EMPATHY AND FISHERIES:
AN INTRODUCTION

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ABSTRACT

Over the past two decades the world of industrial fishing has undergone a period of creative reorganization resulting in an influx of potential stakeholders and a move towards an ecosystem-based approach. Traditional 20th century approaches, narrowly defined in terms of utility and efficiency, have given way to a more holistic perspective. As fisheries became redefined as an urgent environmental stewardship issue, the 'Green Agenda' has gained considerable policy-making power. The emerging philosophical tension now revolves around the underlying societal image of what fisheries stewardship should look like. By using Rifkin's (2009) thesis, this paper attempts to introduce the increasingly popular idea of empathic progress as a conceptual framework to better understand fisheries stewardship. Ultimately, the ecosystem-based approach is identified as a unifying medium that is dependent upon more collaborative forums of stakeholder participation. This paper concludes that fisheries stewardship would be better understood if redefined through an empathic model of human nature. Also, the ecosystem-based approach, in both theory and practice, can indeed be explained as a manifestation of expanding empathy as described by Rifkin (2009).

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Empathy and Fisheries: An Introduction

Empathy is the only human superpower—it can shrink distance, cut through social and power hierarchies, transcend differences, and provoke political and social change. – Elizabeth Thomas (2007)

1. Introduction

This paper will explore the somewhat unique, but increasingly important issue of empathy in fisheries management. Whether one is considering the struggle of fishers to eke out a living on the economic margins, or fish populations struggling under the synergetic effects of human progress (climate change, habitat destruction, overfishing, etc...), the study of fisheries can be likened to watching a series of interconnected high-wire acts. It was the experience of viewing a high-wire artist that German psychologist Theodore Lipps used at the dawn of the 20th century as an analogy to explain the modern idea of empathy; whereby the viewer experiences each step as if walking on the wire themselves (De Waal, 2009). Since Lipps' (1903) explanation, society's ability to perceive the struggles and vulnerabilities of the human and non-human actors in fisheries systems has increased greatly and helped shape the values and ethics that drive policy. This paper will focus on the escalating role that these values and ethics play in guiding policy and institutional change.

'Policy' may refer to any "set of decisions which are oriented towards a long-term purpose or to a particular problem" (Von Massow, V.H., 1989) which in fisheries usually involves making commitments to particular sets of management instruments (Princen,

2010). 'Institutions' can be broadly taken to mean any "humanly devised constraints that structure human interactions (rules, laws, constitutions), informal constraints (norms of behaviour, conventions, self-imposed codes of conduct) and their enforcement characteristics. Together they define the incentive structures of societies" (North, 1996... as cited in Collet, 2002, p. 538). Indeed, it is clear, as Mikalsen & Jentoft (2001) explain, that most fisheries management regimes "are not top-down hierarchies but fairly complex constellations of private interest groups and government institutions" (p. 284). However, it is also clear that for most countries, the responsibility, authority and accountability for fisheries management still lies primarily in the hands of a government ministry and professional bureaucrats.

Because of the often philosophical nature of many of the issues discussed, very little attention will be given to the day-to-day "nitty-gritty of governance activity" (Kooiman, et al., 2005, p. 19). However, paying attention to some of the underlying values and philosophies involved in fisheries policy is particularly important because philosophical shifts have the potential to "alert a new set of actors into fisheries related issues" (Princen, 2010, p. 38), who may have the collective power to radically transform the makeup of the decision-making arena (Princen, 2010).

Princen's (2010) notion of "policy images" (p. 37), or the ways the issues underlying a fisheries problem are defined are particularly useful for understanding policy and institutional change. Princen (2010) maintains that "once a specific image becomes generally accepted, some policy options are more plausible than others" (p. 37). By

providing the starting point from which issues are considered, policy images can thus shape the content of policy. Borrowing from evolutionary biology (see Eldridge & Gould, 1972), Princen (2010) argued that policy images help to explain how policy change tends to follow a 'punctuated equilibrium' of "fits and starts; long periods of stability punctuated by shorter periods of radical change" (p. 37). Policy images are closely linked to the institutional 'venues' in which policy decisions are made. Radical change happens when "the dominant image underlying the policy is successfully challenged" and "decision-making on that policy is transferred to another venue" (Princen, 2010, p. 37).

Like most policy-making institutions, national and international fisheries agencies would prefer to (and have often doggedly tried to) maintain a status quo for as long as possible so as to follow through on set objectives and allow stakeholders the stability needed for normal economic activity (Princen, 2010; Rice, 2005). However, it has led to agencies 'missing the boat' on important developments until a critical mass of societal pressure has built up to a point where incremental change is no longer adequate to meet the demand. The resultant policy changes may appear abrupt and require a period of transition (Rice, 2005).

In the scientific community, on the other hand, new ideas gain influence more slowly. It takes a long time for researchers to accumulate the data needed to support new theories and even revolutionary ones take considerable time to be accepted into the broader scientific community. Thus, science advances more incrementally. This is how,

according to (Rice, 2005) "science is out of synchrony with policy changes" (p. 265). This paper will explore the dynamics of this "asynchronous co-evolution" (Rice, 2005, p. 265) between policy and science alongside Princen's (2010) idea of policy images and venues.

This paper will explore some of the societal pressures that have led to a reframing of the underlying policy image in fisheries managment. For example, in spite of some notable exceptions (Collet, 2002; Coward, Ommer & Pitcher, 2000), ethics have received little attention in fisheries literature. Collet (2002) defined ethics as "the underlying cultural set of limitations which govern the links between people and between people and natural entities. These may be exploitative, enlightened, or communal" (p. 540). The exploitative mode is fully anthropocentric and is defined as "short-term unbridled utilitarianism" (p. 540) where profit is the only consideration. The enlightened mode is also anthropocentric and is defined as "wise productivity" (p. 540), whereby conservation is used only as a means to protect resource productivity. This mode has a hard time accounting for complexity and uncertainty in fish populations (and markets) and pays only lip service at best to social considerations (ex. livelihoods, aboriginal valuations, etc...). Finally, the communal mode is 'eco-centered' and follows an 'ecosystem approach' to ethics through which humans recognize their embeddedness in nature and thus are cognizant of an ethical responsibility to 'biotic communities' (Collet, 2002).

Today, all three ethical modes (exploitative, enlightened and communal), work together to twist and weave policy in complex ways. Over the past century, the world of fisheries

management has experienced a slow progress away from the notion of inexhaustible seas towards environmental stewardship. The emerging philosophical tension in modern fisheries revolves around the underlying societal image of what stewardship and sustainability should look like. Gray and Hatchard (2007) argued that this conflict has to do with "the foundational conception on which this environmental stewardship rests" (p. 786) which involves two conflicting images. The 'nature-conservation conception' places the preservation of ecosystems as the primary goal of stewardship and overrides economic and social considerations for the greater good of nature. The 'sustainable-development conception', on the other hand, approaches stewardship with the goal of maximizing human economic and social benefits and accepts human exploitation of ecological systems as a natural process (Gray and Hatchard, 2007). This paper will explore whether a 'reasonable balance' can be struck between the ecological, social, economic and institutional components of the 'modern concept of sustainability' (FRCC, 2005). According to the Fisheries Resource Conservation Council (FRCC, 2005), ""reasonable balance" will vary according to, *inter alia,* social preferences and societal values", and will require the "involvement, accountability, and commitment of diverse parties" (p.9).

As this paper considers some of the developments in the history of fisheries management since the Second World War, it is surmised that this history is currently being punctuated by an unprecedented change in ethical modes, images, and conceptions that is affecting the modern concept of sustainability in exciting ways . At the macro-level, these developments fit within Holling's (2001) model of an adaptive system. The industrial

fisheries system generally became too rigid in its policies during a phase of increasing exploitation which led to a significant loss of resilience at several scales (ecological, commercial, managerial, etc...). This ultimately resulted in a breaking point (i.e. fisheries failures in the early 1990s) and a release of rigidity that set the fisheries system into a creative phase of reorganization. This paper will attempt to show that the current phase of reorganization in fisheries has indeed led to a major shift forward in understanding, similar to Holling's (1993) argument that "...if we examine that pathology over a longer and larger span, examples appear where external and internal crises, amplified by the pathology, trigger a sudden lurch in understanding, a redesign and expansion of policy, and a return of flexibility and innovation (p. 554).

While techno-societal trends are sometimes briefly mentioned in fisheries literature, they are rarely explored in depth, despite the acknowledgment by some that such trends are central to the evolution of modern fisheries systems (Rammel, Stagle, & Wilfing, 2007). At the societal level, new patterns of social arrangements are emerging as second-generation 'distributed' internet technologies facilitate various forms of social networking and commerce. This surge of collaboration, 'network ways of thinking', and a more global consciousness has accelerated with the advancement and spread of these technologies (Rheingold, 2002; Rifkin, 2009). Unifying global issues, especially climate change, as well as the recent economic downturn, have led to a questioning of core economic values and a re-examination of innovative theories involving collaboration and natural capital (McDonough & Braungart, 1998; Rifkin, 2009; Wilson, 1998).

Similarly, in fisheries, new forms of multi-scale, multidisciplinary collaboration have begun to flourish around the central idea of an ecosystem-based approach to fisheries management (Charles, et al., 2009; Morishita, 2008; Varjopuro, et al., 2008). These developments fit within a broader multidisciplinary trend that has been particularly transformative in biology where "cooperative arrangements have moved from a peripheral role to a central role" (Rheingold, 2005).

This paper will consider the effect that such changes in public perception(s) and values are having on fisheries policy. There are numerous popular sources available that expound upon the virtues and pitfalls of emerging collaborative social and economic trends that might serve as useful conceptual frameworks for this goal (De Waal, 2009; Freidman, 2006; Goleman, 2009; Hawken, Lovins, & Lovins, 1999; Hedges, 2010; Pinker, 2011; Rheingold, 2002; Tapscott & Williams, 2006). In this instance, Rifkin's (2009) *The Empathic Civilization* was chosen because most of the popular trends and ideas about human values, technologies and collaboration are included within its sweeping interdisciplinary scope. My intention is to introduce Rifkin's (2009) simple yet profound thesis of empathy to the field of fisheries management as an important cultural template through which to frame future, more directed research.

According to Rifkin's (2009) thesis (analogous to Singer, 1981), the true basis of human nature is a drive towards increasing socialization and expanding empathy. Increased socialization, in the form of individual relationships, expands empathic consciousness within a civilization. Rifkin (2009) argued that this has been the true story of human

progress as a series of energy and communication revolutions have continually widened social boundaries and led to an increase in socialization and an expansion of empathic experience and consciousness.

