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Leave only footprints? Reframing Climate Change, Environmental Stewardship, and Human Impact

By Monica Aufrecht

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Abstract

Cheryl Hall has argued that framing of climate change must acknowledge the sacrifices needed to reach a sustainable future. This paper builds on that argument. Although it is important to acknowledge the value of what must be sacrificed, this paper argues that current frames about the environment falsely portray humans and the environment as in a zero-sum game, and in doing so ask people to give up the wrong things (namely, their humanity and sense of self). This could undermine the public's trust in environmentalism, and might even create a backlash against action on climate change. I propose we need alternative framing that portrays humans as a keystone species, and highlights positive human activity.

The wild can be human work.
Helen Macdonald

Discussions about climate change and human impact are necessarily framed. Cheryl Hall reminds us that all frames are partial, emphasizing some aspects of a situation while minimizing other aspects. Yet, frames are unavoidable. The question is not whether to frame a conversation, but which frame to use (Hall 2013, 5).

Current framing around environmentalism, and around climate change in particular, is not working as well as it could. Two frames of climate change dominate among environmentalists: one is optimistic (a few changes can make a big difference), while the other is “doom and gloom” (focusing on the steep costs of inaction). As Hall points out, these narratives can both be true. They are simply highlighting different aspects of the same story. But Hall argues that the optimistic frames do not go far enough, and Hall cites several studies that show that ‘doom and gloom’ imagery is not particularly good at inspiring the real changes that are

needed to mitigate climate change (Feinberg & Willer, 2011; Feygina, 2010; Moser & Dilling, 2004; Nordhaus & Shellenberger, 2009; O'Neill & Nicholson-Cole, 2009; Revkin, 2006).

The doom and gloom frames can lead to despair and disbelief, and the general sense that no action is worth taking, since we are doomed anyway (Hall 2013, 7, Ereaut & Segnit 2006). For instance, O'Neill and Nicholson-Cole demonstrate that fearful images that made climate change seem important to study participants (e.g. pictures of a dried up lake with dead fish, or of starving children in a famine) were the very same images that invoked the most feelings of hopelessness, thereby undermining motivation to act. Study participants tended to create associations between climate change and negative feelings, and thus a desire to simply change the subject (O'Neill & Nicholson-Cole, 2009).

A good illustration of this is the response to Mark Lynas's book *Six Degrees: Our Future on a Hotter Planet*. Lynas was surprised that readers found his book depressing. Depressing, he claimed, is when you cannot do anything to stop a bad thing from happening. The most negative effects of climate change, however, are still largely preventable. Yet rather than being inspired to prevent the terrible outcomes outlined in the book, many of Lynas's readers resigned themselves to a doomed future (Ausubel 2012, 157).

In addition to invoking denial and apathy, researchers have shown that fearful images undermine motivation in several ways: people become desensitized, too much fear imagery induces skepticism, is seen as manipulative, and undermines trust in the messenger (O'Neill and Nicholson-Cole 2009, Moser & Dilling 2010).

The optimistic frames are not doing much better, however. Reformist frames that promise few sacrifices will not actually lead us to a solution (Mabon and Shackley 2015). Yet more radical frames that try to get us excited about a life beyond consumerism (Andreou 2010,

Schor 2010) do so by downplaying the true sacrifices involved (Hall 2013, 10). To truly fight climate change, Hall argues, will require painful sacrifices. We talk about taking shorter showers and getting more fuel efficient cars, but mitigating climate change might also mean little or no plane travel, drastically less driving, fewer imported foods, not to mention deeper structural changes to society and our economy (Author 2011). Not everything people will have to give up is worthless. “Refusing to acknowledge this fact risks a serious loss of credibility with the audience one is hoping to reach” (Hall 2013, 12).

In the end, according to Hall, we need a narrative that honestly and clearly lays out the sacrifices needed to achieve our goal of reduced carbon emissions and a more stable climate. But what exactly that narrative will be, she left open:

For environmental thinkers, then, the challenge is to help reshape imagination of what a greener future could mean in ways that articulate new possibilities without dismissing the value of what must be given up. (Hall 2013, 2)

So, Hall concludes, we need a message of hope that is still realistic about the sacrifices involved.

