an ecological citizen to exercise their rights and duties for responsible consumption in a globalized and convoluted regulating system.

Furthermore, there are some technical limitations to the case study. The conclusions drawn from the comparison of Publix and Whole Foods are limited to the geographical proximities where the stores exist. Whole Foods is a growing presence throughout the US where Publix stores are mostly found in the Southeast.

While Salmon is a very prominent fish in our supermarkets, it is not the only fish available for consumption. This study is limited to Pacific Salmon and because of the intricacies of sustainability ratings, my conclusions can only reflect the Salmon industry and can only raise similar research questions for other seafood species. Additionally, this study does not take into consideration the purchasing principles for sustainable seafood in restaurants and uses the term producers to draw inferences on neighborhood supermarkets.

Assumptions

In order for theories of environmental justice to be applicable and the discussion of sustainability to be valid, we must first accept scarcity and the resulting dynamics that asymmetrical globalization produces. For the purpose of this thesis we will accept the following views of scarcity, global climate change, and the possible repercussions. (1) The resources of the world are both finite and are rapidly approaching their sustainable limit (e.g., the renewable resources needed to sustain future generations) (Smith & Pangsapa 2008; Dobson 1998; Meadows et al. 2004). (2) Global climate change is likely to exacerbate the existing food shortages and push humanity beyond the tipping point of the earth's sustainable limits. (3) The anthropogenic impact on the planet's ecosystem is not distributed equally among income groups, political and geographical boundaries, natural organisms and/ or future generations (Smith & Pangsapa 2008; Dobson 1998; Meadows 2004). (4) A socio-political paradigm shift is needed to address the asymmetrical allocation of this impact. This is a prerequisite to any discussion on sustainability (Meadows et al., 2004).

CHAPTER FOUR: CASE STUDY

Salmon and Sustainability

This chapter reviews the various options consumers have for choosing Pacific Salmon. As you will see, choosing sustainable Pacific Salmon is complicated by several factors including: the sustainability factors connected to the source, the sheer size of a globalized market, the resulting failure to provide clear and transparent source information, and convoluted regulation practices.

This section discusses the nutritional and environmental implications of farmed salmon, hatcheries and wild-salmon. By identifying the complexities of the salmon species and the implications of farmed salmon source, we will be able to understand the importance of consumer buying decisions and hence the importance of eco-labeling.

Pacific Salmon rely on cold water with high oxygen content and they have an excellent predatory metabolism (Greenberg, 2010). Pacific Salmon are anadromous migrating fish, meaning they are born in freshwater streams and travel to saltwater oceans. As juveniles, Salmon travel toward saltwater sources while undergoing several physiological changes in order to adjust to saltwater. In saltwater, Salmon reach sexual maturity and then travel back to the original freshwater birthplace to spawn. Salmon travel sometimes thousands of miles to return to their original freshwater birthplace. For reasons unknown, Salmon will not eat after they return to freshwater. Instead they rely on their own storage of fat, making them especially vulnerable. Thus their path to procreate is a lengthy, dangerous and often impossible due to the destruction of habitat (Greenberg, 2010).

Wild Atlantic salmon is a red-listed species (MBA, 2013). Wild Atlantic salmon stocks have been virtually depleted by overfishing and there is no longer any commercial industry for the species. Any commercial use of Atlantic Salmon is almost always farmed salmon. As a result of the decline in

Atlantic Salmon, the demand for wild Pacific Salmon has intensified and now Pacific Salmon species are threatened by overfishing (Greenberg, 2010;).

Pacific Salmon are now extinct in 40 percent in the rivers of California, Oregon, and Washington where they used to spawn in large numbers (Greenberg, 2010). The unique characteristics that make Salmon such a sound nutritional and flavorful choice for consumption are the same characteristics that make it vulnerable and sensitive to overfishing and habitat destruction. “Salmon abundance runs against the gains of industrial revolution.” (Greenberg, 2010, p. 379) Salmon need free flowing, clean, oxygen rich, and timber covered rivers. These needs have been challenged by the industrial development of hydropower plants, agricultural runoff, and logging practices (Greenberg, 2010, location 379).

Farmed Salmon

This section discusses the environmental and nutritional implications of farmed salmon and hatcheries.

In the early 1960's Norwegian Trygve Gjedrem first began applying past breeding logic of cattle and sheep to Salmon. By breeding Salmon from 40 different lakes and streams, they discovered they could essentially create a faster, stronger, more resilient salmon. Most importantly, Gjedrem found he could develop breeds of Salmon that are much less costly to produce in farms. Salmon are natural predators so providing wild fish feed was costly, where 6lbs of wild pellet feed was used to produce 1lb of edible Salmon. Selectively bred salmon require only 3lbs of feed to produce a pound of edible fish. This was a huge development in the Salmon farming industry. By the 1970's Salmon flooded the market and prices plunged. Farmers began producing more and more of the “super salmon” to compensate for low prices (Greenberg, 2010).

Farmed Salmon are genetically altered from years of selective breeding. As a result farmed Salmon have very different characteristics than native wild stocks. There is a risk of farmed salmon escaping open water pens and creating unnatural competition for native wild stocks of Salmon (Greenberg, 2010). In 2004 an estimated half a million farmed salmon escaped from open water pens (Seafood Alliance, 2005). Recent technological improvements in open pens suggest the threat of escaped farmed fish is no longer a major concern. However, the lasting effects of escaped farmed fish on wild fish populations are an important factor to consider when discussing sustainable sources (Greenberg, 2010, location 379).

Aside from displacing wild salmon, salmon farms generate several environmental and health concerns (Seafood Alliance, 2005). Farmed Salmon contains much higher amount of polychlorinated biphenyls (PCBs). According to Greenberg (2010), in the 1960's General Electric was held responsible for discharging over a million pounds of PCBs into the Hudson River. PCBs are a manmade organic chemical that can be found in various products like adhesives, tapes, oil based paints etc. PCBs have been linked to cancer, endocrine disrupting disorders, immune deficiencies, reproductive system failures, and birth defects. Although PCBs have been banned since 1979, they are still present in older products and are not readily disposed of in human and animal tissues. PCBs are especially resilient in fish fat tissues and the foliage that fish feed on. As a result of the discharge, there are resilient levels of PCBs in farmed Salmon (MBA, 2012). PCB's are concentrated in the fatty tissues of Salmon. Farmed Salmon are more vulnerable to PCB's because they have considerable more fat content. Farmed Salmon typically have 15% of fat content. Whereas, wild salmon are leaner and typically have 6% of fat content.

Open sea pens also raise the risk of diseases and parasites in farms. In the wild, risks of sea lice and other parasites are relatively small. However in a confined area with large populations of fish,

parasites can result in lethal epidemics. Additionally, these farms release untreated toxic wastes to the surrounding coastal area. According to the Seafood Alliance, “A single farm with 200,000 salmon can produce as much fecal waste as a city of 62,000 people, all of it untreated and discharged directly into surrounding waters” (Seafood Choice Alliance, 2005, par.7).

Salmon hatcheries have been created in an effort to supplement wild Pacific Salmon. Salmon are bred and hatched in captivity and then released as juveniles. Upon release they are close to two inches in length. Nearly one in three “wild salmon” are originally from a hatchery (Greenberg, 2010, p. 837). This raises a new perspective on invasive species. Salmon juveniles raised in hatcheries are bypassing a significant process of natural selection. As with escaped farmed salmon, hatchery raised salmon are physiologically different. Scientists worry that hatchery-raised-salmon may create competition for wild stocks, spread infectious disease, and/or alter the wild population of Salmon species (Greenberg, 2010; MBA, 2012). Hatchery-raised salmon also skew population counts for wild salmon, since hatchery-raised juveniles are included in the escapement count that determine fishing quotas. The MBA (2012) also warns this may create the invitation to maintain stocks by relying only on hatchery raised Salmon. In turn this could impede on the natural adaptive processes of the fish (MBA, 2012, p.112).

Genetically Modified Salmon

More recently, the development of genetically modified Salmon has raised several questions regarding the future of the salmon industry. In December of 2012, FDA released a statement declaring that after several years of research, that the first genetically engineered animal – kin to Atlantic Salmon – is as “safe” as conventional salmon and does not demonstrate any “significant” impact on the environment (Pollack, 2012). AquaAdvantage® Salmon, developed by AquaBounty, could be on the market as soon as 2013, pending final FDA approvals. AquaAdvantage® is

genetically reconstructed with several other breeds of fish, including ocean pout. The new gene generates a constant increase in growth hormones. As a result, the genetically engineered Salmon grows bigger, faster, and cheaper (Pollack, 2012). Scientists and environmental advocates stress that an accidental release of the GE Salmon into the wild could have severe, caustic effects to the wild salmon stocks. AquaBounty founder, Elliot Entis, proposes that AquaAdvantage® is safer than current salmon farms because there is no risk of AquaAdvantage® being released and threatening wild stocks. AquaAdvantages® are held in inland tanks opposed to open sea pens.