Each successive energy/communications complex required the use of increasing amounts of energy and other resources and thus has an ever-growing 'entropy bill'. This means that empathic expansion paradoxically places more and more stress on the environment (i.e. increasing empathy has historically come by means of increasing cultural, technological and economic connectivity that is made possible by intensifying natural resource exploitation/depletion and environmental degradation). At the apex of Rifkin's (2009) theory of empathic development is "biosphere consciousness" (p. 475) whereby, after the potential for human social relationships has come to include the entirety of the diverse human population, it extends its social network into the non-human realm, facilitating the empathic experience to other creatures, ecosystems and the biosphere. The realization of this transition is far from certain and is dependent upon the mass utilization of new 'distributed' forms of communications, commerce and energy. Rifkin (2009) argued that the struggle to help bring forward a biosphere consciousness is of fundamental importance to human survival because it may be the key to breaking "the lock that shackles increasing empathy to increasing entropy" (p. 593), thus allowing for the understanding and cooperation required to tackle global crises, like climate change, to emerge (Rifkin, 2009).

I will argue that empathic development will be a key factor in deciding which conception of environmental stewardship will most influence fisheries policy in the future. This discussion is a significant one because at the extreme ends of the conceptual spectrum we find the ultimate end of wild capture fisheries as a viable livelihood in most countries. Over the past two decades the world of fisheries management has become aware that, if 'sustainable development' continues on without a true appreciation of the complexity and importance of ecosystems, the mass collapse of commercial species will result. On the other hand, if the nature-conservation movement achieves total dominance, marine protected areas may be the only management option available as all fishing and seafood consumption becomes widely accepted as unethical.

2. 20th Century Fisheries Ideology: Managing with 'Sticks and Carrots'

> *Such failure is an inevitable consequence of a contradiction between human desires and human capabilities. The usual result is a magical theory that purports to satisfy unlimited human populations and unlimited per capita consumption with limited resources: the miracle of the loaves and fishes has become an objective of policy.* —Donald Ludwig (1993)

Several researchers, coming from different disciplines of study, have converged on the idea that the history of modern fishery management has shown a kind of obsessive compulsive disorder or "tunnel vision" (Degnbol, et al., 2006, p. 534) whereby particularly narrow definitions of key concepts have become entrenched. As these key

concepts, such as 'sustainability' (Charles, 2005) and 'property' (Mansfield, 2007) evolved, they were continually roughed up by the realities of complex ecological and human systems that were, of course, also changing. This process has resulted in a field of resource management that is specific to fisheries (Garcia & Charles, 2007; Mansfield, 2004).

Much of the theory of modern resource management is still hung-over from the utilitarian ethos of the Enlightenment and the efficiency obsession of the Progressive Era (i.e. the nation-state, laissez-faire economic rationale exemplified by simplified readings of: John Locke's notion that humans are inherently predisposed to acquire property, Adam Smith's presumption of autonomy and the 'invisible hand', Jeremy Bentham's ideas on utilitarianism and 'the greatest good', Charles Darwin's theory of 'survival of the fittest', Sigmund Freud's obsession with the 'libido' as the central motivator, etc…) (De Waal, 2009; Rifkin, 2009; Haber, 1973; Hays, 1959). This hangover has been particularly prevalent during the modern age of industrial fishing where the exploitative mode has largely prevailed.

The obsession with efficiency in fisheries management reached an apex with the theory of Maximum Sustained Yield (MSY) thanks to contributions from Ricker (1948), Schaefer (1954), Beverton & Holt (1957), and others (see Larkin, 1977). More holistic approaches from freshwater limnology, which studied complex communities of aquatic organisms, were pushed aside by a new obsession with single-species population dynamics (Larkin, 1977). Larkin (1977) described MSY:

> Briefly, the dogma was this: any species each year produces a harvestable surplus, and if you take that much, and no more, you can go on getting it forever and ever (Amen). You only need to have as much effort as is necessary to catch this magic amount, so to use more is wasteful of effort; to use less is wasteful of food. (Larkin 1977, p.1).

Early proponents of MSY seemed to have pushed for its acceptance as an organizing philosophy for international fisheries policy before any unifying mathematical or biological justifications were clearly presented. This is reflective of the fact that the reasons for the initial establishment of MSY may be, as Finley (2009) argued, "...owed more to justifying a political and economic agenda than it did to sustaining fish stocks" (p. 10).

In the jurisdictional repositioning during the early post-war years, international fisheries became a diplomatic battleground in which U.S. hegemony played a central role (Smith, 2008). In spite of the second Truman Proclamation (i.e. the *Policy of the United States with Respect to Coastal Fisheries in Certain Areas of the High Seas*, 1945), the geopolitical interests of the U.S. were generally for 'open sea and open skies' and U.S. fisheries policy objectives were no exception (e.g. the American Pacific high seas tuna and baitfish fisheries were under threat from moves towards binding regulations and extended jurisdiction in Latin America). Throughout this period the U.S. advocated for MSY as the scientific basis of fisheries management because it reinforced the idea of a potential surplus crop of fish that would be wasted if extended jurisdiction prevented the full utilization of fisheries resources by industrialized nations. Freedom of the seas could be upheld because sound conservation was possible via the scientific efficiency of MSY.

Beginning with its adoption at the FAO Rome Conference in 1955, MSY became institutionally entrenched as a fisheries policy and legal instrument that was propped up by its scientific underpinnings (Finley, 2011; Finley, 2009).

From the mid-20th-century onward then, there was an almost fanatical belief in the world of fisheries science and management in a kind of biotechnical 'invisible hand'. MSY was the ultimate in efficiency and was thus thought to inherently lead to the greatest good. However, the "maximum" in MSY, as Ludwig (1993, p. 556) pointed out, is particularly revealing in the way it reflects on how the target level of exploitation seems based on a kind of laissez-faire economic ethics. Furthermore, the conventional definition of "sustainable yield" and its progeny 'total allowable catch' (TAC), according to Charles (2005), "has led to overly-narrow conceptions of 'sustainable development' and of fishery sustainability" that rely too heavily on an intrinsic stability in the system (Charles, 2005, p. 2). This over-dependence on target reference points like MSY resulted in a "fallacy of controllability" (Charles, 2005, p. 4) that has been blamed for various fisheries collapses. Ultimately, the approach failed to capture the complexity of ecosystems – i.e. the influence of predator-prey relationships and the impact of changes in the marine environment (Larkin, 1977; Morishita, 2008; Varjopuro, et al., 2008).

Neoclassical economic theory also began to play an increasingly influential role in the field of fisheries management in the 1950s with immensely influential papers from Gordon (1954) and Scott (1955). These authors incorporated Schaefer's (1954) concept of surplus production and sustained yield with the revenue curve to expand on Graham's

(1935) theory that the same quantity of harvest could be obtained at two different levels of fishing effort (Larkin, 1977).

These developments brought an added level of complexity into the mix and introduced more 'human' considerations into the biological domain of fisheries science, which Gordon (1954) criticized for treating fishermen as 'exogenous elements' in 'analytical models'. However, from the beginning this new marriage was built upon a vow to the neoclassical economic ethos that self-interest is the primary driver of human socialization and might thus (perhaps a little pessimistically) be viewed as just a further sharpening of 'Occam's razor' by the 'invisible hand'. Gordon (1954) used a "valid behaviouristic generalization" (p. 91) of fishing activities to explain how fisheries are generally overexploited to a point where all the economic rent is dissipated. This overexploitation behaviour was a response to the common-property nature of the resource:

> wealth that is free for all is valued by none because he who is foolhardy enough to wait for its proper time of use will only find that it has been taken by another… the fish in the sea are valueless to the fisherman, because there is no assurance that they will be there for him tomorrow if they are left behind today (Gordon, 2954, p. 135).

Imposing private property seemed the natural solution. Scott (1955) argued that Gordon's common property dilemma could be cured by moving beyond mere governmental management to a kind of "sole ownership" that gave the fisherman "permanent tenure" (p. 121) which in turn introduced a kind of capital theoretic rationality. The 'sole ownership' approach came to maturity in recent decades with the emergence of Individual Transferable Quotas (ITQs). ITQs privatize fishing rights in an

effort to create more efficiency but also produce "the incentive to fill the quotas as much as possible" according to Copes (1998), "with a high value grade of fish from the target species in order to maximize net revenue from a quantitatively limited species catch" (p. 20).

From mid-century onward then, fisheries management became obsessed with the 'common-property' nature of fisheries and the search to come up with management measures that would harness fishermen's self-interest, thus finding an appropriate prosthetic device to allow the 'invisible hand' to work efficiently. The movement was held together more by the "elegance and aesthetics" (Nelson, 1995, as quoted in Rammel, et al., 2007) of economic equilibrium models than their ability to truly represent the complexity of fisheries systems. This obsession, according to Mansfield (2004), created a form of economics for fisheries that was grounded on "a particular perspective that links property specifically to market rationality" (p. 313). Subsequently, more sophisticated arguments for sole ownership style approaches, as well as some interesting private/social hybrids have developed that are largely based on the ethical grounds of ecological stewardship or social justice via the utilitarianism of the market (for example, see Mansfield, 2007, on the 'multiple logics' of Western Alaska Community Development Quotas).

Nevertheless, it still seems impossible to identify a more frequently cited explanatory source in the world of fisheries management than Hardin's (1968) *The Tragedy of The Commons* theory that (analogous to Gordon (1954)) declared that: "ruin is the destination

toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all" (Hardin, 1968, p. 1244).

For a long time (e.g. Grotius' publication of *Mare Liberum* in 1609) ocean property has been viewed as rather 'inappropriable' and, until quite recently, 'inexhaustible', and thus unique in terms of international law and policy (Johnson, 1965; Smith, 2008). In Hardin (1968), we see the issue of resource conservation introduced to *mare liberum* through a culturally biased lens... As Palsson, (1991...quoting McEvoy, 1987) noted:

> Hardin's thesis [1968] of the tragedy of the commons represents a "mythology" of resource use, a model "in narrative form for the genesis and essence of environmental problems." The claim that access to the ocean is open for everyone in most fishing societies, and that this is the root of all environmental problems, needs to be qualified... The theory of the tragedy of the commons, then, is an important means for making history, an authoritative claim with a social force of its own, and not simply an attempt to understand the world (p. 154).

