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Nemo's Plight: Political Economy, Green-Cultural Criminology, and Fish Abuse

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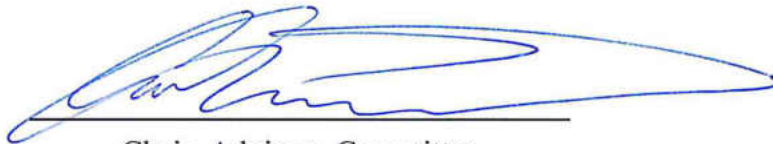
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NEMO'S PLIGHT: POLITICAL ECONOMY, GREEN-CULTURAL CRIMINOLOGY,
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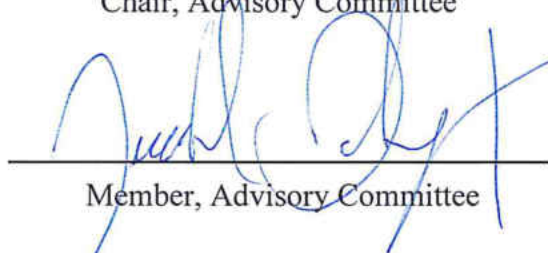
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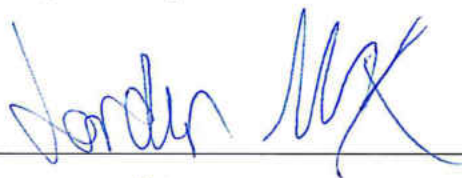


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NEMO'S PLIGHT: POLITICAL ECONOMY, GREEN-CULTURAL CRIMINOLOGY,
AND FISH ABUSE

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Submitted to the Faculty of the Graduate School of
Eastern Kentucky University
in partial fulfillment of the requirements
for the degree of
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DEDICATION

This thesis is dedicated to the abolition of capitalism.

ACKNOWLEDGMENTS

First off I would like to thank Dr. Avi Brisman for his undeserved patience with my seemingly inexhaustible powers of procrastination. But more importantly I would like to thank Avi for providing me with the means to academically intertwine my passions for the environment and social justice through green criminology. I would like to thank Dr. Judah Schept for providing guidance and critique on that tenuous tight-rope one must walk between activist and scholar. I would like to thank Dr. Kishonna Gray for keeping me grounded in the work that matters, and providing me emotional support throughout this journey more than anyone else. I would like to thank all those activists and organizers throughout Kentucky and Appalachia who have shown me what it means to fight the good fight. And I would like to thank my family and friends who have received far too few calls and check-ups throughout this process but who are also the only reason I have made it this far. I love and appreciate you deeply.

ABSTRACT

Using the Marine Aquarium Fish Trade as a case study, I propose an integrated theoretical framework in green criminology that strengthens the political economic "treadmill of production" theory (see Lynch et al., 2013) by incorporating an analysis of the "cultural grease" that ensures the treadmill's smooth operation. Choosing fish as a subject matter, though, requires challenging the "thoroughgoing speciesism" (Beirne, 1999) inherent in the mammalian-centric animal abuse literature. To do this I draw from research in marine biology and animal cognition to philosophically establish that fish are moral agents, "subjects-of-a-life" (Regan, 1983) on par with mammals and thus worthy of more in-depth consideration within the animal abuse literature. I move from this philosophical argument to laying out my integrated treadmill of production/green-cultural criminological model. Starting with the cultural grease that keeps the treadmill turning, I outline the ideological work of the Association of Zoos and Aquariums and how, through its public aquariums and organizational behavior, it and its member aquariums facilitate cultural narratives and silences conducive to anthropocentric capitalism and the trade in marine fish. Then I look at the destruction wrought by the treadmill itself, outlining the specific instances and macro-patterns of environmental destruction these narratives facilitate along the entire treadmill of production: from the widespread destruction of coral reef habitats in Southeast Asia, to harm induced by transportation, to global warming. Resulting, ultimately, in mass marine-theriocide.

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CHAPTER I

INTRODUCTION

"Yes, I love it! The sea is everything! ... On the surface, they can still exercise their iniquitous laws, fight, devour each other, and indulge in all their earthly horrors. But thirty feet below its surface their power ceases, their influence fades, and their dominion vanishes! Ah, monsieur, to live in the bosom of the sea! Only there can independence be found! There I recognize no master! There I am free!"

- Captain Nemo (Verne, 1962: 73-4)

A century-and-a-half of anthropocentric capitalist expansion later, one can only wonder with what horror the avowed anti-imperialist, expert marine biologist, and intrepid Captain of the *Nautilus* might look upon the state of his beloved ocean. Evidence of human domination of the surface and depths of Earth's oceans is pronounced and profound: from rising ocean acidification and temperature due to anthropogenic global warming to rampant overfishing and species collapse to the spreading of oxygen-deprived "dead zones" to the accumulation of hundreds of millions of tons of plastic and other debris in vast gyres (and marine life) to the rapidly increasing destruction of coral reefs and corresponding decline of ocean biodiversity. While Captain Nemo would no doubt be troubled by the state of the world's oceans, he might find little solace in the non-speciesist criminological literature of animal abuse. Indeed, he might well ask, "What about the fish?" This thesis takes steps towards addressing this question by focusing on the practice and conditions of keeping aquatic species—specifically, fish—in captivity.

Its main argument is that such patterns constitute *animal abuse*—a classification of harm that heretofore has been applied almost exclusively to terrestrial animals.