AquaAdvantages® are female and sterile, so that the possibility of reproduction is impossible (Pollack, 2012).

Oosterveer and Sonnenfeld (2012) recognize with the various origins for Pacific Salmon, choosing the most “sustainable” is a complex process.

Contemporary fish provision generates well-known sustainability impacts, such as depleting (or even collapsing) fish stocks and the use of antibiotics in aquaculture, so securing its sustainability has become an evident, although complicated, challenge (Oosterveer & Sonnenfeld, 2012 p.153).

Evidently, eco-citizens must weigh the pros and cons of each source, considering one’s own health and the environmental impact of their consumption choices. As the next section discusses in greater detail, an eco-citizens should also consider several other factors that contribute to the sustainability of Pacific Salmon (or any other wild caught fish) including the impact of fishing equipment, gears, by-catch and how the stock responds to fishing pressure (Roheim, 2009, p.301).

From this, it becomes evident that developing a model for consumers to choose sustainable Pacific Salmon is a delicate and complex process that relies on education, awareness, availability, transparency and most importantly a dedication to the sustainability of sea life. The following

sections assess the obligations that market actors like retailers, producers, and governing agencies have to eco-citizens.

Empowering the Consumer through Sustainability Rankings and Eco Labels

Recent seafood campaigns have asked consumers to purchase sustainably produced and thriving fish species. Essentially, NGOs and producers have collaborated to build labeling and categorical methods that places pressure on the producers. In these campaigns, environmental advocacy groups and NGOs are essentially attempting to change the production process by providing the consumer with targeted and direct information about sustainable fish to eat by examining the fishing practices and whether the production is socially or environmentally damaging. These groups intend to provide educational and accessible scientific information in the form of wallet cards or most recently cell phone apps, in the hopes that they will be able to transform the production process of the fishing industry (Iles, 2004, p.130).

This section takes a look at the MBA Seafood Watch and the Marine Stewardship Council's labeling initiatives. Both programs intend to create systems that will allow eco-citizens to make sustainable choices in their seafood selection. However their methods for determining sustainable fisheries are remarkably different. The Seafood Watch draws science based conclusions on entire fish stocks and determines what fish species are best to eat based on the current conditions of the fish and where and how it is caught. The Seafood Watch does not consider itself an eco-labeling scheme because it does not actually label fishing companies or producers. Instead, the program focuses on making unbiased recommendations for the fish species and the ecosystems where they are caught or farmed. It is then the consumer's responsibility to ask retailers and restaurants the relevant questions to ensure they meet the sustainability criteria (Iles,2004; MBA, 2011). Whereas, the Marine Stewardship Council is considered, by FAO standards, an eco-labeling scheme (Annala et.al, 2010).

Marine Stewardship Council uses a third party company to evaluate the practices of a fishery or an individual company, including the species of fish, how they are caught and how they are produced. If the company is determined to practice “sustainable” methods, then the fishing company and its products are awarded the MSC certificate and are able to use the label on their packaging. This is a voluntary and expensive program for fishing companies, but provides a competitive marketing edge to consumers who have a stake in sustainable consumption (Annala, Goyert, Sagarin, 2010).

In the mid-1990s, several aquariums and environmental advocacy groups, including the Monterey Bay Aquarium, united forces in creating a sustainable seafood campaign targeted at consumers and have been joined by retailers and have formed what is now known as the Seafood Choices Alliance (Iles, 2004; MBA, 2011; Seafood Choices Alliance, 2005).

The Monterey Bay Aquarium (MBA) defines “Sustainable Seafood as a fish or shellfish caught or farmed in ways that can be practiced now and for years to come, without jeopardizing the survival of any species or the integrity of the ecosystem” (MBA, 2005).

The MBA Seafood Watch evaluates the sustainability of both wild-caught and farmed fish stocks found in the U.S. market. The MBA evaluates the regulating bodies at length in the Pacific Salmon Sustainability Report. The report divides the US Pacific Salmon into two categories: Alaskan Pacific Salmon and Washington, California and Oregon Pacific Salmon. Their sustainability criteria are evaluated individually. The rankings are determined by evaluating five *sustainability criteria*: (1) the inherent vulnerability of the stock, (2) the status of the current fish stock, (3) the nature of the bycatch, (4) the effects of fishing on the stock’s habitat and ecosystems, and lastly (5) the management effectiveness. (MBA, 2011, p. 2). Each of the five sustainability criteria is evaluated individually and the conservation concern is determined as low, moderate, high, or critical. The rankings of each species are color coded, (green, yellow, red) and recognized as either a *Best Choice*

(green), *Good Alternative* (yellow), or *Avoid* (red). In order to be rated *Best Choice*, a fish species (from a respective location) must have at least three of the five sustainability criteria considered as a low conservation concern with none of the criteria rated as high or critical concern. If the fish has only one high concern and/or the majority of the criteria is rated as yellow, then the species is ranked as a *Good Alternative*. If the fish’s sustainability criteria is ranked has 2+ criteria of high concern or 1+ or more of critical concern then the fish will be ranked as *Avoid* (MBA, 2011, p.118).

Table 4: MBA Seafood Watch – U.S. Pacific Salmon Sustainability Rankings

Sustainability Criteria	Conservation Concern			
	Low	Moderate	High	Critical
Inherently Vulnerability	√ (AK)	√ (CA, OR, WA)		
Status of Wild Stocks	√ (AK)	√ (WA, OR, CA)		
Nature of Bycatch	√ (AK except Chinook)	√ (AK Chinook)	√ (CA, OR, WA)	
Habitat Effects	√ (AK)	√ (CA, OR, WA)		
Management Effectiveness	√			

About the Overall Seafood Recommendation:

- A seafood product is ranked **“Avoid”** if two or more criteria are of High Conservation Concern (red) OR if one or more criteria are of Critical Conservation Concern (black) in the table above.
- A seafood product is ranked **“Good Alternative”** if the five criteria “average” to yellow (Moderate Conservation Concern) OR if the “Status of Stocks” and “Management Effectiveness” criteria are both of Moderate Conservation Concern.
- A seafood product is ranked **“Best Choice”** if three or more criteria are of Low Conservation Concern (green) and the remaining criteria are not of High or Critical Conservation Concern.

Source: MBA Seafood Watch, 2011

Seafood Watch relies on published academic, peer-reviewed publications and government technical publications, fishery management plans and scientific reviews to develop their rankings. Please refer to **Appendix A** for the list of guiding standards for the MBA Seafood Watch. The Pacific Salmon report evaluates five Salmon species including Chinook, Chum, Coho, Pink, and Sockeye. The range

of the report covers the territorial US Pacific coast from Southern California to Alaska. Please see Table 4 for the rankings for Alaskan, and Washington, Oregon, and California Salmon and the key.

The MSC's eco label is the most prominent label used for wild capture fishery. MSC has certified 190 fisheries and 97 are currently undergoing assessment. Out of these 19 of the fisheries supply the global market with Pacific Salmon that is rated sustainable by MSC. The MSC label is used to mark sustainable standards for more than 5000 products (www.msc.org; Oosterveer & Sonnefeld, 2012,p. 164). MSC is a registered non- profit and was established by the World Wildlife Fund (WWF) in 1997. As the market for sustainable seafood grows, pressure from retailers has intensified and created a rapid increase in the demand for fisheries to become certified. MSC-certified fisheries and labels can be found across the world. In 2006, MSC gained substantial recognition when WalMart pledged to source 100% of its wild seafood from MSC-certified fisheries (Annala et al.,2010). MSC employs a third party for determining if fisheries meet the following core principles: 1) supports sustainable fish stocks, 2) minimizes environmental impacts, 3) and demonstrates an efficient management system that can respond to the changing circumstances (Annala et al., 2010, p. 1103). Please see **Appendix B** for the full list MSC standards. In order to maintain their certification, fisheries are evaluated yearly to ensure the fisheries are continuing to meet sustainability criteria (www.msc.org, 2012; Roheim, 2009; Annala et al.,2010).

Annala et al. (2010) recognizes that in order for an eco-label to be successful then it must have a buy-in from key stakeholders (i.e., seafood marketers, consumers, and producers and managers) (p.1104).

Depending on the size of the business, the cost of certifying a fishery ranges from \$20,000 - \$300,000 (Annala et al., 2010, p. 1103). The MSC is innovative in the sense that it creates a cooperative alliance between the capture, producers, and traders of a particular fishery. In theory,

the MSC empowers the consumer and their practices in a more influential way than governmental regulation and it holds all actors in the production chain accountable. (Oosterveer & Sonnenfeld, 2012, p.163).