In this interpretation we can see one way in which the vast ocean environment has the potential to function as a "theory machine" that "stimulates theoretical formulation" (Helmreich, 2011, p. 1548). It is a forum that is creative and dialectic. As our 'mental picture' of the ocean continues to expand, from straight-lined grids drawn over a murky abyss to dynamic flows of complex webs of life, this productive potential increases.

In recent decades, of course, cooperative institutions and stable forums of communication have been identified as potential remedies to the tragedy of the commons dilemma and as alternatives to traditional 'sole ownership' types of privatization. It is unclear what

influence the lingering 'colonial mindset' has had in creating barriers to the consideration of the 'traditional' approaches to resource management that have been introduced to the field in recent decades (Gadgil, Berkes, & Folke, 1993; Ostrom, 1991). Nonetheless, this broadening of perspective to include more diverse approaches to the commons issue can be viewed as an expansion of ethical and empathic boundaries. The result has been a step away from the exploitative and 'enlightened' modes of ethics towards the communal (Collet, 2002; Rifkin, 2009).

As this discussion of the development of modern fisheries management continues, it is important to remember that this evolution was influenced by other broader histories. Unfortunately, as has been discussed, neo-classical resource economics has dealt with complex natural systems through the lens of what Rammel, et al., (2007) referred to as "myopic optimization" (p.10), and an "a-historic worldview" (p. 9). Meanwhile, broader social histories have unfolded amidst a series of increasingly sophisticated communications revolutions (telegraph, radio, telephone, television, internet, web 2.0, etc...) bringing together "more diverse people in increasingly more expansive and dense social networks" (Rifkin, 2009, p. 37). Rifkin (2009) argued that, because of the speed at which modern information and communications technologies facilitate virtual relationships and network-thinking, the world is in the midst of "the greatest surge in empathic extension in all of human history" (p. 452). This extension involves a fundamental restructuring of our understanding of human nature; away from the single "mine-vs.-thine" (p. 536) utilitarian formula (expressed in fisheries via the pervasive

influence of neo-classical economics) towards one that embraces complexity and places cooperation at its base.

3. The Ecosystem-based Approach

> *"...it is these times of greatest threat that offer the greatest opportunity, because many constraints have been removed."*
> – C.S. Holling (2001, p. 402).

3.1. Moving Towards Ecosystem Management

While in 1982 the UN Convention on the Law of the Sea briefly mentioned "the interdependence of fish stocks" (Morishita, 2008, p. 20; UNCLOS, 1982), by 1995, the UN Fish Stock Agreement (UNFSA) addressed the need to conserve "biodiversity" and other species "belonging to the same ecosystem or associated with or dependent upon the target stocks" (Morishita, 2008, p. 20, UNFSA, Art. 5, 1995). The shift away from the single-species approach was well underway.

In the early 1990s a series of international conventions, including the Convention on Biological Diversity (CBD) (coming out of the Rio Earth Summit (1992)) and the FAO Code of Conduct for Responsible Fishing (initiated 1991, adopted 1995), enlisted the theory of biodiversity as "a global benchmark for successful fisheries management..."

(Benson, 2009, p. 33; Princen, 2010). The CBD provides a popular (Benson, 2009) definition of biodiversity as: "the variability among living organisms from all sources including terrestrial, marine and other aquatic ecosystems, and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems..."(CBD, 1992, Art. 2). The FAO Code of Conduct really contained the basis for future international ecosystem-based fisheries management (CIEAF, 2006; FAO, 1995; FAO, 2003). According to Pitcher, et al. (2009), although the Code "originated in the early 1990s before ecosystem thinking became widespread, it provides a very robust scheme of key elements such as ecological health, stakeholder involvement and spatial management" (p. 223).

Meanwhile, during the 1990s, the world's attention turned increasingly towards environmental issues. While much of the current discussion about biodiversity centers on its potential to affect resilience, the original writings were also about introducing valuations on living systems and their components that might act as conceptual starting points for wise management (whether that valuation be economic, social, ethical, etc...). This dialogue sparked new directions for scientific, social and economic research (Wilson & Peter, 1998).

Ecosystem-based management may fall under "a bewildering number of different definitions and shades of meaning" (Pitcher, 2009, p. 223), abbreviations (EA, EBFM, EAM, etc…) and degrees of specificity (Morishita, 2008). For the general purposes of this discussion I will refer to the ecosystem-based approach as broadly as possible by

adopting Gray & Hatchard's (2008) definition as "any attempt at a holistic approach to fisheries management, irrespective of its objectives" (p. 159). This definition is closely aligned with Charles', et al. (2009) fisheries systems approach which incorporates systems theory into fisheries management and considers a broad range of ecological, institutional, social and economic indicators to frame fisheries management decisions within the 'big picture' perspective. Subsequently, the identification of measurable fisheries indicators has become accepted as an important step in the design of ecosystem-based management frameworks for real-world application (Charles, et al. 2009; Charles, 2005; Pitcher, et al., 2009). Regardless of the definition, there are generally two innovative and expansive features of the ecosystem-based approach. Firstly, it seeks knowledge about the functioning of, and human impact upon, the whole ecosystem. Secondly, it removes, or at least dilutes, the arbitrary boundaries between the different systems (social, economic, ecological) involved in fisheries management in order to design a management framework (Folke, Hahn, Olsson & Norberg, 2005).

The ecosystem-based approach can be seen in measures like by-catch mitigation, multi-species management, protection of vulnerable ecosystems, participatory management and integrated approaches that consider the influence of changes in the marine environment (Morishita, 2008). The way any given country comes to adopt ecosystem-based management varies considerably. However, in general, the integration of ecosystem-based principals comes first. These might include the commitment to protect biodiversity, the incorporation of human valuations of ecosystems (including social and cultural), the acceptance of the dynamic nature of ecosystems, etc... A clear ecosystem-

based nomenclature must be worked out and worked into the policy language. During and following this process, ecosystem issues (ecological, social, economic, etc...) must be identified from the fisheries system and indicators to measure success for these issues agreed upon. Also, the geographical area for ecosystem management must be agreed upon. These steps require stakeholder participation, the identification of research needs, the development of a monitoring/feedback system and a means to prioritize the issues and indicators identified in order to effectively direct scarce management resources (Fletcher, et al., 2010; Pitcher, et al., 2009).

3.2. A Collaborative Imperative

It is generally accepted that, at least to a degree, the more diversity (for example, biodiversity, cultural diversity or institutional diversity) that is maintained within a system, the more resilient it will be to sudden shocks and changes (Becker & Ostrum, 1995; Charles, 2009; Gibbs, 2009). Folke et al. (2005) defined resilience as "the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks" (p. 443). By imposing fixed, narrowly-focused and un-evolving management measures in an attempt to stabilize naturally dynamic resource variables, humans have generally made natural systems less resilient (Charles, 2009; Gibbs, 2009; Holling, 1993, Holling, 2001). Through the emergence of the ecosystem-based approach, with its requirement for a more expansive and interactive way of looking at the world; one that sees diversity as a

prerequisite for resilience, fisheries management is experiencing a quantum leap forward in its approach towards understanding the realities of fisheries systems.

The ecosystem-based approach can be seen as an attempt to face the complexity and uncertainty of the real world through the safety-net of the 'precautionary principle', which maintains that: "where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation" (Rio Declaration, Chapter 15, 1992... as quoted in Gonzalez-Laxe, 2005, p. 495). One of the main challenges to the ecosystem-based approaches progress will be "how to balance knowledge and precaution" (CIEAF, 2006, p. 22) in order to make timely management decisions in an expanding ecosystem-based operational network. In this early stage of adopting the ecosystem-based approach we are faced with the transitional question of whether the goal of fisheries policy is to "manage change or adapt to it" (Gray & Hatchard, 2008, p.158).

Ecosystems are incredibly complicated to model or incorporate into management plans and there must be some "trade-off between realism and simplicity" (Garcia & Charles, 2007, p. 582). Compared with engineering systems, for example, Garcia & Charles (2007) explain that "fisheries systems are typically inherently more variable, functionally more diverse, more hierarchically organized, and potentially capable of self-organization." (p. 582). Initially, ecosystem models were supposed to create less uncertain, 'big picture' results, but instead introduced more uncertainly (Rice, 2005). This was a problem because it was realized that, in a volatile decision-making

environment, the management system must be able to adapt quickly enough in order for precaution to actually be maintained (Curtin & Prellezo, 2010).

The incorporation of 'adaptive management' into the ecosystem-based approach is a central way that it differs from previous management models (Curtin & Prellezo, 2010). As described by Allen et al. (2011): "Adaptive management, often characterized as 'learning by doing', is a formal iterative process of resource management that acknowledges uncertainty and achieves management objectives by increasing system knowledge through a structured feedback process" (Allen, et al., 2011, p. 1340). When adaptive management works, policies become "hypothesis" and management actions become "experiments" (Folke, et al., 2005, p. 447) for learning how to adapt to change.

Because of the high demand for divergent, cross-scale information (to maintain a 'structured feedback process'), it is implicit that adaptive ecosystem-based approaches require collaboration as well as an element of 'social learning'. Reed et al. (2010) defined social learning as "a change in understanding that goes beyond the individual to become situated within wider social units or communities of practice through social interactions between actors within social networks" (p. 6). Through this process a storehouse of knowledge or 'social memory' may be amassed over time that can be called upon during periods of major disturbances (Folke, et al., 2005).

Thanks to ecosystem-based thinking, it is ultimately becoming more and more acceptable to look at natural resource systems, including fisheries, as complex adaptive systems (Holling, 2001; Rammel et al., 2007). Complex adaptive systems are made up of a

'plexus' of interconnected behavioural, institutional and ecological sub-systems (similar to Hollings, 2001, idea of 'nested sets' of adaptive cycles). The whole system continually adapts through a process of co-evolution amongst its many irreversibly evolving and interconnected subsystems (Rammel et al., 2007). By incorporating structured adaptive management and social learning, the ecosystem-based approach may ultimately lead to a more timely and better understood co-evolution of policies (and their underlying images and values) within the broader (ecological, human behavioural, institutional, etc...) fisheries system. In essence, these developments provide a basis for a resurgence and radical expansion of a long-suppressed communal mode of management that may have been characteristic of pre-industrial fisheries.