This thesis begins by situating the philosophical nature and corresponding treatment of fish within Singer's (1990) utilitarianism and Regan's (1983) intrinsic "subjects-of-a-life" animal rights framework, and in turn seeks to explain why the plight of fish should be included in the animal abuse literature. By incorporating research in the fields of marine biology and animal cognition into the debate around the extension of moral consideration to fish, this thesis contends that not only do fish meet the utilitarian threshold of having a capacity to suffer, but they are complex and intelligent social creatures, on par with mammals, that fall squarely within Regan's (1983) understanding of "subjects-of-a-life." Next, this thesis develops an intertwined "treadmill of production" political-economic and green-cultural criminological framework with which to interrogate what many consider to be positive responses to the abuse of fish and broader environmental destruction. That is, I interrogate public aquariums, through their utilitarian discourses of "conservation" and "animal welfare", as sites of important capitalist ideological work that serve to maintain dominant anthropocentric conceptions of marine life and culturally facilitate continued animal abuse and environmental destruction. This thesis's final section uses this "treadmill of production"/green-cultural criminological framework to further explain the nature of potential abuse faced by individual fish held captive in the U.S. marine aquarium fish trade. And lastly this framework is used to explain the scope and macro-scale prevalence of abuse, theriocide,

and destruction of coral reef habitat necessary to maintain the U.S. marine aquarium fish trade at the start of the "treadmill" in Southeast Asia.

CHAPTER II

FISH AS SUFFERERS AND "SUBJECTS-OF-A-LIFE"

Within the broader green criminological literature, fish are treated anthropocentrically—as resources ("fisheries") for human consumption (see, e.g., Croall, 2007: 211-212; Hauck, 2007; Hauck and Sweijd, 1999; McMullan and Perrier, 2002; Tailby and Gant, 2002). Within the green criminological literature that focuses on animal abuse from a non-speciesist perspective, fish are mentioned in passing, if mentioned at all, with a great deal more focus placed on their mammalian or avian counterparts. These mammals and birds are implicitly or explicitly deemed to be of superior sentience to fish; that is beings with complex mental lives marked by feelings, self-consciousness, memory, intention and the like. Arguably, the reason for such a slanted focus on mammals and birds may arguably be a "thoroughgoing speciesist" (Beirne, 1999) prejudice against fish inherent in the anthropocentric biases of Singer's (1975) utilitarianism and Regan's (1983) "subjects-of-a-life" animal rights frameworks so integral to the early non-speciesist works of Beirne (1999), Benton (1998), Cazaux (1999) and others. That is, whether fish are capable of experiencing pain or suffering, much less sentience—basic prerequisites in Singer's and Regan's moral frameworks—has long been the subject of debate. Let us first turn to Singer's utilitarianism.

Building off Bentham's eighteenth-century application of utilitarianism to animals—"The question is not, Can they reason? Nor Can they talk?, but, Can they suffer?" (Bentham, 2005: 283)—Singer (1975) argues against various forms of anthropocentric speciesism that cause unnecessary suffering to other sentient creatures

capable of feeling pain or pleasure (see Beirne, 1999 for an overview). In order to act morally in Singer's utilitarian framework, humans are obligated to give equal consideration to all beings capable of suffering. This consideration is not an extension of *rights* to the individual being (see Brisman, 2014 for a discussion), but a *moral calculus*—one which holds that if a nonhuman animal species can *suffer*, he/she (see Sollund, 2015 on the use of "he/she" rather than "it" to move away from speciesist language) is worthy of such consideration that will lessen that suffering (although balanced in regards to the benefits that may be derived from said suffering for the typically anthropocentric, followed by species, majority). This focus on suffering in the utilitarian framework can be understood as a fundamental stumbling block in the extension of moral consideration to fish. It has long been assumed—in both marine biology literature and popular culture—that fish possess neither the necessary nerve pathways nor brain structures capable of turning external stimuli that may damage their physical being into pain, a perspective perhaps most vehemently defended by Rose (2002; see also Rose et al., 2014). In turn, this inability to feel pain and to suffer physically has been used as a basis to assert that fish also lack the capacity for intelligence and sentience (Rose et al., 2014). Without the establishment of such capacity for suffering and in turn sentience within fish, there is certainly little argument to be made that a utilitarian framework applies to them, rendering them little more than Cartesian automaton.

Regan (1983) argues that humans and nonhuman animals contain intrinsic value (instead of having value ascribed to them, such as in Singer's utilitarian framework) if they are "subjects-of-a-life":

Individuals are subjects-of-a-life if they have beliefs and desires, perceptions, memory and a sense of the future, including their own future; an emotional life together with feelings of pleasure and pain; preference- and welfare-interests; the ability to initiate action in pursuit of their desires and goals; a psychophysical identity over time; and an individual welfare in the sense that their experiential life fares well or ill for them (Regan, 1983: 243).

Such "subjects-of-a-life" are "moral agents" who have the capacity to be held accountable for their own behavior and a duty to uphold the intrinsic rights of other "subjects-of-a-life," namely "moral patients" (Beirne, 1999). "Moral patients" differ from "moral agents" in that the former cannot be held morally accountable for their behavior because they are unable to control said behavior. Nevertheless, "they have inherent value and one is required to respect them no less than one respects moral agents. To respect a moral patient means not only to revere her life but also to defend her from harm" (Beirne, 1999: 133-134). In his critique of the extension of a rights framework to non-human animals, Benton (1998) seeks to problematize Regan's (1983) concept of a "subject-of-a-life" by deploying fish as an illustrative example of the "species boundary" of "moral patients," echoing other critiques of Regan's moral framework for being mammalian-centric and thus "super-speciesist" (Kappeler, 1995). As Benton (1998:161) argues, "It may be open to dispute whether... fish are subjects of a life in the relevant respects, but this can be

addressed by a generous application of the necessary criteria, just in case they are."