Through the MSC label, a flexible arrangement is introduced that seeks to combine environmental protection at the local spaces of production (the fishery practices), while acknowledging the existence of global markets for fish operating through the space of flows. This way, a new, 'green' product identity is created in the otherwise-anonymous global fish market. (Oosterveer & Sonnenfeld, 2012, p.165)

Something Fishy: The Politics of Conservation

“Critics say that the day Wal-Mart embraced sustainable seafood, it was a blessing for the MSC system – and a curse.” Critics argue that the “Wal-Mart effect” has lowered standards for the MSC and caused an increase in demand for sustainable fish products that the ocean’s fisheries cannot keep up with (Ponte, 2012; Zwerdling and Williams, 2013).

The MSC was created in 1992 after the collapse of the cod fishing industry in Nova Scotia. When cod stocks entered dangerously low population levels, the government intervened and closed the industry. The sudden collapse of a \$700 million dollar industry bankrupted several communities and left thousands unemployed. At the same time, studies were showing alarmingly low stock levels for other popular seafood items like swordfish and tuna species. From this, it became evident that government agencies were failing to monitor the health of ecosystems and fish populations (Jolly, 2010; Ponte, 2012; Zwerdling and Williams, 2013).

MSC has always taken the position that they serve as a means for balancing big industry interests and the interest of the oceans. However, critics of the system suggest that the MSC is an elaborate “greenwashing” system that continues to certify fisheries despite the evidence that the fisheries may

use harmful fishing practices or that target fish populations are dangerously low (Zwerdling and Williams, 2013).

The MSC was originally initiated as a collaborative project from the World Wildlife Fund (WWF). One of the founders of MSC, Michael Sutton, was VP of WWF at the time. He proposed an innovative idea toward getting the fishing industry on board with sustainable fishing practices. Sutton and his colleagues approached Unilever who at the time was the leading provider of frozen fish products and convinced the company that everyone has a stake in sustainable fishing practices. MSC business model leverages business interests by persuading big retail stores that sustainable fishing is a valued investment in the future of their business (Goyert, 2010; Jolly, 2010; Zwerdling and Williams, 2013).

Unilever and WWF jointly created the MSC in 1997. Unilever later sold its stake in the program, but the organization continues to promote the idea of sustainable fishing as a critical investment in the future of the fishing industry (Goyert, 2010).

According to an investigative NPR article by Zwerdling and Williams(2013) the MSC 's budget relies on both grants and the revenue from licensing fees. The MSC's financial model relies on supermarket's demand for sustainable fish to place demands on the fishing industry. In an interview with Zwerdling and Williams, Sutton explains that MSC was dangerously close to bankruptcy in the first decade due to virtually no demand for sustainable seafood. Then in 2006 Wal-Mart drastically increased the demand for MSC seafood product by pledging to use only MSC certified products by 2012 (Jolly, 2010; Zwerdling and Williams, 2013).

In Sutton's interview with Zwerdling and Williams, Sutton explained the critical impact of Wal-Mart's commitment to MSC "We had to get Wal-Mart..... Once Wal-Mart made a commitment to the MSC, every other major retailer had to follow suit, because none of them wanted to be less

progressive than Wal-Mart.” (Zwerdling and Williams, 2013) Sutton was proved right. The demand for MSC products was dramatically intensified from businesses like Whole Foods, Costco, and McDonalds. In fact the demand outsized the supply to the point that MSC could not deliver enough sustainable products for Wal-Mart to meet its 2012 pledge to carry only MSC certified sustainable seafood products (Zwerdling and Williams, 2013).

According to Zwerdling and Williams (2013), the MSC’s financial model also was dramatically impacted, due to the increase in demand for MSC certified products. Before the Wal-Mart pledge, MSC received 75% of their funding from foundation grants and only 7% from label licensing fees. After Wal-Mart’s commitment to MSC, their licensing fees generates more than half of the MSC’s revenue. Furthermore, the Walton Family Foundation, created by the founder of Wal-Mart and currently managed by his family has become one of its largest contributors with over millions of dollars in donations.

Since the “Wal-Mart effect” environmentalists and scientists fiercely accuse MSC of lowering their standards in order to provide MSC labeled seafood to Wal-Mart and other large retailers. No fishery that has ever applied for MSC has been denied. Advocates of seafood stocks and scientists refer to several examples that clearly violate core principles of any sustainability program such as harmful practices to surrounding ecosystems or critically low fish stocks. Others claim that the MSC label places pressures on sustainable stocks by shifting demand to those certified stocks, ultimately shifting the concern between species rather than mitigating overfishing practices (Jolly, 2010; Ponte, 2012; Zwerdling and Williams, 2013).

According to a New York Times article, published in 2010 the MSC received strong criticism for their decision to certify Norwegian fisher, Aker Bio Marine. Aker Bio Marine harvests Antarctic Krill for the costly production of farmed Salmon feed. Krill is a critical food source for many

Antarctica species including whale species and penguins. Environmentalists and ecologists worry that the label will encourage the exploitation of a critical food source (Jolly, 2010; www.pewresearch.org , 2010). In a press release from the Pew Environmental Group, Senior Environmental Officer, Gerald Leape, publicly denounced the MSC for their decision by issuing a press release with the following statement:

The MSC's label falsely advertises the message that all krill are sustainably caught and that consuming krill-based omega 3 supplements or purchasing farmed salmon raised on krill meal is okay. Nothing could be further from the truth..... In its decision, the MSC ignored irrefutable evidence put forward by numerous stakeholders including prominent Antarctic scientists, climate change and forage fishery experts and environmental groups (Gerald Leape, www.pewresearch.org, 2010).

According to the Pew Environment group, in this case the MSC only certified one operator in the Krill Antarctic fishery. This fails to take into account the risk of the target population being harvested in a harmful manner or overfished by other companies in the same geographical area. Additionally, the Pew Group cites the MSC failed to account for the impact of climate change and the several uncertainties that may threaten the population (Pewresearch.org,2010).

Zwerdling and Williams further uses the example of the Fraser River Pacific Salmon to further condemn MSC for its failure to uphold sustainability standards. The Sockeye Salmon of the Fraser River in British Columbia illustrates the inadequate and inconsistent nature of the third party audits for MSC certifications. Fraser River is an important breeding ground for several species of Pacific Salmon and supports a profitable fishing industry for the region. In 2009 government researchers announced that the sockeye population virtually collapsed when only 2 million sockeyes returned to reproduce in the Fraser river opposed to the original estimate of a 11 million. Fraser River fishing

community stated the label was necessary to continue exporting products to their European partners, because there is a higher demand for eco-labeled seafood in European supermarkets. How can the MSC certify the same fishery that is near collapse? The MSC will grant certifications “with conditions.” The certification will be given to the fishery to use while they make these changes. The conditional certification is misleading because it communicates a fishery is sustainable at the moment of the catch, which is not always true. In this case Intertek Moody Marine was responsible for auditing the Fraser River fisheries. Intertek Moody Marine is responsible for the initial audit and conducting yearly assessments to ensure ongoing sustainable practices are being employed. At the initial audit, Intertek Moody acknowledged there is not enough existing research to truly determine how the fisheries around the river were affecting the population area. While the International Union for Conservation of Nature was red-listing specific Salmon species from the Fraser River, the MSC was granting Fraser River a sustainable certification. The company could use the logo on their products with the condition that critical research would continue. According to the Zwerdling and Williams investigative report, Intertek Moody’s latest 2012 yearly assessment listed over 30 MSC standards that were still not met (Jolly, 2010; Ponte, 2012; Zwerdling and Williams, 2013).

In his peer-reviewed journal article, Ponte (2012), notes that the possibility of “conflicted interests with auditors assessments or reassessments are only anecdotal” (p. 313). Furthermore he cites several other concerns and failings of the MSC label. He concludes that there is not enough empirical research to determine the environmental progress of fisheries that use the MSC certification.

Additionally, Ponte suggest the MSC’s failure to include developing economies is disconcerting. The certification and the sustainability recommendations are costly and often unaffordable to low-income economies. The MSC board is composed of 13 fishery scientists and managers all from

Northern developed nations and the interests of the boards precludes the interests of developing economies (Ponte,2011).

The dominance of fishery management scientists, marketing, processing, chains of custody and logistic experts and of Northern-interest representatives, both in the formative years and in the configuration and consolidation of governance structures, has allowed the MSC to establish a Northern agenda built upon an internal balance between moderate environmentalism and techno-commercial imperatives, at the cost of socio-economic and labor issues and of Southern interests (Ponte, 2012, p.306).