4. The Green Agenda

4.1. An Environmental Issue

Throughout the 1980s fisheries issues received little attention outside of the industry. Media coverage and public interest remained low; interrupted by a short-lived crisis from time to time. By the early 1990s, however, public interest in fisheries began to increase thanks to a series of major stock collapses and the 'overfishing issue' began receiving more and more media coverage (Mikalsen & Jentoft, 2001). As this section will show, the change in public perspective was part of a broader trend in fisheries whereby, what Princen (2010) referred to as "the dominant image" (p. 37) underlying fisheries policy

was successfully challenged. This change in the policy image has the potential to lead to a transfer of decision-making to another venue.

Generally speaking, during the 1990s the media became very negative towards the fishing industry and fisheries management. While local and regional media were somewhat less critical (tending to blame national bureaucracies or foreign overfishing for resource problems), negative coverage of industrial fishing continued to escalate, leading to a deterioration of the public image of the industry and its participants (Oliver, 2005)... As Oliver (2005) explained:

> Until recent times, the public, in general, regarded fishermen with a mixture of respect and admiration. They were almost heroic figures, who braved the elements and did a physically arduous and dangerous job under difficult conditions to put high protein food on people's tables. . . . Many people, and especially young people, now see fishermen as greedy, self interested pirates who plunder the oceans with powerful and technically sophisticated vessels and equipment, without a thought for the marine environment or for future generations of fishermen (Oliver, 2005, p. 219).

This intensifying negative publicity toward the fishing industry (including science and management) over the resource crisis opened up a space in the public's view for increasing environmental conservation and activism. This new environmental urgency led to changes across the entire management arena (Mikalsen & Jentoft, 2001).

Indeed, the 1990s saw the rapid reframing of fisheries management into an environmental conservation issue (Mikalsen & Jentoft, 2001). There was a consensus rapidly building amongst the scientific community that industrial fisheries were capable of causing major environmental harm. This change in the dominant scientific perspective was interrelated

to the appearance of the ecosystem-based approach which linked target fish stocks to the wider environment. There were also a series of international and regional environmental conferences and conventions that helped to reframe fisheries as an environmental issue by adopting the language and approaches of biodiversity-centered environmental management. National fisheries ministries also began to adopt the biodiversity perspective to the point where there was growing "evidence of action to prioritize environmental objectives over commercial objectives" (Gray & Hatchard, 2007, p. 788; Hernes & Mikalsen, 1999).

This growing sense of urgency created an opportunity for environmental non-governmental organizations (ENGOs) to rise to a new role as active stakeholders. According to a model of stakeholder identification designed by Mitchell, et al. (1997), stakeholders who command the three attributes of legitimacy, urgency and power simultaneously will be the top priority for the dominant policy-making agency involved. At the bottom of the model there are latent stakeholders who have only one of these three attributes and are thus unlikely to receive any attention from the dominant institution until they are able to gain another attribute (Mitchel, et al., 1997... as cited in Mikalsen & Jentoft, 2001). Fisheries policy then, was being redefined as part of a global environmental crisis (urgency), that had a growing scientific consensus (legitimacy), and an increasingly concerned and frustrated public (potential political power) behind it (Dunn, 2005: Mikalsen & Jentoft, 2001).

While the earliest campaigns against sealing and whaling in the 1970s and 1980s raised the profile of some activist groups and their cause of animal welfare, their radical approach also created a public image of them as "extremist, militant, confrontational and highly ideological" (Hernes & Mikalsen, 1999, p. 2). The new sense of environmental urgency and legitimacy in the early 1990s however, opened the door for other, more pragmatic, non-animal rights, ENGOs that were seen as more 'mainstream' and professional alongside the radical animal rights movement.

In fact, environmentalism itself was undergoing a significant restructuring as it moved from "campaigning for 'problem identification' to collaborating in 'problem solving'" (Dunn, 2005, p. 209). Many ENGOs, and especially the larger, more established ones, like the World Wildlife Fund (WWF), were evolving to adopt pragmatic approaches based on a strategy of 'political diversification'. For example, WWF-Canada was granted observer status at the North Atlantic Fisheries Organization (NAFO) in 2006. It has provided independent scientific advice on NAFO's oceans reform policy and, according to Short, Graham & Grieve (2008), intends to "strengthen relations with decision makers, engaging them on the need to reduce cod by-catch and implement EBM" (p. 83).

While direct action and negative media campaigns remained an important activity of ENGOs, for many successful organizations it became a secondary element, meant to balance public perceptions and maintain credibility. Mainstream environmentalism soon

became almost entirely institutionally focused, relying heavily on research and extensive lobbying (Dunn, 2005; Gray & Hatchard, 2007; Hernes & Mikalsen, 1999).

There are, however, many divisions amongst the everyday citizens, activists, ENGO's, scientists, and industry professionals that make up the fisheries environmental movement. For example, there remains a considerable philosophical divide between those individuals and groups who advocate for animal rights and those involved in the more 'mainstream' environmental movement (discussed below). More generally, there exist a divide between the ecocentric nature-conservation conception of marine stewardship and the sustainable development conception (Gray and Hatchard, 2007). Such divides are not surprising given growing diversity of stakeholder interests and the "lack of actual exposure to the ocean's material nature" (Steinberg, 2008, p. 2095). Yet, these divides may not run as deep as they appear on the surface. They likely rest upon a tension between idealistic interpretations of stewardship versus pragmatic ones, while the common goals of sustainability and diversity are still shared for most.

The emergence of and debate over marine eco-labelling initiatives, particularly the Marine Stewardship Council (MSC), is an example of such divisions amongst the green (or 'blue') agenda. The MSC (founded out of a joint-initiative between the WWF and food industry giant Unilever in 1996) now oversees an independently conducted and transparent certification process that ultimately provides a blue eco-label to go on seafood packaging to certify that the fishery it came from met certain environmental criteria that ensures its sustainability. The MSC also has a chain of custody program that certifies the

traceability of a seafood product from the time of capture to when it's sold for consumption (Greenpeace, 2009; MSC, 2011).

Some researchers, like Jacquet & Pauly (2010), and ENGOS like Greenpeace (2009), have been highly critical of the MSC certification process. They have been disapproving of the MSC for shortcomings in its traceability program and for the certification of fisheries that have shown large population declines in the target species or that have used destructive techniques like bottom trawling. They have also criticized the MSC for certifying mostly large, capital-intensive industrial fisheries as opposed to small-scale operations and have noted significant barriers to certification for fisheries in poor countries (Greenpeace, 2009; Jacquet & Pauly, 2007; Jacquet & Pauly, 2008; Jacquet & Pauly, 2010). Supporters of MSC, on the other hand, argue that it can harness public/consumer interest, provide economic incentives for good stewardship, lead to the use of more selective gear, improve monitoring and research, etc... (e.g. see Hilborn, 2010). The disagreements over MSC have been largely about its particular certification criteria and performance and not over its underlying philosophy that is firmly rooted in the sustainable development conception of stewardship. These divisions are illustrative of an idealistic interpretation of ecosystem management versus a pragmatic one.

While still corporatist in nature, there is an inroad of individualism in the MSC idea that makes it both appealing and yet somehow unsettling, depending upon what ideological starting point it is considered from. Regardless, any step beyond ideology (even this very small one) is likely a positive development for fisheries management. Here we see how

the ocean is a 'theory machine' that is not simply "an arena of political contestation but a space that is saturated with social processes and cultural resonances" (Steinberg, 2008, p. 2092). It is the position of this paper that the rise of the green agenda and the ecosystem-based approach is bringing about a far-reaching societal consensus that is best described as a cultural process.

4.2. 'Dramaturgical Consciousness'

Rifkin (2009) argued that moving imagery, especially film, played an important role in raising concern for the environment and nonhuman beings. Research into the ways that radio and television were allowing people to develop strong emotional relationships with, or to take on the roles of, the characters they were seeing and hearing, began in the 1950s. These "parasocial relationships" (p. 555) provided a training ground for exploring new relationships and vicariously allowed for increased socialization to a broader range of characters (including some animals) that would be possible in someone's regular life (Rifkin, 2009).

It seems that we increasingly interpret the world in more audiovisual than literary ways. According to Lorimer (2010), 'transmedia ecologies' of moving imagery have become the primary spaces where most people are exposed to far-away peoples, nonhumans and environments. Film "frames our 'optical unconsciousness' organizing the horizons of the visible and the sensible" and can "powerfully configure popular political landscapes" (Lorimer, 2010, p. 241).

Today, the internet is changing parasocial relationships to 'peer-to-peer' and is making possible what Rifkin (2009) calls "dramaturgical consciousness" (p. 555). As Rifkin (2009) explained: "The whole world might well have been a stage, but during the 20th Century most of the people were in the audience, whereas in the 21st Century everyone is onstage and in front of the spotlight, thanks to YouTube, MySpace, Facebook, the blogosphere, et al." (p. 555). Hardin (1968) was correct, at the time, when he argued that: "it is as tempting to ecologists as it is to reformers in general to try to persuade others by way of the photographic shortcut. But the essence of an argument cannot be photographed: it must be presented rationally -in words" (p. 1245). However, this argument is weakening.

The rise of dramaturgical consciousness may have a game-changing influence on fisheries policy as a wide range of new stakeholders, who might not necessarily be involved with any established ENGOs, can now, as individual citizens with concerns about ethical consumerism, ocean pollution, biodiversity loss, etc..., use the 'digital commons' as a medium to politicize their cause. As Rheingold (2005) explained, "In the many-to-many era, every desktop is now a printing press, a broadcasting station, a community, or a marketplace". Furthermore, there has been an increase in collective action addressing environmental issues that is organized online, but also a boom in ego-driven, narcissistic pursuits (Freidman, 2006; Hedges, 2009; Maich & George, 2009). Regardless of the intentions, the ultimate result is the elevation of role playing as a form of consciousness for the internet generation (Rifkin, 2009).

The rising dominance of the green agenda in fisheries might also be considered in relation to the evolution of public values that have come with changing demographics. Urbanization has become a major global trend. In Canada, for example, nearly 90% of the total population growth since 2001 has occurred in cites (Statistics Canada, 2008). This urban drift has led to a change in societal attitudes as racial, religious, ethnic, sexual, and other forms of diversity become more accepted. Rifkin (2009) argued that "traditional boundaries separating people are beginning to give way to a more cosmopolitan sensibility, and with it, the extension of empathic consciousness to wholly new domains" (p. 466). This cosmopolitan sensibility translates into a move away from the 'American dream' model of individual success towards a 'European dream' that is based more on a 'quality of life' perspective (i.e. healthy functioning communities, ethical food, self-expression, civil society issues, etc...).