Benton reasons that one means by which to overcome the arbitrary cut-off line between those nonhuman entities considered "subjects-of-a-life" and those who are not could be to simply "extend the moral purchase of rights and justice beyond psychologically complex mammalian relatives to include other forms of animal and plant life and even non-living beings" (1998:161). As Benton notes, though, the danger with this approach is dissolution of the very criteria of the application of rights in the first place.

Given this thesis's focus on fish, I will adopt the alternative strategy of keeping in place the requisite criteria that Regan has laid out as qualifying animals as "subjects-of-a-life." I will endeavor to demonstrate how research in the biological sciences has shown fish to meet said criteria.

In order to establish the capacity of fish to suffer—and thus satisfy Singer's utilitarian moral framework—we must first address Rose and colleagues' (2014: 104; see also Rose 2002) core argument which centers around the lack of a human-like neocortex in fish: "[t]he conscious experience of pain most likely requires highly developed and regionally specialized forebrain neocortex (and associated limbic cortex), which fishes do not have." Brown (2014: 123) argues that Rose's (2002; Rose et al., 2014) "central argument is both anthropocentric and anthropomorphic" in that "this argument is contingent on Rose's erroneous belief that the neocortex is the centre of consciousness in humans and that fish lack any comparable structure." Brown (2014:123) then undermines Rose's (2002) argument by pointing to recent research that indicates that there is little reason to suspect the human neocortex is involved in consciousness and research showing

that fish "effectively have analogous [brain] structures and functions to other vertebrates." In addition, there is a host of experimental research indicating the capacity of fish to respond to physical stimuli with behaviors indicative of experiencing pain (Braithwaite, 2010; Braithwaite and Huntingford, 2004; Chandroo et al., 2004a, 2004b; Sneddon, 2003; Sneddon et al., 2003a; Sneddon et al., 2003b)¹. While it cannot be said definitively whether fish are capable of experiencing physical pain as suffering, the preponderance of the evidence laid out in the above studies lend credence to the argument that they can—at least, insofar as, any other nonhuman animal can. Even if we were to concede, however, that fish are incapable of suffering from physical pain, this would still not completely disqualify them from moral consideration under a utilitarian framework or "subjects-of-a-life" moral framework. If we were to reduce these frameworks to the capacity for physical suffering, after all, that would automatically disqualify those humans inflicted with congenital analgesia or congenital insensitivity to pain with anhidrosis (CIPA) (also called hereditary sensory and autonomic neuropathy type IV)—conditions that render individuals unable to feel physical pain.

But what of fish as "subjects-of-a-life" or as "moral patients"? As Beirne (1999: 134) says of Regan's (1983) criteria for claims for "subjects-of-a-life": "among the leading attributes of the mental life of many animals, especially normal mammals aged one or more, are perception, memory, desire, belief, self-consciousness, intention,

¹ It should be noted that such experimentation conducted to determine the pain capacity of fish are forms of animal abuse in and of themselves. The experimenters utilize a utilitarian scientific rationale that justifies the harming of a few fish to primarily advance the body of scientific knowledge, and in some cases with a secondary objective of showing that fish should fall under our current rights frameworks due to their capacity to suffer (see Bekoff, 2007 for discussion).

and a sense of the future." Bekoff (2007: 89), also bypassing the problematic utilitarian stumbling block of suffering, states in regards to fish that "intelligence and suffering are not necessarily correlated and clever animals do not suffer more than less clever individuals." Establishing such intelligence, such sentience, is an issue that Brown (2014: 123) takes head on, compiling a comprehensive literature review of the relevant marine biology and animal cognition research that shows:

Fish have very good memories, live in complex social communities where they keep track of individuals and can learn from one another; a process that leads to the development of stable cultural traditions. They recognize themselves and others. They cooperate with one another and show signs of Machiavellian intelligence such as cooperation and reconciliation. They build complex structures, are capable of tool use and use the same methods for keeping track of quantities as [humans] do. For the most part, their primary senses are just as good, and in many cases better, than our own. When comparing their behavior to primates, one finds very few differences... One must conclude, therefore, that the level of cognitive complexity displayed by fishes is on a par with most other vertebrates, and that if any animals are sentient then one must conclude that fish are too.

In other words, Brown's (2014) systematic approach establishes that fish fall squarely within Regan's (1983) conceptualization of "subjects-of-a-life" and thus qualify as moral patients deserving protection due to their intrinsic value. Additionally, Kappeler's (1995) argument that Regan's "subjects-of-a-life" framework is "super-speciesist" is partially undercut by Brown's (2014) findings that serve to greatly expand the range of species the

framework covers beyond solely mammals. Having firmly situated fish within the two rationalistic moral pillars at the base of the nonspeciesist animal abuse literature, we can now interrogate how the discourse of utilitarianism as expressed through calls for "conservation" and "animal welfare" by zoos and aquariums serves to actually perpetuate conditions conducive to animal abuse.

CHAPTER III

THE IDEOLOGICAL WORK OF PUBLIC AQUARIUMS AND ZOOS

As a theoretical tool, Lynch and colleagues' (2013) use of the political economic concept of the "treadmill of production" to illuminate the capitalistic crime of ecological disorganization has significant bearing on the expansion of the animal abuse literature. The "treadmill of production" focuses on capitalism's imperative to expand and transform ever wider swaths of nature from, as White (2002: 85) puts it, "previously unproductive or noncapitalist forms of activity into sites of productive labor." Importantly, the "treadmill of production" also incorporates an understanding of ecological additions (pollutants) and withdrawals ("raw material input into the treadmill and the forms of ecological damage created in accessing those materials" (Lynch et al., 2013: 1003)) that contribute further to ecological disorganization and destruction. Such a framework is powerful in making theoretical sense of individual instances and wider processes of environmental destruction; its mechanistic metaphor, however, is lacking an explanation of the lubricating grease that keeps the gears of the treadmill turning. A more holistic theoretical framework is one that incorporates an understanding of how the consumption of nature is culturally constructed, and how ideological narratives perpetuate such consumption. This incorporation of "cultural grease" into the "treadmill of production" framework furthers Brisman and South's (2014: 6; see also Brisman and South, 2012; Brisman et al., 2014) argument for an overlapping green-cultural criminology in which "green criminology must attend to... the commodification and

marketing of nature and the construction of the insatiable consumption that underpins this."