The MBA Seafood watch has also formed corporate partnerships. MBA Seafood watch is a part of the Seafood Choice Alliance and also works with several restaurants and retailers to ensure that seafood red-listed by the Seafood Watch program is not being sold in these stores. Funding for the MBA's Seafood Watch comes from the Monterey Bay Aquarium Foundation's Trust, aquariums memberships, and donations from universities and conservation groups. This is contrary to the corporate governance structure of the MCS. As a result, the MBA program is less responsive to industry pressures.

Establishing the Role of a Retailer

From the last section, we understand that mounting pressures from retailers have intensified the usage of eco-labels and seafood sustainability programs. Retailers do not develop individualized treatments for managing fish stocks. For this reason, the retailer's narratives concerning their approach to supplying sustainable fish are discussed in its entirety, unless the retailer notes any specifications concerning Salmon products. This section takes a look at the programs from two stores Publix and Whole Foods. Both claim to have a commitment to sustainable seafood and carrying quality products that clearly communicate that commitment.

Greenpeace (2012) publishes a yearly report, *Carting Away the Ocean*, (CATO) where Greenpeace evaluates and scores supermarkets for their role in implementing sustainable seafood practices. Their report presents the findings for 20 US supermarkets and wholesale stores. The scores are developed by evaluating the following four items of each store. (1) A store's policy on purchasing decisions and production requirements for sustainable seafood. (2) The initiatives the retailers take outside of the grocery industry to promote sustainable seafood consumption. This may be in the form of coalitions, partnerships and/or community engaging activities. (3) The transparency of the store is graded and determined by the stores ability to provide quality information regarding the sustainability of the seafood they offer (e.g., eco-labels and sustainability rankings). (4) Lastly, the store's score is negatively impacted by the amount of "red listed" seafood the store continues to sell in spite of the fact that these species are ranked of high or critical concern. (Greenpeace, 2012). It is important to note that Greenpeace researches and develops their own red list of fish species. I use the Greenpeace's CATO criteria to evaluate the role of the retailer's policy in sustainable production ("www.greenpeace.org", 2013).

Whole Foods

Whole Foods Inc. has focused on sustainability and minimizing their environmental impact since it opened its first store in 1980 in Austin, Texas. Initially, organic food networks were premature. As a result, sourcing and distribution for organic food products was difficult. Consequently, the store developed its own produce distribution company and continues to evaluate every step of their vendor's production chain in order to ensure its commitment to quality organic produce.

Whole Foods is invested in the belief that people will pay a premium for healthy and organic food products. The store claims to ensure its success by investing in the highest quality products and developing strong relationships with their employees, vendors, customers, and the store's

community. Their environmental commitments include 1) supporting sustainable agriculture by promoting soil conservation and reducing pesticides, 2) eliminating waste through recycling initiatives and reduced packaging, 3) and promote energy efficiency methods and maintenance programs by encouraging water and energy conservation (Baldwin, 2009, p.220; www.wholefoodsmarket.com). Additionally, the store has created “healthy eating educational programs” to serve its employees and customers (www.wholefoodsmarket.com).

According to Whole Foods, their commitment to sustainability is also evident in the seafood products. The company claims to carry quality aquaculture products by using a third party system to ensure their products uphold Whole Food’s health and environment standards. However, these standards or methods are not clearly identified on their website; Whole Foods issues the following statement regarding their Farm-Raised Salmon.

Our [farmed] Salmon is raised in carefully monitored, low-density pens without antibiotics, pesticides or added growth hormones. Detailed protocols prevent escape of the salmon into the wild, and harmful and lethal methods are never used on predator birds and marine mammals (Whole Foods Inc (“www.wholefoodsmarket.com/mission-values”, n.d.).

Additionally, Whole Foods uses MSC labeled fisheries to stock their wild-caught fish products. For all other wild-caught seafood products that do not use the MSC labels, the store labels products with the color coded ratings from the Blue Ocean Institute (BOI) or the MBA Seafood Watch. The BOI sustainability ranking system is similar to the MBA Seafood Watch and uses the traffic light color coding system to rank seafood species. Additionally, the company pledges to never carry any product that are “ranked red” by either the MBA Seafood Watch or the BOI. The list of red-rated species that they no longer carry is posted on their website. Whole Foods also explains on their website why they chose MSC certification, and the MBA and BOI ranking programs “We selected

these partners because they are highly respected for the strength of their science-based seafood programs.” Additionally, citing that these partners are known for their transparent ranking methods and all of their evaluations are easily accessible online (“www.wholefoodsmarket.com/mission-values”, n.d.).

In the Greenpeace supermarket evaluation, Whole Foods was ranked overall second best out of the twenty stores being evaluated. The stores received high scores in their policy and initiative categories. However, it is important to note a discrepancy in the transparency and the “red listed” category. Whole Foods’ score was impacted due to the fact that Greenpeace does not endorse MSC’s rating and its “red list” includes several more species than the MBA or BOI programs. The failure to provide measurement information on their farmed salmon should also be seen as failure to their commitment of transparency.

Publix

Publix operates primarily in the southern states. With over a 1000 stores, Publix is one of the largest employee owned supermarket chains in the U.S. (www.publix.com, 2013; Greenpeace, 2012). Publix carries its own organic or all natural products, *Greenwise*, and has made substantial progress in expanding the line. On the matter of seafood sustainability Publix claims on its website that it is a “pioneer” in seafood sustainability practices (www.publix.com, 2013). In 2009, the store hosted the Publix Seafood Sustainability Summit in order to launch their seafood sustainability program. Similar to Whole Foods, Publix has created partnerships with scientific research group and sustainability managers: Ocean Trust, Ocean Conservancy and Sustainable Fisheries Production (www.publix.com, 2012; Greenpeace, 2012). However, Publix acknowledges that its sustainability program is still in the planning stages. On their store sustainability website, the company outlines its ambitions to implement a sustainable seafood program in a three phase project.

Phase 1 is a research and data collection phase that was completed in August of 2010. During this phase Publix conducted a data collection and compilation for all the seafood that was being sold in their stores. Phase 2 Publix administers an internal product evaluation. According to their website in this stage product decisions will be made and “improvement projects” will be implemented. Phase 3 is the final stage. In this phase, the retailer continues to administer improvement projects and initiates action plans to ensure an ongoing effort to measure the progress and maintenance of sustainable practices from their partners (www.publix.com, n.d.).

However it seems the company’s efforts for sustainable production have fallen flat. Publix claims to still be in Phase 2 since the completion of Phase 1 in August of 2009. Publix has not disclosed the results for Phase 1. Furthermore, Publix description of the phases does not provide any details on the objectives of their improvement projects, their current status, or how they will be administered. Despite their partnership with Ocean Trust, the company does not offer any eco-labels or sustainability rankings on their seafood products (www.publix.com, n.d.).

Publix does not currently participate in any seafood labeling programs. The labels, which are meant to inform consumers about products that are sustainable, can be confusing because of inconsistencies between the programs. The Marine Stewardship Council (MSC) is perhaps the best known of all the labeling programs, but the cost of certification is too much for many small industry fisheries (Publix, www.sustainability.publix.com).

According to Greenpeace, the company continues to sell significant amount of red-listed seafood. Out of the twenty-two species that Greenpeace labels red listed, Publix sold fifteen of the stocks in their stores, including Orange Roughy and Chilean Sea Bass. Publix does not offer any detailed information on the fisheries that supplies their wild-caught or farmed Pacific Salmon. Publix was ranked 19 out 20 stores in Greenpeace’s sustainable seafood retail program. Additionally,

Greenpeace harshly rated Publix for their failure to incorporate store policies and standards for the product they sell and their lack of a transparent program for eco-labeling.

From this, it becomes clear that Publix takes a very different approach toward developing sustainability than the previous campaigns that are driven by retailer and consumer demand for sustainable products.

Unlike other programs, we do not believe that change can happen by avoiding products. The fact is that all harvested seafood is sold to someone. In a worldwide industry such as seafood, change is truly driven by supporting the industry as they work through the issues that are causing them to be unsustainable (Publix Supermarket, n.d., www.sustainability.publix.com).

Publix takes the opposite position of Whole Foods. Whole Foods establishes an incentive for fisheries to commit to sustainable fishing whereas Publix's program does not outline a sustainability solution or purpose for convincing fisheries to join their cause.

Globalized Governmental Regulation

Oosterveer & Sonnenfeld (2012) discuss the impact of globalization on the food industry and the impact on sustainability efforts in their book *Food, Globalization, and Sustainability*. They argue that globalization has created challenges for the food regulating industry. Similar to Beck, Oosterveer and Sonnenfeld express the significance of a "glocal" perspective (Beck, 1999).