Cosmopolitanism is also synonymous with environmentalism and Rifkin (2009) argues that, statistically, "the Internet generation consistently outpaces their older cohorts" (543) when it comes to *inter alia*, sensitivity to the plight of other creatures. Lifestyles do seem to be changing to reflect these growing concerns. In the US, for example, hunting has declined significantly in recent decades whereas wildlife watching has grown rapidly (Pinker, 2011).

As mentioned, in fisheries governance today there is a growing tension between the 'nature-conservation conception' of stewardship, which places the protection of the ecosystem over the protection of industry, and the 'sustainable-development conception'

that see humans as an active part of evolving ecosystems (Gray & Hatchard, 2007). While both conceptions are part of the cosmopolitan sensibility, at its most advanced level the nature-conservation conception is probably dominant (and perhaps a harbinger of things to come) (Rifkin, 2009).

5. From Fisheries Management to Governance

5.1. The 'Participatory Paradox'

> *Policy making is not a case of groups begging government to let them in, but of government trying to make use of what exists in the group society.*
> –Maloney, et al. (1994)

As the green agenda became increasingly sophisticated and successful, the traditional 20th century fisheries management arrangement whereby fisheries was a "closed shop" (Dunn, 2005, p. 210), structured around a 'privileged' relationship between industry and government became increasingly challenged by a rapid increase in potential stakeholders (Hernes & Mikalsen, 1999). By the late 1990s, fisheries reform moved from trying to find ways to facilitate user-group participation in decision-making (i.e. co-management) to increasingly having to include non-user interests as well (fisheries governance). Policy makers were faced with a challenge of 'institutional design' in order to accommodate

many new interests that were becoming too political to ignore (Mikalsen & Jentoft, 2001).

A major paradigm shift, "from fisheries management to fisheries governance" (Symes, 2006, p. 114), was underway. This move can be viewed as part of a growing interdisciplinarity within the field as well as the wider process of decentralization and devolution that began in the 1980s across Western societies and the continuing trend away from traditional party political involvement (Symes, 2006). While shaped by the domineering influence of neoliberal ideology, the move towards fisheries governance still marked a shift away from top-down/command-and-control management with its prescriptive 'carrot and stick approaches' towards a complex participatory paradigm. This "melting-pot-concept" as Suarez de Vivero (2008, p. 323) put it, has "collective knowledge", "social consensus", "self-coordination", and "post-materialist" foundations (p. 323).

It seemed that the 'institutional innovation' required for effective ecosystem-based adaptive management was well underway. However, there have been many challenges thus far to facilitating the influx of stakeholder participants. For most industrialized fishing nations the relaxing of centralized government control has not led to the institutional and structural adaptation needed for managing complex fisheries systems. The assumption that increasing stakeholder participation will automatically lead to social learning and adaptive management may be, to put it mildly, premature. This is partly because the costs often associated with cross-scale interactions tend to lead to a

monopolization of information and power by dominating institutions which can create distrust in the governance system (Adger, 2006; Reed et al., 2010).

Instead of truly open collaboration, an age-old dichotomy has often emerged, with laissez-faire/private property solutions (like ITQs) in one camp and the more diffuse semi-participatory processes (like 'cooperative management') in the other (Suarez de Vivero, et al., 2008). On one side, according to Suarez de Vivero, et al. (2008), are processes that are linked to "large transnational companies and strong economic lobbies, with the more social aspects being somewhat sidelined" (p. 334). On the other side, an increase in the number of actors involved in co-management can introduce new power dynamics that lead to "accountability being more and more diffusely spread, and producer participation diluted into a wide and complex spectrum of social actors" (Suarez de Vivero, et al., 2008, p. 324). The challenge then, became to increase the number of participants in the decision-making process without slowing it down, diluting it, or allowing for the marginalization of important stakeholders (Mikalsen & Jentoft, 2008).

This "participation paradox" (Suarez de Vivero, et al., 2008, p. 319) indeed highlights the need for institutional innovation. However, the innovation that the ecosystem approach demands, requires the accommodation of an accelerated and structured social learning process. This kind of innovation, according to Berghofer, et al. (2008), "cannot be planned according to blueprint insights from indicators, or the analysis of rules or political traditions. Instead, they will have to emerge from an interactive process of stakeholder participation" (p. 245).

Traditional top-down, command-and control institutions 'impose' a regulatory framework on stakeholders and may be "impervious to feedback or learning from resource users and civil society" (Adger, 2006, p. 2). Without this feedback, institutions run the risk of stifling innovation. They may become stuck in the 'status quo' while other actors (for example ENGOs), may pool important knowledge and reframe the policy image to increase control over the decision-making venue (Adger, 2006; Princen, 2010; Reed, et al., 2010).

Interestingly, this whole process may have come full circle to a point where the industry and traditional management institutions are at risk of falling under the top-down, prescriptive command of the 'nature-conservation conception' that is advocated by a large contingent of the scientific and ENGO community(s). According to Gray & Hatchard (2007) "this claim rests on the assertion that decision-makers are so influenced by the green agenda that environmentalism now exerts hegemonic power over the fishing industry and fisheries policy" (Gray & Hatchard, 2007, p. 780). To prevent this, they argue, the industry must build upon a "platform of already existing endorsements of the 'sustainable development conception' of environmental stewardship" (p. 790), that must utilize a more cooperative, bottom-up governance structure (Gray & Hatchard, 2007).

5.2. Challenges to the Ecosystem-based Approach

As mentioned above, there was a convergence of international environmental and fisheries management objectives that took place in the early 1990s. This convergence

was preceded by a stage of rising environmental awareness that began in the 1970s with the Stockholm Conference (1972) and culminated with the Rio Summit in 1992. By the mid 1990s several countries had moved into a stage of implementation of the new environmental/biodiversity-focused approach to natural resource management. The main means of implementation for fisheries management has been the ecosystem-based approach (Bianchi, 2009).

The implementation of the ecosystem-based approach to fisheries management suffered considerable inertia early on. The early 2000s saw attempts at the further clarification of general principals, for example, at the Conference on Responsible Fisheries in Reykjavik in 2001 and the World Summit on Sustainable Development in Johannesburg in 2002. The scientific community had long advocated for the ecosystem-based approach as a response to urgent environmental problems, however, as Rice (2005) explained, it had "merely been indicating the necessary direction of change" (p. 267). After the policy environment changed and embraced the principals of the ecosystem approach, it became clear that science was not ready to provide the hard advice needed for implementation. Policy was now 'ahead' of science and faced a wall of complexity and uncertainty (Bianchi, 2009; Rice, 2005). Fisheries managers attempted to muddle through endless definitions, to decide what indicators to use and how to apply ecosystem management across different sectors, while faced with a seemingly insurmountable deficit of ecological data, as well as, paradoxically, too much complexity.

Currently, different countries are at different stages of implementation. Many countries have at least, to varying degrees, adopted the principals of ecosystem-management into their general management culture, while some have identified and incorporated ecosystem-based indicators into management plans, yet very few have shown success in actual implementation at a fishery-wide level (Pitcher, et al., 2009). Some individual fisheries have had ecosystem-based management plans successfully implemented as a result of evolving co-management plans, however, regional-scale, multi-sector, 'whole governance' frameworks are perhaps a long way off with the exception of a select few countries; most notably Australia (Fletcher, 2009). A study by Pitcher, et al. (2009) analysed the success of implementation for 33 countries and found that, "no country rated overall as 'good', only four countries were 'adequate', while over half received 'fail' grades" (p. 223). In that study, Iceland, South Africa, Canada and Australia were rated as 'adequate', while just the USA and Norway showed 'good' performance (Pitcher, et al., 2009).

While there was a trend towards rich countries faring better than poor countries, there were exceptions, most notably the considerable progress of South Africa as opposed to the relatively poor progress of some developed European countries like France and the UK. Interestingly, some of these European countries performed poorly in spite of falling under progressive policy regimes like the reformed, ecosystem-focused, *Common Fisheries Policy* (Pitcher, et al., 2009). This may be a result of some nations "responding piecemeal to specific international agreements, advocacy pressure, trade requirements or immediate crisis" (Pitcher, et al., 2009, p. 231) as opposed to the development of

comprehensive ecosystem-based management plans (Bianchi, et al., 2008; Pitcher, et al., 2009).

6. Discussion, Further Arguments and Recommendations

6.1. 'Wikifisheries'

Of course, the scientists and economists who designed the mid-20th century models based on MSY and economic efficiency were using the best available data and methods for the time (Sanez-Arroyo & Roberts, 2008). These approaches led to a furthering of understanding about the population dynamics of individual fish stocks. However, the interface between management's use of these technical fixes and the real-time changes in marine ecosystems that resulted (from a combination of environmental change, overfishing and habitat destruction) is a classic example of a learning process that was far too slow for adaptive management to be effective (Harris, 1998; Tuchman, 1984). Considerable faith has arisen during a period of reorganization during the 1990s and 2000s in the ability of the ecosystem-based approach to solve this problem.

Unfortunately, for many countries the ecosystem-based approach to fisheries management still remains more in theory than in actual practice. This is in part due to the technical complexity involved. As mentioned above, one of the challenges to successful ecosystem-based management has been figuring out how to balance knowledge and precaution (CIEAF, 2006). Coming to grips with the problem of having to work with a

greater number of issues and indicators while at the same time realizing that there is an inevitable shortage of data to fully describe these issues and indicators has been the source of considerable frustration.

However, the focal point of this paper is on the additional societal issues that the ecosystem approach is coming to include, like for example, the use of social and cultural contexts as indicators for management plans. Such indicators are hard to quantify and may ultimately depend on value judgements about biodiversity that will be case-specific across numerous cases. As stakeholder participation increases so too does the influence that societal perceptions and values have in the governance process (Gray & Hatchard, 2008; Princen, 2010; Rifkin, 2009). It is here where an understanding of expanding empathy may play an important role.

According to Rifkin (2009) "a sea change in human values has taken place over the course of the past fifty years around the world" (p. 447). The classic utilitarian model of human nature, born out of the Enlightenment and based upon self-interest as the prime motivator became the principal lens through which policy has been designed. This model stifled our understanding of complexity and empathic extension. But, a new model of human nature, one based on collaboration is on the rise. Rifkin (2009) proposed that if there is an 'invisible hand', it is a maturing empathy and an expanding of consciousness outward to include all the relationships that the current communications and energy regimes allow for.