Having established the political economic treadmill and its cultural grease, we are thus primed for a green criminology capable of theoretically situating "the sources of animal abuse" not only in individual acts "but also in various institutionalised social practices where animal abuse is seen as socially acceptable" (Beirne, 2007: 55). Such an articulation of animal abuse establishes a base from which we may critique the various sites of ideological work that undergird such socially acceptable practices in which "denial is ingrained in the hegemonic dominance of anthropocentric, and specifically capitalist, conceptions of the relationship between human beings and nature" (White, 2002: 83). Having established the moral standing of fish, whether utilitarian or intrinsic, I will now interrogate one of the predominant sites of such anthropocentric ideological work that influences our collective relation to marine life in general and fish in particular: the public aquarium.

The non-profit Association of Zoos & Aquariums (AZA), established in 1924, remains the predominant accreditation agency in the United States with 230 members zoos and aquariums and over 181 million annual visitors. Organizationally, the AZA is "committed to being a global leader in promoting species conservation and animal welfare by leveraging the size, scope, expertise, and public trust of its member institutions" (AZA, 2015: 1). While this may sound innocuous—and perhaps even *noble*—the terms "species conservation" and "animal welfare" reveal problematic orientations to fish and other animals.

In making a distinction between those working from an "animal rights" perspective and those focusing on "animal welfare," Bekoff (2007) identifies "animal rights" as consistent with Regan's "subjects-of-a life" framework; the "animal welfare" perspective, adopted by zoos and aquariums, views animals in primarily utilitarian terms. Thus, "animal welfarists," according to Bekoff (2007: 89), "believe that while humans should not abuse or exploit animals, as long as we make the animals' lives comfortable, physically and psychologically, we are taking care of them and respecting their welfare" and that "it is permissible to use animals if the relationship between the costs to the animals and the benefits to the humans is such that the costs are less than the benefits." Such a utilitarian rationale represents the philosophical justifications of modern zoos and aquariums, as evidenced by the discourses of "species conservation" and "animal welfare" (too be read: cultural grease) running throughout the AZA's publications and website. Operating from a "subjects-of-a-life" framework, on the other hand, would necessarily preclude the caging of complex social creatures, such as fish or other sentient animals, even if their basic biological needs were met, because:

To place animals with such [social] desires in situations in which these desires cannot be fulfilled—as is done by caging wolves in, say, roadside zoos—is to cause them *prima facie* harm, whether they suffer or not, because it is to deny them the opportunity to satisfy their desires for companionship or physical freedom of movement (Regan, 1983: 98).

With Regan's perspective in mind, we can see that while on the surface AZA "species conservation" and "animal welfarism" discourses support a potential ecocentric view of

nature and the animals within it (see Halsey and White, 1998; White, 2013), a closer read of the activities of the AZA-member institutions points to the anthropocentric ideological work at play.

In 2014, an AZA-estimated 81.9 million people participated in some form of their member's "conservation education" programs, however, the "5 most frequently reported conservation actions" advocated to participants were to: "Learn about the issue and teach others/Encourage collective action; Make informed purchasing decisions/Be a conscious consumer; Support conservation efforts and organizations; Create safe environments for wildlife; [and] Reduce/Reuse/Recycle [efforts]" (AZA, 2014: 6). It is arguable whether certain forms of collective action are conducive to the generation of positive environmental effects. More important, for the purposes of this thesis, is that the primary focus on "conservation" through pathways of "action" that involve individualistic changes in consumption habits leaves the environmentally-destructive contradictions of capitalism unaddressed. In addition, the very spatial arrangements of zoos and aquariums are worrisome in that they perpetuate an attitude of an *I* to an *It*, to borrow from Buber (1970)—one separated by discrete bounds—an exceptionally anthropocentric view of nature paralleling Louis XIV's menagerie for viewing exotic animals as "the metaphorical expression of His Majesty's absolutism" (Beirne, 2014: 51; see Halsey, 1999 on how an Australian marine park reinforced a division between discrete understandings of "human" and "nature").

While the prior discussion is applicable to both zoos and aquariums, I will now focus on a rather explicit example of the ideological work performed by public

aquariums: the AZA-accredited Audubon Aquarium of the America's "Gulf of Mexico" exhibit in New Orleans. As per its website description the Gulf of Mexico exhibit, "measures 17 feet deep and holds 400,000 gallons of man-made saltwater. It is packed with sharks, schools of fish, sting rays, and sea turtles- including King Mydas an endangered green sea turtle" (Audobon, 2015). At the center of the tank sits the crown-ideological jewel, "a quarter-scale replica of an offshore oil rig" designed to let individuals "meet the aquatic animals that thrive around its barnacled pilings." This exhibit is sponsored by five oil companies with vested interest in maintaining green(washed)² images and drilling operations in the Gulf: BP, Shell, ExxonMobil, Chevron, and Kerr McGee.