Global and local are inextricably and irreversibly bound together through dynamic relationship, whereby connections between the two may be more or less mobile, intense, social, or distant. They are not mutually exclusive concepts (Oosterveer & Sonnenfeld, 2012 p.15).

As a result of accelerated globalization, industrialized nations relying on international food flows are witnessing a monumental shift in food regulation. Production areas and structures are becoming too large to govern. It is difficult to create transparent policies and production practices due to the great distances food travels and the several steps of processing (Iles, 2004). As a result the politics of food flows are being determined by producers, traders, processors, and consumers. Previously food regulation was a system where governments were responsible for ensuring quality and safety. This is being replaced with a multilateral system where several actors collaborate, in order to promote a global governance system. This collaboration is demonstrated in the alliance between Whole Foods and MBA and MSC. To date global governance systems has directed their resources to facilitating free flows of food to enrich the capitalistic process and there has been little concern for guaranteeing sustainability and minimizing environmental impact of these ventures (Oosterveer & Sonnenfeld, 2012).

With that being said, this section discusses the existing frameworks for governing US Pacific Salmon product. Up until this point the paper has addressed expressing sustainability through consumer demand. I discuss whether ecological citizens can rely on the meaningful policies and practices of the governing fishery regulation. From this I hope to determine the ability for ecological citizens to send meaningful feedback to the industries concerning the need for sustainable sources.

U.S. Pacific Salmon fisheries are especially difficult to manage. They are anadromous species and travel across state and country borders. As a result the fisheries are managed by four state departments of fish and wild life (California, Oregon, Washington and Alaska) and two regional fishery councils, the Pacific Fishery Management Council (PFMC) and the Pacific Salmon Commission (PSC). Due to severe stock depletion, the federal governmental also monitors select West Coast salmon species since the 1990's under the Endangered Species Act. Additionally, Native

American tribes have some rights to Salmon fishing. The PSC is a bilateral agreement between Canada and the US concerning the management of Salmon harvest levels. The PFMC manages ocean salmon fishers off the coasts of California, Oregon, and Washington. The Alaskan Department of Wildlife and Fish have considered the leading manager in the Alaskan territory and only work with the PSC and ESA for specific territories and critically depleted species.

The MBA evaluates the regulating bodies at length in the Pacific Salmon Sustainability Report. The report divides the US Pacific Salmon into two categories: Alaskan Pacific Salmon and Washington, California and Oregon Pacific Salmon. Their sustainability criteria are evaluated individually. The MBA ranked the Management of Alaska Salmon as the Best Choice, but cited several management problems with Washington, California, and Oregon Pacific Salmon. Washington, California, and Oregon Pacific Salmon have suffered greater habitat destruction to their freshwater rivers and streams, making it more difficult for Salmon return to their spawning ground. Recall, the importance of escapement quotas. According to the MBA, the PFMS inflated escapement numbers in 2007 and the fishing season for 2007-2008 was not constrained appropriately. This, in combination with other uncontrollable factors, caused enormous pressure on the stocks, therefore the fisheries were not opened the following 2008-2009 season. Despite that the bias was corrected after 2009, the predicted escapement amount still did not reflect the actual escapement amount. Scientists find this disconcerting and it raises questions on the effectiveness of the current management strategies to ensure the viability of Salmon species in that area.

For the intensive purposes of commercial sale Atlantic Salmon stocks are virtually extinct and US Pacific Salmon stocks are gradually declining. Given the extreme shortages, many scholars argue that it is an indicator of market failure, that Salmon prices do not reflect the scarcity of Salmon.

Additionally, the environmental and social costs are externalized in the fishing industry ultimately sending incorrect information to the consumer. (Greenberg, 2010; Seyfang 2005)

Furthermore, current management in the Washington, Oregon, and California areas have not been able to prevent long-term decline in fishery stocks. On the other hand, Alaska is considered to have considerable efficient management practices. Monitoring the stocks very closely and accurately, the Alaskan Department of Wildlife and Fish have proven to be thorough in setting their fishery quotas to reflect the escapement amount. Furthermore, they have proven effective in rehabilitating several Salmon populations. Greenberg (2010) writes of the following describing the precautions that Alaska demonstrates in the management of Salmon fisheries.

When it comes to Salmon, Alaska is like a little wise old man sitting on a far northern perch overlooking the destruction that humanity has wrought farther south. Almost invisibly, the shock wave from the global near eradication of wild salmon seems written into the landscaped of this richest of seafood states (Greenberg, 2010, location 369).

Why have Alaskan fisheries proven more efficient than the Western Coasts? The governing policies in Alaska are for the most part centralized in the Alaskan Department of Wildlife and Fish. Unlike the several state, federal and international agencies in Oregon, California, and Washington.

Additionally Alaska does not have the same degree of habitat loss, pollution, and the introduction of the invasive species as the West Coast. However MBA is critical of both Alaskan and Oregon, California, and Washington fisheries for their release of hatchery-raised eggs. Recall the concern that is mentioned in previous sections regarding the release of hatchery-raised eggs by governing fisheries. In the following section, we discuss the implications and impacts these actors have on eco-citizenship.

Case Study Discussion

A key component to any change in fishery management is to understand the attitudes, values, and preferences of the people involved – fishermen, producers, managers, and the consumers (Annala et al, 2010, p.1104). This section critically analyzes the attitudes and behaviors of the actors listed above. I draw conclusions regarding the MBA Seafood Watch program and similar consumer awareness campaigns, and MSC eco-labeling schemes. This section evaluates the ability (or lack thereof) for these campaigns to nurture engaged citizens and overall create the terms of citizenship that is required for the application of Andrew Dobson’s ecological citizenship.

Iles (2004) argues that sustainability efforts by groups like the MBA Seafood Watch are ineffective in nurturing eco-citizens in their decisions for several reasons. Most importantly, the information they provide fails to create a sense of community for citizens.

Belonging to a group or community, engaging in political deliberation as a member of that group, demanding the right and ability to make and test knowledge claims affecting life within the group, and claiming access to vital societal resources. (Iles, 2004, p. 130)

Iles argues that programs like the MBA Seafood Watch give citizens an “unidirectional role”. By supplying citizens with the information of sustainable species and relying on citizens to demand information is unsuccessful in creating an identifiable community where citizens are propelled by a common goal. Iles argues that this failure damages the potential for a progressive social movement. Secondly, he argues these groups do nothing to facilitate deliberation between fishermen and consumers. Unlike the MSC eco-label, this program does not hold fishermen accountable nor create a common discourse among actors within a fishery. Without finding methods for instilling democratic discourse between fishermen and consumers, political engagement cannot take root. Additionally without creating buy-in from the involved actors, self- regulation will continue to

monitor only the quotas of fish and never the harmful fishing practices. Lastly, Iles argues that sustainability efforts are directed toward a narrow band of upper-class consumers (p.128). Without the resources or access to premium products, the opportunity for having quality sustainable choices is limiting. This is furthered by the previous discussion MBA Seafood Watch label is mostly available in a premium organic markets, like Whole Foods. As of now, there is no sustainability ranking or eco-labeling at Publix.

In theory, it seems the MSC is more efficient in determining sustainable food choices and communicating that to the consumer. The MSC eco-labels have had more success to reach different socio-economic groups by reaching out to big box discount stores like Wal-mart, fast food companies like McDonalds, and developing worlds. Furthermore, by the MSC evaluating the entire supply chain, they essentially foster eco-citizenship in two ways. This method promotes deliberation and unites all industry actors towards the goal of gaining the MSC certification. Secondly, it also holds fishermen and producers accountable for their own practices and methods. Additionally, by analyzing the life-cycle of a product MSC certification most resembles the ecological footprint that Dobson uses as a touchstone in measuring sustainability. This highlights the material and monetary global flow between industrialized and developing countries.

However, we have seen the MSC is plagued with criticism for relaxing sustainability criteria in order to further business agendas. Additionally the MSC has failed to enable developing countries to pursue sustainable fishing practices. Scientists and advocates alike have accused MSC for ignoring the needs of developing countries and for relaxing sustainability standards to promote the growth of businesses. Charges for fraudulent certification should be understood as a massive failure for the MSC and consequently creates an invitation for competing certifications to enter the market.

Additionally, both the MSC and MBA Seafood Watch labels fail to account for the carbon footprint of these global flows. This should be an important adjustment as global climate change continues to exacerbate food shortages. Furthermore, gaining the MSC certification is a costly and time consuming, taking between two to five years. As a result, the MSC certification cannot keep up with the global demand for fish products. This gap in time and resources solidify the importance of consumer awareness campaigns and brings us back to the purpose of the MBA Seafood Watch. While the sustainability rankings fail to nurture a community for eco-citizens, they can provide valuable scientific data for the consumer.