As discussed above, the coming of the ecosystem-based, biodiversity-centered perspective to fisheries has created a growing demand for the accommodation of a massive amount of complex information from diverse, cross-scale perspectives. It has also contributed to the reframing of fisheries management into an environmental conservation problem and thus raised the issue of marine stewardship into the global public sphere. The influx of new stakeholders has the potential to marginalize important actors, foster distrust and make management institutions too inflexible. Flexibility is needed to allow social learning and adaptive management to work, which may be the only way to keep up with an increasingly unpredictable resource environment (Rammel, et al., 2007). Nikolic (2010) has argued that what's needed to grow sustainable socio-technological systems are decentralized, 'bottom-up' forums of collaboration that incorporate a willingness for mistakes to be made in order for adaptive learning to happen.

As the decision-making venue shifts above an emerging image of resource extraction that values biodiversity over economics, policy change is no longer driven by centralized government institutions (Rifkin, 2009). Thus, policy making "...is not a case of groups begging government to let them in, but of government trying to make use of what exists in the group society" (Maloney, Jordan & McLuaghlin, 1994, p. 21). The paradoxical challenge now is that, with the democratization of information and communications comes the need to prioritize who gets heard. However, that level of control is becoming less of a possibility partly because of the new communications regime (Gibbs, 2008; Hernes & Mikalsen, 1999; Rheingold, 2002).

What is needed in order to make management systems more resilient is social resilience by means of institutional innovation that facilitates effective communication. This communication is possible via the translating of information across different scales from the various subsystems involved into a useful collaborative format. As Rammel et al. (2007) argued:

> Long enduring evolutionary networks must contain cooperative links that lead to an overall systemic performance that is adaptive and successful in its surrounding environment. Between micro-level interactions and macro-level adaptivity, sustainability arises, if each subsystem fits successfully in the network, and if the network successfully fits into the wider environment (p. 11).

The roots of this type of communication was theorized by Wilson (1998) as *Consilience*, described by Pinker (1998) as "literally a 'jumping together' of knowledge by the linking of facts and fact-based theory across disciplines to create a common groundwork of explanation" (Pinker, 1998, p. 7; Sanez-Arroyo & Roberts, 2008).

Strength in fisheries governance may depend increasingly on the 'weak ties' that link or 'bridge' dense clusters of social structure (ex. groups of people working to solve a specific fisheries problem) with other disparate dense clusters that would otherwise collaborate far too slowly (if at all) for effective adaptive/social learning to occur (Reed, et al. 2010; Granovetter, 1983). It is from this viewpoint (i.e. that adaptive learning can occur as a deliberation that goes beyond simple information exchange) that fisheries governance must seriously incorporate an understanding of network governance into its *Modus operandi* (Reed, et al 2010). In its simplest form, network governance refers to understanding how self-organizing social networks arise and function in response to

fisheries problems and "the increasing role and importance that institutions and individuals that are not harvest rights holders, or mandated centralized management agencies, now have in many fisheries" (Gibbs, 2007, p. 116).

The internet will inevitably prove to be the sextant that institutions will need to navigate the maelstrom of complexity demanded by the ecosystem/participatory paradigm. Garcia (2011) has argued that, for fisheries management, "the time has come to establish one or more communities of practice (*sensu Wenger*) and that the internet could be used efficiently for this purpose, enhancing the co-evolution of science and decision-making" (p. 1). Gibbs (2007) highlighted the potential of the internet for challenging top-down management structures and suggested that "...fisheries management decisions can be analysed and dissected amongst the global community online and more importantly, completely beyond any degree of control by a centralized management authority" (p. 117).

Network governance can potentially be used in implementing the ecosystem-based approach in two ways. Firstly, the *community of practice* could apply to regional ecosystem-based management frameworks to facilitate collaboration between sectors, agencies, science, etc... Secondly, a truly 'open Wiki' for marine ecosystems could serve as a forum of information exchange and collaboration that management agencies could utilize for assessing and incorporating societal ecosystem values into policy.

The realization of such virtual communities of practice on a global, national or regional level remains in the theoretical realm, in spite of the fact that the infrastructure required is

already in place (Garcia, 2011). Large science-based advisory networks like the International Council for the Exploration of the Sea (ICES) already exist, but truly 'free' collaborative formats that anyone can access and participate in have yet to emerge. However, it is not difficult to imagine a community of practice, 'WikiFisheries' let's say, where expertise and bridging software can be developed and pooled in an open, collaborative forum. Numerous examples of Web 2.0 networks are already popular, as second-generation "distributed computing" is "sweeping the global business community" (Rifkin, 2009, p. 527; Freidman, 2006; Hartley, 2010; Nikolic, 2010; Rheingold, 2005).

Hardin (1968) was quite adamant (and correct) that technical fixes really don't work because they require "a change only in the techniques of the natural sciences, demanding little or nothing in the way of change in human values or ideas of morality" (p. 1243), and technical fixes have been blamed for the mismanagement of fisheries around the world (Degnbol, et al., 2006). Therefore, the truly innovative approaches mentioned above (ex. adaptive management, network governance, online communities of practice) are mediums for collaboration and collective action as opposed to one-size-fits-all prescriptions. Deliberative initiatives (e.g. online 'communities of practice') could help lead fisheries governance from 'damage control' to adaptive co-evolution. The challenge for fisheries policy in the future will be to design the collaborative forums and cooperative links needed to facilitate a dialogue between differing stakeholder perspectives in order to benefit from social learning.

McLuhan's (1964) idea that 'the medium is the message' is by now overt to the point of cliché, but, it is clearly a central point in our discussion of empathy and the ecosystem-based approach. For example, over the past 20 years, according to Rammel, et al. (2007) "there has been a growing awareness that technology is co-evolving with its socio-economic and bio-physical environment. This emphasizes the interdependencies between technologies, institutions, values and the bio-physical environment" (p. 11). Varjopuro, et al. (2008) has argued that "implementation of ecosystem management requires a "seismic shift" in the mindset of humans" (p. 149). The mcluhanesque 'message' to consider is that the mediums of new communications technologies are changing how socialization is structured and the way perception happens by "predisposing us towards a systems thinking" (Rifkin, 2009, p. 600), thus making the ecosystem-based approach more and more plausible. Conversely, the ecosystem-based approach is also a theoretical medium with a message because, "ecology is networks... To understand ecosystems ultimately will be to understand networks" (Bernard Pattern as quoted in Rifkin, 2009, p. 599). Because of, *inter alia,* these network characteristics, it is the position of this paper that the ecosystem approach, in both theory and practice, can be explained as a manifestation of the expanding empathy described by Rifkin (2009).

It was actually not because of its private property argument that Hardin's (1968) *tragedy of the commons* theory was so important and enduring in the long-run. Instead, it is because it provided a starting point for popular discourse about the rapid societal transition into a resource-finite modern world and the appropriateness of the suitcase of

innate behaviours that natural selection has packed for us. The premise of Hardin's tragedy is compatible with Rees' (2008) contemporary view that:

> biophysical unsustainability is an inevitable "emergent property" of the interaction of techno-industrial society and the ecosphere with deep roots in fundamental human nature... the world community must acknowledge the true human nature of our collective dilemma and act to override innate behavioural predispositions that have become maladaptive in the modern era. (p. 685)

Rifkin (2009) might add that the world community must stop overriding our innate empathic predispositions, but would also agree with Rees (2008) that, like all other species, humans have the drive to expand their territory to its limits and exploit all available resources. Rifkin's (2009) thesis argues that empathic expansion has been and continues to be, directly tied to the exploitation and degradation of natural resources because of the techno/social advancements that such activities bring. However, as seen in the recent rise of the green agenda, human empathy is expanding at the societal level to include non-humans and the biosphere, thus introducing new valuations and demanding more meaningful approaches to human interactions with the planet. As collaborative forums become more sophisticated, empathy has the potential to drive collaboration over resource management in a more sustainable direction (e.g. renewable energy).

While Hardin (1968) may have simply reinforced the commons problem through offering up "prevailing conceptual frames and cultural norms" (Rees, 2008, p. 685) as the solution, he set in motion a fundamentally important (yet painfully slow evolving) discussion that became increasingly interdisciplinary and fruitful (for example, would Elinor Ostrom have won the 2009 Nobel Prize in economics without Hardin's *Tragedy*?).

The true solution to the commons dilemma, then, will prove to be the process that Hardin helped start, because, as Rheingold (2005) explained, "people are only prisoners if they consider themselves to be. They escape by creating institutions for collective action" (Rheingold, 2005).

Thus, collaboration is the key. Achieving cross-disciplinary cooperation that draws upon "perspectives, insight and methodologies of all disciplines as required for the specific case" (Degnbol, et al., 2006, p. 541) has been identified as a key challenge for successful fisheries governance. Recently, a large group of top fisheries researchers concluded that pragmatic management strategies are the most effective. When recovery plans do work, it is likely due to "a combination of traditional approaches (catch quotas, community management) coupled with strategically placed fishing closures, more selective fishing gear, ocean zoning, and economic initiatives..." (Worm & Hilborn, et al, 2009, p. 584). .... It is highly unlikely that such cooperation and integrated thinking are simply the results of individuals working with profit maximization as their prime motivation.

6.2. Empathy, Stewardship and the Ecosystem-based Approach

> *Empathy's chief portal is identification. We're ready to share the feelings of someone we identify with, which is why we do so easily with those who belong to our inner circle: For them the portal is always ajar. Outside this circle, things are optional. It depends on whether we can afford being affected, or whether we want to be.* –Frans De Waal (2009)

As mentioned above, the 'participatory paradox, described by Suarez de Vivero, et al. (2008), highlights the challenges that increasing stakeholder participation create. For example, in many cases, the worldwide trend of privatization via ITQs has led to forms of co-management that restrict stakeholder participation to current licence holders while the social concerns of fishing communities are largely ignored. Those privileged stakeholders who are included in decision-making spend considerable time fighting off the growing influence of a rapidly urbanizing public who seem more concerned about ecosystems and animal rights than the human beings directly dependent upon the sea (Schreiber, 2001; Suarez de Vivero, et al., 2008). Through the lens of the ecosystem-based approach, broadening stakeholder participation is shaping how society views property in the oceans and the commons as a concept is more and more so being returned to the public in unexpected ways. The question now will be what image or conception of stewardship will arise to drive fisheries policy in the years to come? (Gray & Hatchard, 2007; Princen, 2010)

The emergence of dramaturgical consciousness is making it completely acceptable for someone with absolutely no traditional connection at all in fisheries to express strong

lifestyle-based concerns about the industry. As Mikalsen & Jentoft (2001) put it, "any individual aspiring to a healthy diet, has a legitimate interest in the availability of quality seafood, which may be strongly affected by management practices" (p. 288).