When I visited the Audubon Aquarium's "Gulf of Mexico" exhibit in 2013, I could not help but observe the distinct lack of "conservation education" related to the environmental destruction wrought by the 152-day BP Deepwater Horizon oil disaster that poured 210 million gallons oil into the Gulf in 2010 (Beirne, 2014: 59). Nor was there any aquarium sponsored education related to the effect of BP's use of 1.84 million gallons of toxic Corexit 9500A and 9527A chemical dispersants that were injected directly into the Deepwater Horizon wellhead and sprayed over the surface of the ocean—a figure that makes the 5,500 gallons of dispersant used in the Exxon Valdez spill pale in comparison (Bradshaw, 2014: 170). Typically, chemical dispersants are used to

² 'Greenwashing' typically refers to the utilization of green imagery, token-gestures (e.g. small donations to 'conservation' organizations), and other public relations efforts that corporations use to mislead the public about the true environmental consequences of their company or industry's practices and products, thus providing a false or over-inflated impression of 'environmental friendliness' (See Simon, 2000: p. 642). For an example of the Chevron Corporation's greenwashing practices see Lynch & Stretesky (2003), p. 220-222.

sink and disperse oil throughout the water column, thus preventing the spilled oil from reaching and affecting shore ecosystems—a measure that comes at the expense of offshore ecosystems and one guided by a utilitarian calculus of "net environmental impact." BP, in collusion with the U.S. Coast Guard, completely disbanded any veneer of a utilitarian environmental calculus, however, and deployed copious amounts of the dispersant in a strategic attempt to conceal the damage of the spill from the media—an effort that also included blocking of beaches and harassing journalists (Bradshaw, 2014; see documentary *Dirty Energy* by Hopkins and Stencel, 2012). All the while, BP deployed a "no harm" technique of neutralization—neutralizing *the public*, that is—claiming that the Gulf of Mexico was so large that the amount of oil and dispersants pouring into it was negligible (Bradshaw, 2014: 170).

At the height of the disaster the National Oceanic and Atmospheric Administration (NOAA) banned fishing in 37% of federal waters in the Gulf spanning an 88,522 square mile (229,270 square kilometer) area (NOAA, 2016). The maximum size of the oil slick itself extended an estimated 28,958 square miles (75,000 square kilometers) with "the extent and location of the slick changing from day to day depending on weather conditions" (Cleveland, 2010). BP's actions in the immediate aftermath of the disaster and in the Audubon Aquarium's "Gulf of Mexico" exhibit—a cheap, greenwashed token gesture to the public—reflect the extent to which oil companies are truly concerned with aquatic life. Perhaps more revealing is the AZA's complicity, through public news releases, in BP's efforts to help rehabilitate its image by using the language of "spill" and focusing solely on the importance of AZA-accredited zoos and aquariums in research and

rehabilitation efforts related to preserving impacted wildlife. Not a single word in these news releases criticized BP's negligent role in the production of this particular instance of widespread ecological disaster. As producers of ideological work the Audubon Aquarium of the America's exhibition and the AZA's official responses to the oil "spill" serve to reify a "cultural silence" in which our global reliance on fossil fuels, and the associated environmental disaster this reliance produces, remain unquestioned (See Websdale and Ferrell, 1999: 349-350 on cultural silence; see Brisman, 2012: 61-63 for the cultural silence produced by climate change contrarianism).

The utilitarian discourses of welfarism and conservation displayed here and deployed elsewhere by the AZA and member aquariums thus serve as mere logs in a voracious treadmill of production where "the aim of such development is to operate within the context of global capitalist markets, rather than to challenge the logic of these forms of production and consumption" (Halsey and White, 1998: 351). By encouraging "conservation action" behaviors primarily centered around minor shifts in individualistic acts of conspicuous consumption, the AZA and aquariums merely reinforce the capitalistic political economy of consumption where, drawing inspiration from White (2002: 86), the issue ultimately becomes the conservation of a particular speciesist, anthropocentric social order, rather than conservation as such.

It may be argued that the AZA and member institutions still do important conservation work and research (see, e.g., South et al. 2013: 34), even while being sites of ideological work supporting capitalism. Nevertheless, we must not lose site of the speciesist mammalian-bias of this work. When it comes to species-specific field

conservation projects, an estimated \$154 million was spent by AZA member institutions in 2014, however only 4% of these projects focused on fish—the lowest of any category in comparison to 55% of projects focused on mammals and 14% each on birds and reptiles (AZA, 2014: 5). Such mammalian-bias is even more pronounced when looking at *research* conducted by AZA member institutions: of approximately \$21 million spent on research projects on over 700 species in 2014, 69% of these projects focused on mammals, compared to 4% on fish; birds and reptiles had 11% and 8% of the pie respectively (AZA, 2014: 13).

CHAPTER IV

THE IMPACT OF THE PRIVATE MARINE AQUARIUM TRADE

Having explored the ways in which public aquariums perpetuate the hegemonic anthropocentrism of capitalism, I will now focus on the means whereby the treadmill of production facilitates the commodification of nature, particularly both coral and fish, through the private U.S. marine aquarium trade. Sollund (2011: 442) identifies the use of cages on companion animals as undermining that very companionship through the enforcement of captivity, with the cage itself "establish[ing] a solid physical and mental barrier to nearness," resulting in speciesist objectification of the animal as property. Fish are unique in that they cannot survive without the "cage," perhaps establishing an inherent material basis within their companion animal status that predisposes them to treatment as property which "may in turn legitimate other abuse, just as the abuse and death of animals destined for material use is "legitimated" by their property status (Beirne, 1999)" (Sollund, 2011: 443). Such psychological barriers and property classification of fish may also serve to further fuel the marine aquarium fish trade in particular, in that if a fish, understood as *object*, dies within an owner's aquarium one need simply purchase another with little emotional involvement. This is evident in the ways that many stores that sell fish offer various forms of money-back guarantees. For example, the Red and White Ryukin Goldfish, Item 36-4032756, which retails at PetSmart for \$12.47, comes with the following "Vet Assured™ Promise":