From the case study comparing Whole Foods and Publix, it becomes clear that retailers play a critical role in demand for certifications and science that communicate the sustainability of a product. Supermarket, like Whole Foods, supply a science based commitment that is clearly articulated and reinforced in the products they carry. Supermarkets like Whole Foods also contribute the opportunity to form a community or an environmental network that further enhances environmental values and behaviors. Horton explains that citizenship is propelled by building a green identity. "My contention is that green activists practice environmental citizenship that is produced through their ongoing participation in a cultural world comprised of green networks, spaces, materialities, and times." (Horton, 2003, p.143) In the sense that Horton suggests, retail stores, like Whole Foods, offer an opportunity to reinforce and eco-citizen's commitment to a green identity, by supplying them with access to green spaces and material goods and further developing are building a community for eco-citizens. Recall, a community that is essential tool for eco-citizens and sustainable pursuits.

It is important here not to confuse the purchase of organic produce and product for one's own well-being as the behavior of an eco-citizen. While an eco-citizen may purchase organic products, it is

fueled by a deeper obligation to minimizing harmful environmental practices and minimizing the global injustices for global citizens. From the retail comparison, one can also see that science and sustainability policies are far from being rated equally. It is here that environmental education is most important in deciphering between green washing marketing practices and sustainability measurements that are rooted in science. With that being said, eco-labels are in the early stage of development. While they are not flawless, they represent a transition to increasing the transparency and accountability of the fishing industry and communicating science to eco-citizens.

Furthermore, this case study illustrates the various barriers and limitations imposed on ecological citizens from the current governing system. Globalization has led us from a single governing food industry to a multi-actor collaboration, one where a regulatory capitalism emerges.

The coherent nation-based food regulation of the past is replaced by multiple arrangements, whereby nation states provide only the general regulatory background, while central principles, procedures and responsibilities are in the hands of non-state actors. Key questions then become how are these emerging arrangements made possible, and on what their authority and legitimacy is based (Oosterverr and Sonnenfeld, 2012 p. 73).

In the case of US Pacific Salmon, NGOs are working to fulfill the obligations where governmental policies and regulations are lacking. Recall from the literature review, effective sustainable policies are based on trustworthy resources, the precautionary principle, democratic participation, equity, and integrative policies. While it seems Alaska exercises some restraint and precaution in the fishing quotas, it seems all of US fish and wild life are discarding the precautionary principle when it comes to the implications for hatchery grown Salmon. With so many overlapping regulation efforts, it has proven difficult for California, Washington, and Oregon to integrate policies across territories.

Lastly, the governing agencies have made no initiatives to include equity and democracy in their regulations. Governing agencies or even methods for self-regulation should attempt to create communities where sustainability discourse can be prioritized (Iles 2004). Furthermore, the price of Pacific Salmon should reflect the scarcity of the fish and internalize the environmental costs. Governing agencies should establish a universal definition for sustainability to ensure that practices are consistent across jurisdictions (Greenberg, 2010; Iles 2004; Oosterverr and Sonnenfeld, 2012).

CHAPTER FIVE: RESULTS AND CONCLUSIONS

In the Tragedy of Commons, Garret Hardin (1968) declares “Natural selection favors the forces of psychological denial. The individual benefits from is ability to deny the truth even though society as a whole, of which he is a part, suffers.” (Hardin, 1968, p. 1245) Hardin identifies the heart of the sustainability crisis. Without the engagement of citizens pursuing a transparent direction for a sustainable movement, sustainability concerns will continue to be shelved so convenient and short term gains for capitalistic industry profits can be realized.

From the case study we saw that eco-labels are not without their flaws, but do present a means for measuring sustainable processes. Pro-environmental behaviors and values can be nurtured by the green spaces and green materialities that are found in premium specialty shops like Whole Foods. The globalized food system is part of an interdependent complex network of actors. As a result the governing system is plagued with bottle neck procedures and fails to provide engaging political frameworks. What is the bigger picture here for ecological citizens? Without the acknowledgement and involvement of all these actors, then the efforts for eco-citizen are confined to providing market feedback by shopping at specialty stores like Whole Foods. Dobson warns against prescribing to an environmental program that is motivated by fiscal incentives and disincentives (Dobson, 2003). He cautions that these market based instruments that do nothing to change the self-interest behavior will not provide a means for developing environmentally responsible behavior (Dobson, 2006, p.5).

Recall, that Seyfang also warns against mainstream sustainable consumption policies that are market-based and are non-transformative. Mainstream sustainable consumption fails to address the concerns of eco-citizens and at times even hinders the transformative potential for ecological citizenship. As we saw in the case study, sustainable consumption places obligations on the consumer, consequently pitting an eco-citizen against impenetrable institutional barriers. As a

market-based tool mainstream sustainable consumption is developed upon consumer feedback. Often, as illustrated in the case study, consumer feedback is incorrectly assessed due to inaccurate price indicators, inconsistent sustainability measurements, and failure of scientific information. Additionally, a general lack of source information and credibility concerns are information barriers that impede the process of eco-citizens to make the choices that would minimize their ecological impact and uphold their commitments to social equity and environmental justice. Our current economic indicators, like GDP, fail to account for activities that enhance quality and measure meaningful sustainable development. (Seyfang, 2005, p.295)

From the case study and existing literature, it becomes evident that while there are significant strides being made toward the “mainstream” sustainability movement, the framework for revolutionizing the buying behavior and cultivating ecological citizenship that Dobson describes is not present (Dobson, 2003; Seyfang, 2005).

Discussion

The following section identifies recommendations for consumer campaigns and the general framework for facilitating opportunities and eliminating barriers for eco-citizens. The following recommendations can be used for the fishing industry but can be considered by other industries to change consumption behavior across several sectors.

Oosterveer and Sonnenfeld suggest a sustainable food system would have the following qualities:

A sustainable food system has a productive and responsive management system that can respond to the changing demand and can place limits on emissions and impose energy and resource efficiencies on all levels of the food chain (Oosterveer & Sonnenfeld, 2012 p.45).

Iles (2004) emphasizes the importance of closing the gap in consumer campaigns in order to create more meaningful connections to eco-citizenship. These campaigns should work to expand the community and include developing countries. Expanding the citizens' community is critical to the framework of ecological citizenship (Iles, 2004, p.137). Iles (2004) also suggests creating institutions to discuss what sustainability means and how can it be measured. Such institutions should 1) determine a universal standard for measuring sustainability and eliminate the confusion across programs and eco labels. 2) Develop networks throughout the industry. In the case of fisheries, these networks will provide a system for holding production chains accountable for their fishing methods and how these methods are communicated to the consumer. Additionally, they will create a space to foster relationships with producers and fishers. Including them in the community of sustainability will create a lasting commitment to sustainable practices (Iles, 2004). Furthermore, initiatives should prioritize creating and communicating transparent science and finding ways to track the contribution of sustainable buying behavior. Highlighting both the accomplishments and drawbacks of the industry will develop transparency and unity within the community (Iles, 2004).

Additionally, Seyfang (2005) suggests transformative and "radical" sustainable consumption initiatives will start by eliminating unnecessary global exchange of food products. Local economies will be strengthened by concentrating the exchange of goods in their respective region and developing alternative community currencies (p.301).

Lastly, institutional and governmental reform should modify the existing accounting procedures so that they measure the quality and happiness of life and the gains of sustainable development.

Additionally, prices should reflect environmental costs and scarcity (Dobson, 2003; Seygang, 2005). Governments and institutions will continuously see their ethics and their state-centric authority challenged by globalization and emerging technologies. Instead of delivering top-down,

legally binding policies, perhaps governments should invest in the happiness and well-being of their communities. Instead governments could invest in community programs that increase social capital and discourage practices that resemble “regulating capitalism” and industry self – regulation.

So in closing, I leave you with Aldo Leopold’s words regarding community and citizenship from his book *A Sand County Almanac* :

All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts.....The land ethic simply enlarges the boundaries of the community to include soils, waters, plants and animals, or collectively: the land.....A land ethic changes role of *Homo sapiens* from conqueror of the land – community to plain member and citizen of it. It implies respect for his fellow-members, and also respect for the community as such (Leopold, 1949, p.203-204).

APPENDIX A: SEAFOOD WATCH CONSERVATION PRINCIPLES

Our Definition of Sustainable Seafood

We define sustainable seafood as seafood from sources, whether fished or farmed, that can maintain or increase production without jeopardizing the structure and function of affected ecosystems.