As discussed above, seafood eco-labelling has become a key way that the fishing industry is promoting the sustainable-development conception of environmental stewardship. However superficial (Ward, 2003), the success of such initiatives is a useful example of how dramaturgical consciousness works at several levels. At its simplest, sustainable seafood consumption reaffirms ones identification with an ideological commitment to environmental justice. The purchasing of such products can be understood as a kind of psychosocial self-expression, or role playing, as property is transformed "into symbols that help people act out their many dramatic roles as they flit in and out of networks of lived experiences, each representing a different aspect of their life story" (Rifkin, 2009, p. 561).

Seafood eco-labelling might also be viewed as a step towards what Goleman (2009) called "radical transparency" (p. 243) (for example, MSC chain of custody certification aims to ensure the traceability of a seafood product from the time it was landed aboard a vessel to the point of final sale). The potential for this approach to provide more detailed ecological information to consumers is intriguing to consider... The truly cosmopolitan consumer, who accepts the sustainable-development conception, may take the consumptive practice of sustainable seafood as an ethical experience that involves a metaphysical connection with the marine environment based on the information

available. Here we see the evolution of the ocean as a 'theory machine' thanks to the interplay between the network thinking of the internet generation and ecological ('ecosystem-based') consciousness. The split-second feeling or image of fish and the ocean that a seafood shopper might experience when making a purchasing decision is no longer simply of fresh inanimate protein beneath a rolling horizon but rather a much richer and less linear web of life that may illicit a more emotional response.

Dramaturgical consciousness, along with an advancing cosmopolitan sensibility, is also very compatible with growing public concerns for animal welfare. From an empathic standpoint, Rifkin (2009) sees the sudden emergence of the modern animal rights movement since the 1970s as a revolutionary step towards biosphere consciousness. In fact, the notion of a gradual expansion of human empathy to wider and more diverse relationships and eventually into the non-human realm, as a trajectory of human progress, was first put forward by the famous animal-rights philosopher Peter Singer (1981). Animal rights can be seen as ground-breaking step beyond a purely utilitarian ethics towards empathic growth because its proponents invest their concern and care without any kind of expectation for direct payback (Pinker, 2011).

The animal rights position begins out of a concern for individual creatures instead of whole species or ecosystems. This difference has left the animal rights movement at odds with modern environmentalism which deals with entire species or whole ecosystems and tends to be somewhat less emotionally driven. According to Rifkin (2009):

> The divide between environmentalists and animal rights people is illustrative of the difference between an older ideological consciousness, with its emphasis on

> rationality, utility, and efficiency, and an emerging biosphere consciousness grounded in personal participation, emotional identification, and empathic extension. (p. 469).

Fifty years ago, according to Rifkin (2009), the very notion of animal rights would have seemed completely crazy to the general public. The fact that it still does for some, but not for others, is proof of the divisions that exist across a wide spectrum of cosmopolitan sensibilities. However, in recent years, there has been a slowly evolving overlap between the two camps with animal rights groups including habitat issues in some campaigns and environmental groups using individual 'flagship species' to drum up public concern and funds (Rifkin, 2009; Sergio, 2006).

Flagship species are charismatic species that become symbols, and rallying points to raise public environmental awareness. They may convey a brand image that is easily digested by the public for emotional connection (in contrast to complex ecological processes) (Home, 2009; Lorimer, 2007). Flagship species tend to be top-predator types (like bears, falcons, giant tunas, sharks, seals, etc...) that may act as umbrella species from which conservation efforts create a trickle-down effect that benefits the broader ecosystem (Sergio, et al., 2006). However, the intentional use of species that are appealing to humans may relate a vicious cycle by which conservation projects are prioritized on unscientific grounds, diverting a "disproportionate amount of funding to a few glamorous species without delivering broader biodiversity benefits" (Sergio, et al., 2006, p. 1049; Home; 2009; Lormier, 2007).

Fish have been especially short-changed in this regard. For example, Clark (2002) reviewed the entries of the leading conservation journals *Conservation Biology* and *Biological Conservation* over a 15 year period and found that fish species, along with invertebrates, were particularly underrepresented in comparison to mammals (Clark, 2002). This trend began to change somewhat in the early 2000s as a variety of large international conservation agreements and ENGOs began incorporating marine species, including fish, into their conservation efforts which had until then (outside of marine mammals) been exclusively terrestrially targeted. For example, the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES) saw a major spike in listings of aquatic species in that decade and the WWF began investing more heavily in campaigns against overfishing. However, the majority of the species involved were large, 'charismatic' species like sharks and Atlantic Bluefin tuna (Franckx, 2005; WWF, 2008).

Nonhuman charisma can be defined as "the distinguishing properties of a non-human entity or process that determines its perception by humans and its subsequent evaluation" (Lorimer, 2007, p. 915). These qualities are of vital importance to many ENGOs for motivating people to support their campaigns aimed at protecting biodiversity. Charismatic species have the potential to attract members of the public who might not otherwise have an ecocentric worldview. By publicising species with anthropomorphic features, campaigners are able to take advantage of human instincts like parental nurturing and empathy to create an emotional connection with their logo and cause (Gould, 1980; Lorimer, 2007, Rifkin, 2009).

Certain species are thus disproportionately bestowed with charisma because they fit within the narrow spectrum of human perception (olfactory, acoustic, and electromagnetic) and other (cultural) biases (Lorimer, 2007). Antarctic Krill, for example, because of their perceived size, inactivity and high numbers are, according to Leane & Nicol (2011), "treated as more of a physical background than a living creature" (p. 135), which is disconcerting given their central role in the ecosystem (Leane & Nicol, 2011). Indeed, while catching and killing fish in nets has not been an issue, capturing and understanding animals as they are actually living (through the lens of science and culture) has always been a challenge (Lorimer, 2010). Subsequently, the best descriptions of what fish are like alive and *in situ* have historically been coloured by mystery (ex. see Pablo Neruda's *Ode to a Large Tuna in the Market*).

With the exception of *Finding Nemo* (Walters & Stanton, 2003), animated films rarely include fish as protagonist, though heavily anthropomorphized animals are used frequently in the genre. These films primarily focus on evoking sentimental, emotional responses and have been criticized for 'Disneyfying' and grossly misrepresenting the harsh realities, while ignoring the true beauty, of nature (Lorimer, 2010; Rifkin, 2009; Tidwell, 2009).

However, such films can have considerable "micropolitical power" (Lorimer, 2010, p. 327) as sentimentality can translate into emotional bonds that help shape political views on issues connected to the conservation of charismatic species later in life. The environmental message has become more prevalent in this genre throughout the 2000s

and included the hit animated film *Happy Feet* (Miller, 2006) in which "emperor penguins score a total moratorium on Antarctic fishing thanks to their winsome tap-dancing routines" (McGoldrick & Marris, 2006).

Other forms of 'affective logics', besides sentimentality, through which film may mediate human-to-nonhuman understanding include 'curiosity and awe' (ex. Disney and the BBCs Oceans nature film and TV series), and 'sympathy and shock' (ex. PETA TV). However, each of these approaches have been heavily criticized for misrepresenting ecological realities (Lorimer, 2010).

Clearly, moving imagery has the potential to allow for parasocial relationships to occur between humans and animals, but because of perceptual and cultural biases, these encounters are much more complicated and difficult to mediate. These biases, which are "technologically enabled, but still corporeally constrained" (Lorimer, 2007, p. 916), present a deep-seated barrier to empathic extension and cut to the core of our philosophical discussion. However, the central tenant of *The Empathic Civilization* is that empathy will find a way to expand to include all the relationships that current communications technologies allow for. As moving imagery technology advances, so will the parameters of nonhuman charisma. For example, experimental 'disconcertion' approaches to filming nonhumans aim to "unsettle, educate and provoke curiosity by revealing unsentimental, absurd, violent and erotic universals that cut across species and space" (Knox... as quoted in Lorimer, 2010, p. 250). By interrupting the ingrained

anthropocentric assumptions of the viewer, these films may lead to new and unexpected ways of understanding nonhumans (Lorimer, 2010).

It seems that the success of empathic expansion into the oceans will depend largely on the ways that communications technology and techniques develop. While still in its infancy, the electronic tagging of large pelagic and other species is a fascinating example of what's to come. The tags collect *in situ* environmental and positioning data which can be mapped and represented in near-real-time, ocean-scale GIS imagery. Some examples include the Tagging of Pacific Predators Project (TOPP) and Stanford Universities Tag-A-Giant program that fitted dozens of pelagic predators, including a variety of shark species, tunas, seabirds and Leatherback turtles with tags containing microprocessors. Other popular examples include: the oceans touring feature on Google Earth that allows the viewer to follow the path of a Whale Shark, National Geographic 'critter-cams', strapped onto penguins for an underwater birds-eye view, and *The Great Turtle Race* in which millions of kids pick their favourite Leatherback turtle online (for example, see Block, 2010). In light of these developments, it is not hard to imagine these technologies advancing into a kind of 'Facebook for fish' mediated by technology and ecologists.

Even exposure to animated films that feature anthropomorphized fish as leading characters (i.e. *Nemo*) can increase the likelihood of young viewers volunteering at aquariums and may influence political views later in life (Lorimer, 2010; Tidwell, 2009). Such media allow people, particularly children, to develop new parasocial relationships with nonhuman creatures. As these experiences occur more and more on an individual

level, growing empathy will follow because "people need to individualize nonhumans before they can come to care for them" (Milton, 2002... as cited in Lorimer, 2007, p. 919).

The 'sustainable development conception' of fisheries stewardship which includes fishers and consumers as part of the ecosystem may be challenged in the future as more ecocentric ('nature-conservation') perspectives develop. However, the best place for industry to look for allies (which it is increasingly doing) is within the mainstream environmental movement and ocean-focused ENGOs (Gray & Hatchard, 2007). A census of popular literature and other 'pop-culture' media from the fisheries environmental movement today will reveal an array of pragmatic, factual and sophisticated arguments that fall squarely within the sustainable development conception.