All pets purchased at PetSmart are raised under our exclusive Vet Assured program and come with a 14-day satisfaction guarantee. Vet Assured is a program designed

by PetSmart veterinarians to improve the health and well-being of our pets. The program sets standards for the care of our pets by our live animal partners and store associates and establishes strict standards for the monitoring and prevention of common illnesses found in pets. PetSmart makes a significant investment in the care of our pets and it is apparent in the quality and comfort of the pets in our stores. However, if your pet becomes ill during this initial 14-day period, or if you're not satisfied with your pet for any reason, PetSmart will gladly replace the pet or refund the purchase price. Please keep your sales receipt and return the pet to the store where it was purchased if needed (PetSmart, 2015).

Overall, the U.S. demand for marine aquarium pets is fueled by approximately 1 million hobbyists in a trade wrought with systematic instances of individual animal abuse as well as major environmental destruction and ecological disorganization. At the individual level, given the relative inability to distinguish recognizable cues of potential suffering in individual fish, it is important to illustrate types of abuse that may easily be overlooked. Table 1, adapted from Huntingford and colleagues (2006: 356-358), indicates a range of specific instances of potential animal abuse throughout the treadmill of production inherent in not only the marine aquarium trade, but also applicable to those fish stored in public aquariums.

Table 1. Examples of sources of abuse, morbidity, and mortality in ornamental fish keeping practices³

Practice	Some demonstrated effects on the health of fish
Capture	The usual process of capturing marine tropical fish in Indonesia and the Philippines through the use of sodium cyanide results in very high mortality rates for several weeks after capture (Hignette, 1984), with estimates ranging up to 80% (WWF, 2013). Mortality during capture of ornamental fish from South America ranges may be as high as 30% (Ferrez de Olivera, 1995).
Transportation	In South America a further 5–10% mortality is estimated to occur during transportation and at the holding facilities (Ferrez de Olivera, 1995). During the acclimation period following importation, mortality rates can be up to 30% (FitzGibon, 1993). Shipping of zebra fish (<i>Brachydanio rerio</i>) by road in oxygenated bags causes elevated cortisol levels but recovery is rapid on transfer to aquaria (Pottinger & Calder, 1995). Elevated cortisol and glucose levels are used as a measure of stress in fish and high levels of cortisol can result in immunosuppression and derivative health deterioration (Weyts et al., 1999).
Handling	Physical disturbance evokes a neuroendocrine stress response in many species of farmed fish (reviewed by Pickering, 1998) and reduces disease resistance (Strangeland et al., 1996). Handling stress increases vulnerability to whitespot disease in channel catfish (Davis et al., 2002).
Constraint in a confined space	Physical confinement in otherwise favorable conditions increases cortisol and glucose levels and alters immunological activity in various species (Garcia-Garbi, 1998). Carp (<i>Cyprinus carpio</i>) show a mild, physiological stress response to crowding that decline as the fish adapts, but crowded fish are more sensitive to additional stressors (e.g., confinement in a net) (Ruane et al., 2002). Crowding during grading (the process of sorting fish based on size) increases cortisol levels for up to 48 hours in Greenback flounder <i>Rhombosolea tapirinia</i> , Gunther (Barnett & Pankhurst, 1998).

³ The research compiled in this table is primarily based on studies of individual species in the field of marine and fish biology. The categories and examples provided are derived from a broad overview of the literature by Huntingford et al. (2006) and are thus illustrative and not exhaustive. A more holistic and exhaustive review table would undoubtedly contribute to the animal abuse literature, but such an endeavor is outside the scope of this thesis.

Table 1. (continued)

Practice	Some demonstrated effects on the health of fish
Poor water quality	81% of ornamental fish are held outside the optimal pH range, 36% at inappropriate temperatures (Etscheidt & Manz, 1992). Poor water quality is the most common cause of mortality in ornamental fish (Schunk, 1980).
Inappropriate food levels	Inappropriate range and types of food can cause poor health in ornamental fish (Etscheidt, 1995). Inappropriate feeding is not usually a direct cause of mortality in ornamental fish, but can be a contributory factor (Schunck, 1980).
Health treatment	There is evidence therapeutic treatments themselves may be stressful to fish (e.g., Yildiz & Pulatsu, 1999; Griffin et al. 1999, 2002; Thorburn et al., 2001; Sørum & Damsgard, 2003).
Deprivation of social contact	Angelfish transferred singly to a new tank take longer to resume feeding than those transferred in groups of 3 or 5 (Gomez-Laplaza & Morgan, 1993).
Inappropriate species combinations/ Unavoidable contact with predators	Lack of appropriate social environment (wrong species or inappropriate numbers) is an important cause of poor health in ornamental fish (Estcheidt, 1995). In 19% of ornamental tanks, prey were housed in small tanks in direct contact with predators (Etscheidt & Manz, 1992; Foggitt, 1997). Brief exposure to a predator causes increased cortisol levels and ventilation rate and suppressed feeding (e.g. Metcalfe <i>et al.</i> , 1987).

Table 1. adapted from: Huntingford et al. (2006) 'Review Paper: Current issues in fish welfare', p. 356-358.