Our Guiding Principles

The following guiding principles illustrate the qualities that fisheries and aquaculture operations must possess to be considered sustainable by the Seafood Watch program.

- Sustainable Fisheries: Utilize stocks that are healthy and abundant;
 - Do not threaten populations or impede the ecological role of any marine life; Minimize bycatch, where possible;
 - Are managed to sustain long-term productivity of all impacted species;
 - Are conducted such that impacts on marine habitats are minimized and the ecological and functional roles of these habitats are maintained;
 - Should not seriously reduce ecosystem services provided by any species, or result in harmful changes such as trophic cascades, phase shifts, or reduction of genetic diversity.
- Sustainable Aquaculture Operations:
 - Have robust and up-to-date information on production practices and their impacts readily available to relevant stakeholders;
 - Minimize or avoid the production and discharge of wastes at the farm level, in combination with an effective management or regulatory system to control the location, scale and cumulative impacts of the industry's waste discharges beyond the immediate vicinity of the farm;
 - Are located at sites, scales and intensities that cumulatively maintain the functionality of ecologically valuable habitats;
 - By design, management or regulation avoid the discharge of chemicals toxic to aquatic life, and/or effectively control the frequency of use, risk of environmental impact, and risk to human health;
 - Source only sustainable feed ingredients, convert them efficiently and responsibly, and minimize and utilize the non-edible portion of farmed fish;
 - Pose no substantial risk of deleterious effects to wild populations associated with the escape of farmed fish or other unintentionally introduced species;
 - Pose no substantial risk of deleterious effects to wild populations through the amplification and retransmission of pathogens or parasites;
 - Use eggs, larvae, or juvenile fish produced from farm-raised brood stocks thereby avoiding the need for wild capture.

These guiding principles inform the development and maintenance of our criteria for sustainability against which we assess fisheries and aquaculture operations.

These guiding principles also inform the methodology used to rank fisheries and aquaculture operations. For example, a fishery that meets all relevant sustainable fisheries principles in essence should be considered a Best Choice. Those that meet some, are Good Alternatives, those that don't meet a majority or are extremely poor in one are recommended as Avoid.

Our Sustainability Criteria

The goal of our sustainability criteria is to allow assessment of the sustainability of fisheries or aquaculture operations according to our guiding principles and conservation ethic.

Seafood Watch Fisheries Criteria

Through four criteria and 12 associated factors we assess fisheries to determine whether the abundance of both targeted and incidentally caught species is maintained in the long term at levels that allow the species to fulfill its ecological role while the structure, productivity, function and diversity of the habitat and ecosystem are all maintained. Furthermore we determine whether a management system is in place that enforces all local, national and international laws to ensure long-term productivity of the resource and integrity of the ecosystem by adhering to the precautionary approach and responding to changing circumstances.

Criterion 1 – Impacts of the Fishery on the Stock in Question

- The stock is healthy and abundant. Abundance, size, sex, age and genetic structure should be maintained at levels that do not impair the long-term productivity of the stock or fulfillment of its role in the ecosystem and food web.
- Fishing mortality does not threaten populations or impede the ecological role of any marine life. Fishing mortality should be appropriate given current abundance and inherent resilience to fishing while accounting for scientific uncertainty, management uncertainty, and non-fishery impacts such as habitat degradation.
 - Factor 1.1 Inherent resilience of the stock
 - Ensure fishing mortality and other management measures are appropriate for the inherent resilience of the stock.

- Factor 1.2 Health of the stock
Stock abundance and size structure is maintained at a level that does not impair recruitment or productivity.
- Factor 1.3 Fishing pressure
Fishing mortality is appropriate for current state of the stock.

Criterion 2 – Impacts on Other Species

The fishery minimizes bycatch. Seafood Watch defines bycatch as all fisheries-related mortality or injury other than the retained catch. Examples include discards, endangered or threatened species catch, pre-catch mortality and ghost fishing. All discards, including those released alive, are considered bycatch unless there is valid scientific evidence of high post-release survival and there is no documented evidence of negative impacts at the population level.

Fishing mortality does not threaten populations or impede the ecological role of any marine life. Fishing mortality should be appropriate given each impacted species' abundance and productivity, accounting for scientific uncertainty, management uncertainty and non-fishery impacts such as habitat degradation.

- Factor 2.1 Inherent resilience of the bycatch and other retained stocks
Ensure fishing mortality and other management measures are appropriate for the inherent resilience of all bycatch stock(s).
- Factor 2.2 Health of bycatch and other retained stocks
Stock abundance and size structure of all main bycatch species/stocks is maintained at a level that does not impair recruitment or productivity.
- Factor 2.3 Mortality caused by this fishery on bycatch and other retained stocks
Fishing mortality is appropriate for the current state of all main bycatch species/stocks.
- Factor 2.4 Secondary factor: discards and bait use
Fishery optimizes the utilization of marine resources by minimizing post-harvest loss and by efficiently using marine resources as bait.

Criterion 3 - Effectiveness of Management

The fishery is managed to sustain the long-term productivity of all impacted species. Management should be appropriate for the inherent resilience of affected marine life and should incorporate data sufficient to assess the affected species and manage fishing mortality to ensure little risk of depletion. Measures should be implemented and enforced to ensure that fishery mortality does not threaten the long-term productivity or ecological role of any species in the future.

- Factor 3.1 Management of fishery's impacts on fished stocks
Management strategy has a high chance of preventing declines in stock productivity by taking into account the level of uncertainty, other impacts on the stock, and the potential for increased pressure in the future.
- Factor 3.2 Management of fishery's impact on bycatch species
Management strategy prevents negative population impacts on bycatch species, particularly species of concern.

Criterion 4 – Habitat and Ecosystem Effects

The fishery is conducted such that impacts on the seafloor are minimized and the ecological and functional roles of seafloor habitats are maintained. Fishing activities should not seriously reduce ecosystem services provided by any fished species or result in harmful changes such as trophic cascades, phase shifts or reduction of genetic diversity.

- Factor 4.1 Impact of fishing gear on the substrate
The fishery does not adversely impact the physical structure of the seafloor or associated biological communities.
- Factor 4.2 Modifying factor: mitigation of fishing gear impacts
Damage to the seafloor is mitigated through protection of sensitive or vulnerable seafloor habitats, and limits on the spatial footprint of fishing on fishing effort.
- Factor 4.3 Ecosystem and food web considerations
All stocks are maintained at levels that allow them to fulfill their ecological role and to maintain a functioning ecosystem and food web. Fishing activities should not

seriously reduce ecosystem services provided by any retained species or result in harmful changes such as trophic cascades, phase shifts or reduction of genetic diversity.

Seafood Watch Aquaculture Criteria

Through eight criteria and 15 associated factors we can assess the ecological sustainability of all aquaculture species and production systems at all scales from individual farms to regional, national and international industries. Two factors (3.3X and 6.2X) are exceptional factors that may not be relevant to all aquaculture production, yet can be a significant concern for those production practices where relevant. Whereas all other factors score positively and contribute to the overall score total, the exceptional factors are given a negative score which is subtracted from the final total score for those aquaculture operations where it is a concern.

Criterion 1 – Data

Robust and up-to-date information on production practices and their impacts is available to relevant stakeholders. Poor data quality and availability limits the ability to assess and understand the impacts of aquaculture production. It also does not enable informed choices for seafood purchasers or enable businesses to be held accountable for their impacts.

- Factor 1.1 Data relevance
Confirm which data categories are relevant to the aquaculture operations being assessed.
- Factor 1.2 Data quality
A measure of the availability and quality of relevant data.

Criterion 2 - Effluent

Aquaculture operations minimize or avoid the production and discharge of wastes at the farm level in combination with an effective management or regulatory system to control the location, scale and cumulative impacts of the industry's waste discharges beyond the immediate vicinity

of the farm. Aquaculture species, production systems and management methods vary in the amount of waste produced per unit of production. The combined discharge of farms, groups of farms or industries contribute to local and regional nutrient loads.

- Factor 2.1 Waste discharged per ton of fish
A measure of the amount of waste discharged from the farm per ton of fish produced, using nitrogen as the most data-rich proxy indicator.
- Factor 2.2 Management of farm-level and cumulative impacts
This criterion is a measure of the presence and effectiveness of laws, regulations and management control measures (appropriate to the scale of the industry) to limit the total discharge of wastes from farms and the cumulative impacts of aquaculture effluent from multiple farms to within the carrying capacity of the receiving environment.

Criterion 3 – Habitat

Aquaculture operations are located at sites, scales and intensities that cumulatively maintain the functionality of ecologically valuable habitats. Aquaculture farms can be located in a wide variety of aquatic and terrestrial habitat types and have greatly varying levels of impact to both pristine and previously modified habitats as well as to the critical “ecosystem services” they provide.