For example, celebrity environmentalist, Ted Danson's recent book *Oceana* (written in support of the ENGO of the same name), is targeted directly at industrial overfishing (Danson & D'Orso, 2011). The book is sparse on emotional ploys and instead takes a journalistic exposé approach, full of easily-digested statistics and descriptions of fisheries policy issues and ecological concepts. The recurring protagonist in the book is University of British Columbia biology professor, Daniel Pauly, from whom Danson & D'Orso (2011) borrows phrases like "the industrial fishing complex" and, "there will be lots of jellyfish soup" (p. 121). The book calls attention to the plight of millions of small-scale artisanal fisheries, particularly off West Africa, whose livelihoods are jeopardized by large foreign industrial bottom trawlers. The empathic focus presented here is

primarily for the whole fisheries system, including the ecosystem, the fishers, as well as individual creatures (Danson & D'Orso 2011).

Another good example of this journalistic-type approach to advocating for sustainable development is the documentary *The End of the Line* (Hird & Murray, 2009; Hall, Dugan, Allison, & Andrew, 2010). This film, which also features Pauly, as well as other well-known fisheries researchers like Ray Hilborn and Boris Worm, provides a vivid and harsh depiction of industrial fishing. Similarly to Danson & D'Orso (2011), *The End of the Line* includes the seafood industry, as part of the solution to marine environmental problems. The *End of the Line*, for example, features MSC certification as a potential solution to overfishing. Both examples also use the charismatic Atlantic Bluefin tuna as a prime example of industry greed and ecological injustice.

Nevertheless, is clear that the negative image of the industry in the media has continued to escalate since the 1990s. The controversy created in the media over Worm et al.'s (2006) article in *Science* is a good example of this trend. The articled highlighted the importance of biodiversity to ecosystems and the negative effects that biodiversity loss has on ecosystem resilience (Worm et al., 2006). The abstract to the article reads as follows:

> Human-dominated marine ecosystems are experiencing accelerating loss of populations and species, with largely unknown consequences. We analyzed local experiments, long-term regional time series, and global fisheries data to test how biodiversity loss affects marine ecosystem services across temporal and spatial scales. Overall, rates of resource collapse increased and recovery potential, stability, and water quality decreased exponentially with declining diversity. Restoration of biodiversity, in contrast, increased productivity fourfold and

> decreased variability by 21%, on average. We conclude that marine biodiversity loss is increasingly impairing the ocean's capacity to provide food, maintain water quality, and recover from perturbations. Yet available data suggest that at this point, these trends are still reversible. (Worm, et al., 2006, p. 787).

However, a huge amount of media coverage was given to a brief point at the end of the article that used existing statistics to extrapolate the potential for mass fisheries collapse by mid century (Stokstad, 2009; Worm, et al., 2006). The article was widely depicted by the media as a doomsday prediction that helped paint the fishing industry, as a whole, as highly unethical.

Worm and colleagues were harshly criticised by many industry professionals and fisheries scientists for the negative press, and the article sparked a bitter debate (Stokstad, 2009). Stokstad (2009) argued that the conflict was reflective of a division in fisheries management between fisheries ecology and fisheries science (i.e. the traditional single-species perspective clashed with the newer ecosystem approach while the media misrepresented both). In Worm & Hilborn, et al. (2009) a large group of researchers from both camps came together to collaborate on a revised assessment of the state of the world's fisheries. The article concluded that:

> Combined fisheries and conservation objectives can be achieved by merging diverse management actions, including catch restrictions, gear modification, and closed areas, depending on local context. Impacts of international fleets and the lack of alternatives to fishing complicate prospects for rebuilding fisheries in many poorer regions, highlighting the need for a global perspective on rebuilding marine resources (Worm & Hilborn, et al., 2010, p. 578).

This group effort, as well as the pragmatic conclusions it produced, highlighted the importance of collaboration between differing perspectives within the sustainable-development conception. This collaboration can bring together the critical forward-thinking of the idealistic perception of ecosystem management with the pragmatic perception that is focused on achieving practical, real-world results. The great hope for the ecosystem-based approach is that it will, through the application of adaptive management, finally bring policy, science and society more closely in sync so that the management system doesn't fall back into the same old pitfalls of rigidity and 'tunnel vision'.

There are many signs that the initial inertia in implementing the ecosystem-based approach, created by the need to balance knowledge with precaution, was a short-term dilemma. The solution was well known and perhaps best described in the *Precautionary Principal* that states that "in order to protect the environment, the precautionary approach shall be widely applied by states according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall be not used as a reason for postponing cost-effective measures to prevent environmental degradation" (Rio Declaration, 1992, *Principal 15).* In other words -learn to work with what is available and move on with a pragmatic approach.

The Bergen Conference on Implementing the Ecosystem Approach to Fisheries (2006) highlighted the need to start with present knowledge and to apply greater precaution when there is greater uncertainty. According to Fletcher (2008), the most common issues

identified in an analysis of the decade-long process of applying the ecosystem-based approach to Australian fisheries were not deficits of scientific data but rather issues related to governance.

Australia has in fact forged ahead with implementation by creating a management framework that uses a risk-based approach to prioritize ecosystem-based issues in order to best direct management resources. The risk-based methodology avoids complex modeling and is easy-to-use. Complexity is further reduced through a risk consolidation procedure.

Australia started out by applying ecosystem-based management to individual fisheries and now is in the process of implementing region wide frameworks that include multiple fisheries and other sectors (Bianchi, et al., 2008; CIEAF, 2006; Fletcher, et al., 2010; Pitcher, et al., 2009). Given such examples and the increasing potential for collaboration as discussed in this paper (for example, network governance and online communities of practice), there is little doubt that the ecosystem-based approach will make considerable progress over the next decade.

Including some emerging ecological valuations into management plans will be very challenging (and interesting) in the years to come. For example, at the extreme opposite side of the spectrum is the animal rights movement's take on stewardship. At first glance, there seems considerably less opportunity for the industry to adapt to these new stakeholder concerns. According to PETA's website, for example, "whether the fish are

raised on aquafarms, caught in the ocean by giant nets or long-lines, or hooked at the end of a fishing line, eating them supports cruelty to animals" (PETA, 2011).

The assumption that fishing is cruel is reflective of a "feelings-based approach" (Arlinghaus, et al., 2007) to fish welfare that is part of the animal liberation and animal rights perspectives that accepts that fish suffer and feel pain in an appreciable way and should therefore, on moral grounds, be protected (Arlinghaus, et al., 2007; Huntingford, 2006). The alternative to 'feelings-based' approaches, according to Arlinghaus, et al. (2007), is a 'function-based' approach that values the health and physical wellbeing of fish in the environment. This perspective of animal/fish welfare is very compatible with an ecosystem-based, sustainable-development conception of fishing that focuses on the healthy functioning of ecosystems.

Here we see the nature-conservation conception of stewardship partly absorbed by the sustainable-development conception. This convergence has been an emerging pattern throughout this paper. However, in light of Rifkin's (2009) thesis of empathic progress, it is premature to concur with Gray & Hatchard's (2007) conclusion that "sustainable development is the primary or sovereign conception of environmental stewardship, whereas nature conservation is the secondary or satellite conception" (p. 791).

The ecologization of the modern environmental movement has accelerated since the 1990s as the notion of a holistic 'biosphere', popularized by Lovelock's (1979) *Gaia hypothesis*, has become more and more integrated into popular discourse. From this perspective, ecosystems as concepts take on characteristics of individual entities or

superorganisms. In this light, the ecosystem-based approach is compatible with the drive towards extended socialization *as well as* individual empathy and (if understood from a function-based or systems perspective) is also compatible with the nature-conservation-conception as well as sustainable development.

In the ecosystem-based approach, "the stakeholders themselves may be interpreted as parts of the ecosystem" (Gray & Hatchard, 2008). This perspective can be viewed as the self-actualization of human stakeholders within the fisheries system. According to Rifkin (2009), an increased sense of 'self-hood' within a system is the prerequisite vehicle through which empathic experience can be realized, thus helping people "to find meaning in belonging to ever richer and deeper realms of reality" (p. 39). This realization of being dependent on a power of something beyond human control, be it nature or a deity, is a common experience across all cultures and, according to Collet (2002), this realization creates a "regulatory function in religion and belief..." (p. 542).

The discussion here, has exposed a central philosophical dilemma as human empathy is understood to be constrained by our innate (perceptual) and cultural (e.g. narcissism and nihilism vs. connection and inquiry) biases. If, as Rifkin (2009) suggested, the level of interaction with ones social and physical environment determines how knowledge and empathy develops, then the ecosystem-based approach can be understood as a unifying solution to the anthropocentric/ecocentric dichotomy that has divided modern environmentalism for over a century. It removes arbitrary boundaries between the social

and the ecological and allows for increasing intellectual and emotional connections on both individual and network levels.

7. Conclusion

By using Rifkin's (2009) thesis, this paper attempts to introduce the increasingly popular idea of empathic progress as a conceptual framework to better understand fisheries stewardship. Over the past two decades the world of industrial fishing has undergone a period of creative reorganization resulting in an influx of stakeholder values. Traditional 20th century approaches, narrowly defined in terms of utility and efficiency, have given way to a more holistic perspective.

Rifkin's (2009) thesis argued that empathic expansion has been directly tied to the exploitation and degradation of natural resources because of the techno/social advancements that such activities bring. However, as seen in the recent rise of the 'green agenda', human empathy is expanding at the societal level to include non-humans and the biosphere, thus introducing new valuations and demanding more meaningful approaches to human interactions with the planet. As collaborative forums become more sophisticated, empathy has the potential to drive collaboration over resource management in a more sustainable direction.

This paper has identified some of the philosophical divisions that exist around the modern idea of fisheries stewardship (i.e. enlightened vs. communal, sustainable

development vs. nature-conservation, idealistic vs. pragmatic). However, these divisions are less important than first thought. This paper has argued that, within the 'theory machine' of the oceans, the rise of the green agenda and ecosystem-based thinking is bringing about a far-reaching societal consensus that is best described as a cultural process.

It is the position of this paper that stewardship would be better understood if redefined through an empathic model of human nature that understands both the drive for extended socialization into broader networks of relationships and meaning as well as the underlying empathic drive for individual connection. The ecosystem-based approach, in both theory and practice, can indeed be explained as a manifestation of biosphere consciousness and expanding empathy as described by Rifkin (2009).

It is unclear if the ecosystem-based approach/stakeholder participation relationship will evolve quickly enough to foster the resilience that is needed for fisheries systems to withstand the pressures from overexploitation, habitat destruction and climate change. Whatever shape this cultural process takes in the future, empathy will be the glue that holds that relationship together because it is the true driver of stakeholder participation. As Rifkin (2009) explained, "empathy becomes the thread that weaves an increasingly differentiated and individualized population into an integrated social tapestry, allowing the social organization to function as a whole" (p. 37).

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