At the level of ecological disorganization, over the past two decades, the purchasing preferences of aquarium hobbyists have increasingly moved towards ecosystems mimicking the aesthetic of full reefs, versus fish-only tanks. This consumption pattern has resulted in the commodification and abduction of both fish and the coral habitat in which they live, "with a premium on both biodiversity and scarcity [where] critical ecological roles are particularly vulnerable" (Rhyne et al., 2012: 1; see also Rhyne et al.,

2009). Both coral and fish specimens are primarily extracted in Southeast Asia with a significant amount of coral being extracted from China and the vast majority of both coral and fish extracted from the Coral Triangle area (primarily from Indonesia and the Philippines but including Malaysia, Papua New Guinea, the Solomon Islands, and Timor Leste). The Coral Triangle is the most biologically diverse marine ecosystem in the world and "the most seriously threatened, with 40% of reefs effectively lost, 45% under threat, and 15% at low threat" due to a combination of local and global environmental factors (Hoegh-Guldberg et al., 2009: 5-6).

Coral habitat broadly serves in the most critical ecological role for countless marine species including fish, but the trade in coral has been profoundly shaped by the marine aquarium fish trade itself. Utilizing the CITES Trade⁴ Database, which monitors the trade in threatened and endangered species including over 2,000 species of coral, Green and Shirley (1999: 1) analyzed the legal global trade in coral from 1985 to 1997 calculating that the U.S. imported 56% of the total global market (just under 10,800 metric tonnes). For this time period Green and Shirley (1999: 21) estimate that 76% of all coral reef trade by weight was "for commercial purposes, presumably with dead corals supplying the ornamental trade and the live aquarium industry." While the majority of coral during this period was traded dead (86% by weight), by 1997 the trade in live coral had rapidly

⁴ The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is an international trade agreement between 181 nations designed to regulate the trade in plant and animal species so that such trade does not result in extinction. CITES covers 5,600 animal and 30,000 plant species through three Appendices: Appendix I species are threatened by extinction (international trade in such species is prohibited, but there are exemptions); Appendix II species are not yet threatened by extinction but 'may become so unless trade is closely monitored'; and Appendix III species are protected by at least one CITES member country that asks other member countries to help control the international trade in that species (CITES, 2015).

increased to dominate between 53-56% of total global trade due primarily to the growth in popularity and changing aesthetic-based consumption habits of the marine aquarium fish trade enthusiasts in North America and Europe (1999: 26-27). Between 1986 and 1997 96% of all coral traded globally originated in the wild with Indonesia dominating exports (41% of global exports; followed by China at 24% and the Philippines at 18%) (1999: 11). In 1973, 1977, and 1980 the Philippines government took measures to completely ban the harvesting and export of coral due to environmental concerns, however until the late 1980s the Philippines and Indonesia, which had no bans, still exported approximately the same amount of coral annually. Philippine collectors and poachers (using similar tactics to others across the region) have historically taken advantage of loopholes, mislabeling of wares, forged permits, confusion between governments, and lack of oversight (all exacerbated by temporary lifts in export bans in 1986 and 1992 meant to allow traders to clear old stock) to continue the illegal export of new coral (see Mulliken and Nash, 1993; Elliott, 2007). When the Philippines 1992 export ban was restored all legal trade in coral rapidly dropped off prompting a rise in legal exports from Indonesia to meet global demand (Green and Shirley, 1999: 12).

The size of the illegal coral market (and broader illegal marine trade) in Indonesia, China, the Philippines and elsewhere is unknown but likely significant in the context of East Asia and the Pacific where an estimated USD \$2.5 billion is generated annually from the illegal trade in wildlife (Elliott, 2007; UNODC, 2013). The proliferation of the marine aquarium fish trade and corresponding increase in demand for live coral in the 1990s provided lucrative economic incentives for legal and illegal trade alike with "the

retail value of the international trade in live corals [quadrupling] during the 1990s... and generat[ing] between \$27-78 million in sales in 1997" (Green and Shirley, 1999: 50). These high sales prices in importing nations translated to approximately \$5 million in legal revenue for exporting nations in 1997, a significant revenue stream for coral gatherers who, for example, in Cebu, Philippines "were paid US \$0.20 per piece of coral in 1983 (Ross, 1984)" (Green and Shirley, 1999: 51). Indeed, a metric tonne of living coral is estimated to be worth USD \$7,000 while a metric tonne of coral harvested to produce limestone only fetches around USD \$60 (Wabnitz et al., 2003: 9). Trade in endangered and threatened coral species is even more lucrative with CITES Appendix-II protected black coral, almost exclusively used in the ornamental and jewelry trade, fetching as much as USD \$350,000 per metric tonne⁵. While the demand for black coral is not directly linked to the marine aquarium fish trade like the demand for living coral is, both types of coral collection and commodification can and do take place on both the legal and black market. It stands to reason that both trades may utilize very similar if not the same human pathways along the treadmills of production that connect the coral and

⁵ It can be instructive to analyze the treadmill of production at various points between initial harvesting of nature (the beginning of inputs to the treadmill), through the transport and processing of that harvested material, to the sale of it in its final processed form on markets (end of the treadmill). In terms of black coral, an example at the beginning of the treadmill (right after the initial harvesting of nature in the form of black coral) comes from Manila, Philippines where in 2011 poachers harvested at least 21,000 black coral specimens and killed at least 161 endangered sea turtles. The specimens were packed in two vans destined for exports, both falsely labeled as containing 'rubber' when the Philippines Bureau of Customs intercepted them. The harvesting of these black coral specimens is estimated to have destroyed as much as 191 square kilometers of habitat (five times the size of Manila) that supported thousands of other species (see more at Tubeza, 2011a; 2011b). As an example toward the end of the treadmill (between transport and final sale on markets), the figure of \$350,000 per metric tonne of black coral was calculated from the U.S. Department of Justice's largest ever indictment of a U.S. company knowingly trading in falsely-labeled black coral supplied by a Taiwanese company operating through China. On top of a USD \$1.8 million criminal fine the jewelry company GEM Manufacturing LLC 'was also ordered to forfeit dozens of jewelry items, ten artistic sculptures and over 13,655 pounds of raw black coral, the total value of which, at current prices, exceeds \$2.17 million' (see more at DOJ, 2011).

marine aquarium fish trade: starting with impoverished coral and fish gatherers attempting to make a living, traveling through various middlemen making significantly more profit moving product out of the country, and onto the markets of developed countries (see Elliott, 2007; UNODC, 2013: 75-86; Green and Shirley, 1999: 51; Mulliken and Nash, 1993). To more fully integrate this argument though I now turn to the side of the treadmill dealing with marine fish in particular.