- Factor 3.1 Habitat conversion and function
A categorical measure of habitat impact taking account of the ongoing functionality of affected habitats and the historic or ongoing nature of the habitat conversion for aquaculture
- Factor 3.2 Farm siting management effectiveness
A measure of the presence and effectiveness of regulatory or management controls appropriate to the scale of the industry, and therefore a measure of confidence that

the cumulative impacts of farms sited in the habitats declared in Factor 3.1 above are at appropriate spatial scales.

- Factor 3.3X Predator and wildlife mortalities
A measure of the effects of deliberate or accidental mortality on the populations of affected species of predators or other wildlife.

Criterion 4 – Chemical Use

Aquaculture operations by design, management or regulation avoids the discharge of chemicals toxic to aquatic life and/or effectively controls the frequency, risk of environmental impact, and risk to human health of their use. Improper use of chemical treatments impacts non-target organisms and leads to production losses and human health concerns due to the development of chemical-resistant organisms.

- Factor 4.1 Evidence or risk of chemicals use
A measure of the likelihood of chemical use and discharge to the environment, taking account of the fundamentally poor availability of and low confidence in chemical use data.

Criterion 5 - Feed

Aquaculture operations source only sustainable feed ingredients, convert them efficiently and responsibly, and minimize and utilize the non-edible portion of farmed fish. Feed consumption, feed type, ingredients used and the net nutritional gains or losses vary dramatically between farmed species and production systems. Producing feeds and their ingredients has complex global ecological impacts, and the efficiency of conversion can result in net food gains or dramatic net losses of nutrients. Feed use is considered to be one of the defining factors of aquaculture sustainability.

- Factor 5.1 Wild fish use
A measure of the amount of wild fish used to produce farmed fish, combined with the sustainability of the fisheries from which they are sourced.

- Factor 5.2 Net protein gain or loss
A measure of the net protein gained or lost during the fish farming process.
- Factor 5.3 Feed footprint
An approximate measure of the global resources used to produce aquaculture feeds based on the global ocean and land area used to produce the feed ingredients necessary to grow one ton of farmed fish.

Criterion 6 – Escapes and Introduced Species

Aquaculture operations pose no substantial risk of deleterious effects to wild populations associated with the escape of farmed fish or other unintentionally introduced species. Competition, genetic loss, predation, habitat damage, spawning disruption, and other impacts on wild fish and ecosystems resulting from the escape of native, non-native and/or genetically distinct fish or other unintended species from aquaculture operations.

- Factor 6.1 Escape of principal farmed species
A combined measure of the physical risk of escape, with the ecological risk of impact for the species being farmed.
- Factor 6.2X Escape of unintentionally introduced species
A measure of the escape risk (introduction to the wild) of alien species other than the principal farmed species unintentionally transported during live animal shipments.

Criterion 7 – Disease, Pathogen and Parasite Interaction

Aquaculture operations pose no substantial risk of deleterious effects to wild populations through the amplification and retransmission of pathogens or parasites. Most pathogens or parasites on farms are considered to originate from the surrounding water and therefore are of concern to surrounding populations when amplified.

- Factor 7.1 Disease, pathogen and parasite interaction

A measure of the infection risk between farm and wild populations, assuming that farms, by their nature, typically act as amplifiers of local naturally occurring and introduced pathogens and parasites.

Criterion 8 – Source of Stock – Independence from Wild Fish Stocks

Aquaculture operations use eggs, larvae, or juvenile fish produced from farm-raised broodstocks thereby avoiding the need for wild capture.

- Factor 8.1 Independence from wild capture fisheries

A measure of the aquaculture operation’s independence from active capture of wild fish for on-growing or broodstock.

| Last Updated 7/5/12

**APPENDIX B: MSC FISHERY STANDARD: PRINCIPLES & CRITERIA
FOR SUSTAINABLE FISHING**

Date of issue: 1 May 2010

PRINCIPLE 1

A fishery must be conducted in a manner that does not lead to over-fishing or depletion of the exploited populations and, for those populations that are depleted, the fishery must be conducted in a manner that demonstrably leads to their recovery:

Intent:

The intent of this principle is to ensure that the productive capacities of resources are maintained at high levels and are not sacrificed in favour of short term interests. Thus, exploited populations would be maintained at high levels of abundance designed to retain their productivity, provide margins of safety for error and uncertainty, and restore and retain their capacities for yields over the long term.

Criteria:

1. The fishery shall be conducted at catch levels that continually maintain the high productivity of the target population(s) and associated ecological community relative to its potential productivity.
2. Where the exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level consistent with the precautionary approach and the ability of the populations to produce long-term potential yields within a specified time frame.
3. Fishing is conducted in a manner that does not alter the age or genetic structure or sex composition to a degree that impairs reproductive capacity.

PRINCIPLE 2:

Fishing operations should allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends.

Intent:

The intent of this principle is to encourage the management of fisheries from an ecosystem perspective under a system designed to assess and restrain the impacts of the fishery on the ecosystem.

Criteria:

1. The fishery is conducted in a way that maintains natural functional relationships among species and should not lead to trophic cascades or ecosystem state changes.
2. The fishery is conducted in a manner that does not threaten biological diversity at the genetic, species or population levels and avoids or minimizes mortality of, or injuries to endangered, threatened or protected species.
3. Where exploited populations are depleted, the fishery will be executed such that recovery and rebuilding is allowed to occur to a specified level within specified time frames, consistent with the precautionary approach and considering the ability of the population to produce long-term potential yields.

PRINCIPLE 3:

The fishery is subject to an effective management system that respects local, national and international laws and standards and incorporates institutional and operational frameworks that require use of the resource to be responsible and sustainable.

Intent:

The intent of this principle is to ensure that there is an institutional and operational framework for implementing Principles 1 and 2, appropriate to the size and scale of the fishery.

A. Management System Criteria:

1. The fishery shall not be conducted under a controversial unilateral exemption to an international agreement.

The management system shall:

2. demonstrate clear long-term objectives consistent with MSC Principles and Criteria and contain a consultative process that is transparent and involves all interested and affected parties so as to consider all relevant information, including local knowledge. The impact of fishery management decisions on all those who depend on the fishery for their livelihoods, including, but not confined to subsistence, artisanal, and fishing-dependent communities shall be addressed as part of this process;

3. be appropriate to the cultural context, scale and intensity of the fishery – reflecting specific objectives, incorporating operational criteria, containing procedures for implementation and a process for monitoring and evaluating performance and acting on findings;

4. observe the legal and customary rights and long term interests of people dependent on fishing for food and livelihood, in a manner consistent with ecological sustainability;

5. incorporates an appropriate mechanism for the resolution of disputes arising within the system³;

6. provide economic and social incentives that contribute to sustainable fishing and shall not operate with subsidies that contribute to unsustainable fishing;

7. act in a timely and adaptive fashion on the basis of the best available information using a precautionary approach particularly when dealing with scientific uncertainty;

8. incorporate a research plan – appropriate to the scale and intensity of the fishery – that addresses the information needs of management and provides for the dissemination of research results to all interested parties in a timely fashion;
9. require that assessments of the biological status of the resource and impacts of the fishery have been and are periodically conducted;
10. specify measures and strategies that demonstrably control the degree of exploitation of the resource, including, but not limited to:
 - a) setting catch levels that will maintain the target population and ecological community's high productivity relative to its potential productivity, and account for the non-target species (or size, age, sex) captured and landed in association with, or as a consequence of, fishing for target species;
 - b) identifying appropriate fishing methods that minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
 - c) providing for the recovery and rebuilding of depleted fish populations to specified levels within specified time frames;
 - d) mechanisms in place to limit or close fisheries when designated catch limits are reached;
 - e) establishing no-take zones where appropriate;
11. contains appropriate procedures for effective compliance, monitoring, control, surveillance and enforcement which ensure that established limits to exploitation are not exceeded and specifies corrective actions to be taken in the event that they are.

B. Operational Criteria

Fishing operation shall:

12. make use of fishing gear and practices designed to avoid the capture of non- target species (and non-target size, age, and/or sex of the target species); minimise mortality of this catch where it cannot be avoided, and reduce discards of what cannot be released alive;
13. implement appropriate fishing methods designed to minimise adverse impacts on habitat, especially in critical or sensitive zones such as spawning and nursery areas;
14. not use destructive fishing practices such as fishing with poisons or explosives;
15. minimise operational waste such as lost fishing gear, oil spills, on-board spoilage of catch,
16. be conducted in compliance with the fishery management system and all legal and administrative requirements; and
17. assist and co-operate with management authorities in the collection of catch, discard, and other information of importance to effective management of the resources and the fishery.

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