Rhyne and colleagues (2012) attempted to estimate the size and biodiversity of the virtually unregulated (and thus un-tracked) non-CITES U.S. marine aquarium fish trade; they compared shipment declarations, which must be produced for the U.S. before the importation of fish and other animals, with commercial invoices for each shipment between May 2004 and May 2005. Their findings indicate a grand importation total of nearly 10.5 million fish of over 1,800 species with "the Philippines and Indonesia account[ing] for 86.6% of [U.S.] imports 5,774,579 (55%) and 3,288,434 (31%) individuals, respectively"—a total of over 990 species represented between the two countries (Rhyne et al., 2012: 7). This is necessarily an underestimation of the total fish impacted by the U.S. market given that: it does not include CITES species (see Sollund, 2011 on the anthropocentric limitations of CITES); it does not account for illegal trafficking (see Elliott, 2007; UNODC, 2013: 75-86); it does not reflect the number of marine fish traded within the U.S. that derive primarily from Hawaii (see Tissot and Hallacher, 2003 on the environmental impacts of the marine aquarium trade in Hawaii); and it does not include the number of fish that died during or after capture (but before export). This considered, it is clear there is a significant amount of individual cases of

animal "abduction" (see Sollund, 2011: 438 on the use of the word "abduction", instead of poaching, "to emphasise that birds and animals are born free and do not belong to anyone"), as well as ecological withdrawals and potential ecological disorganization in terms of the quantity and biodiversity of fish affected along this treadmill of production (see Lynch et al., 2013).

To illustrate further the ways in which the U.S. marine aquarium fish trade contributes to the death of individual fish, as well as to their coral reef habitat (beyond the harvesting of living and dead coral specimens outlined above), consider how the death of coral reef fish are widely facilitated in the Philippines and Indonesia through attempted capture using poisons (primarily sodium cyanide) that are squirted directly into coral reefs in order to stun the fish. Aside from extremely high fish mortality due to toxic poisons, this process produces ecological withdrawals in the form of coral destruction because "[t]he application of dilute solutions of cyanide will disrupt photosynthesis and cause corals to bleach and die... and if applied at higher concentrations will kill entire communities of corals" (Hoegh-Guldberg et al., 2009: 57). The World Wildlife Fund-Philippines (2013) estimates that, due to such destructive extraction practices and other environmental stressors involved, up to 80% of marine fish captured for the marine aquarium trade die before ever being sold, with an overall estimation of 98% of wild-caught fish dying within the first year. With this figure in mind, it stands to reason that the roughly 9.06 million live marine fish, abducted, sold, and imported to the U.S. in 2005 (Rhyne et al., 2012) is indicative of a much larger 36.3 million fish who were victims of abduction and subsequent theriocide.

The massive scale of death and ecological disorganization caused by the marine aquarium fish trade's treadmill of production receives at least partial direct support from public aquariums, despite those greasy discourses of "conservation" and "animal welfare". Rhyne and colleagues (2012: 7) found that "[p]ublic aquariums significantly overlap with the home hobbyist aquarium trade, as 54% of the species held in public aquariums were imported into the U.S. in 2005... [with] many [public aquariums] source[ing] fish from commercial retail sources." It is difficult to estimate the exact number of marine fish that public aquariums obtain from those "commercial retail sources", those treadmills of production that start in wild reefs, however it is likely significant due to the almost nonexistent amount of breeding of marine ornamental fish that takes place in captivity (Tlusty, 2002). Whether perpetrated by the ideological anthropocentrism of the public aquarium or the seemingly benign private hobbyist, within the intertwined treadmill of production of the marine aquarium fish trade, encompassing fish and coral alike, we see the intersection of four of the seven major sites of theriocide that Beirne (2014: 58-59) lays out: fishing, trafficking, and pollution as explicit components in the foreground; and the support of discourses that facilitate climate change in the background, thus further acidifying oceans, bleaching coral reefs, and leading to the death of countless marine species (Hoegh-Guldberg et al., 2009).

CHAPTER V

CONCLUSION

This thesis has situated fish as worthy of inclusion within Singer's (1975) utilitarian and Regan's (1983) "subjects-of-a-life" moral frameworks, and, in so doing, has called for heightened attention to their place within the animal abuse literature. In addition, this thesis has proposed utilizing an integrated "treadmill of production" and green-cultural criminology of consumption framework in order to improve our understanding of the various specific, dispersed, and intertwined instances and sources of animal abuse as perpetuated in ideological and political economic dimensions. To better illustrate this framework, this thesis has explored the anthropocentric and speciesist ideological work of public aquariums that, through utilitarian discourses of "conservation" and "welfarism," serve as cultural grease for an anthropocentric worldview necessary to perpetuate the specific abuses and widespread ecological disorganization perpetrated in the treadmill of marine aquarium fish production, against fish and coral reefs alike.

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