To follow this advice, we must carefully choose which *kinds* sacrifices we request of each other. In this paper, I suggest that some of the most popular frames in environmentalism actually undermine action on environmentalism, and by extension climate change, by asking people to give up the wrong things. Slogans such as “Take only memories, leave only footprints,” and “Tread lightly on the earth,” might inadvertently promote the narrative frame that all human activity is harmful for ecosystems. If so, this would create a sense of competition between humans and the environment, with the implied assumption that the competition is a zero-sum game. Such a frame emphasize that humans need *to do less* (polluting, consuming), rather than highlighting that humans must also do *more* (interacting with ecosystems through polyculture farming and sustainable forestry; creating new and better human systems of

exchange and economics). In doing so, such a frame would ask people to give up what it means to be human. Instead of framing humans and the environment as in a zero-sum competition and human touch as harmful to the environment, we should be framing environmentalism as a partnership relationship between people and the environment, and as human activity at its best.

The proposal of this paper is that we change the way we market Environmental Stewardship. To be clear, I am not promoting that environmentalists actually change what they *do*, but rather how they *talk about what they do*. Replacing “light touch” messages with “right touch” messages will help emphasize that not all human activity is harmful – much is beneficial. Rather than unintentionally forcing a choice between a decent human life or a thriving ecosystem, environmentalists can emphasize the interdependence of humans and our ecosystem. Instead of asking people to sacrifice their loyalty to humanity, new framing can show us a better way to be human.

This means creating a choice between human activities that deplete ecosystems or human activities that promote thriving ecosystems. This means moving beyond a “light touch” framing that focuses on preservation and conservation and toward a more active view of transformative stewardship. Only then will talk of “sustainable living” seem less threatening to those accustomed to a high standard of living, i.e. the people contributing the most to climate change and those with the most power to ameliorate it.

Finding the Right Frame

Hall argues that information alone is not enough to motivate. “What matters is how information is interpreted, what meaning it holds for people” (Hall 2013, 2). Empirical research backs this up. Giving study participants more information about the negative environmental

effects of certain actions does not reduce their intention to perform those actions, unless those people already care a great deal for environmental issues. (Gifford and Comeau 2011, Gifford 2014)

Information on the effects of climate change is plentiful, yet talk of the solutions – and environmentalism and “sustainability” -- remain unpopular in high emission countries like the United States. Although nearly 75% of people in the United States bought environmentally friendly products in 2010, only 62% were willing sign on to anything actually *called* “environmental” (Dunlap 2010, Curtis 2012). And while Americans are becoming convinced that climate change is happening, fewer than half see it as a major threat (and only 22% of Republicans see it as a threat), compared with 54% of people globally (Motel 2014, Wike 2014, Barker 2013). With our lives and livelihoods dependant on a healthy environment and on mitigating climate change, the profound lack of action by those with the most power can be bewildering¹.

Looking at the frames is one way to make sense of this inaction. Matthew Nisbet outlines several climate change frames in public debates (Nisbet 2009). Each frame highlights a different part of a problem, and in doing so points us toward different solutions. Thus which frame we use to discuss climate change can influence which solutions we choose to act on, if any.

Strikingly, some of the most popular frames for talking about climate change have actually contributed to increased carbon emissions. These include the frames of “scientific uncertainty,” “high economic costs to changing business,” and “unfair burdens” on Americans being asked to curb emission when other countries are not. Nisbet demonstrates how these

¹ Even after we have accounted for the perfect storm of a disperse cause and effect, fragmented agency, and institutional inadequacy (Gardiner 2006).

frames have stalled action by making any solutions to climate change seem too complicated, costly, or unjust. Indeed, these frames may have even been intentionally cultivated by people like the Republican consultant Frank Luntz in order to delay action. For instance, a private memo from the Luntz Research Group outlines these frames as strategies for “Winning the global warming debate.” It concludes, “The scientific debate is closing [against us] but not yet closed. There is still a window of opportunity to challenge the science” (Luntz Research Group 2003 pg 137-8, Nisbet 2009).

On the other side, many of the frames trying to convince Americans to act on climate change have also failed to motivate action. Frames about doom and gloom have been inspiring apathy (as seen above and as reported by Nordhaus & Schellendberger 2007, Revkin 2007a, Ereaut & Segnit 2006), or even disbelief. For example, in an attempt to spur action, Al Gore put forward a frame of climate change as opening a “Pandora’s Box” of weather catastrophes. Unfortunately, the backlash against this frame has been strong. Climate skeptics such as the influential U.S. Senator James Inhofe have pointed to the Pandora’s Box frame as evidence of liberal alarmism (Revkin 2007b).

Two frames, according to Nisbet, hold the most promise for inspiring positive action against climate change: “morality and ethics” and “economic development frame.” The morality and ethics frames “compare action on global warming to the U.S. Civil Rights Movement” and feature images of soldiers planting trees (Nisbet 2009, 8). The economic development frame points to green jobs, new technologies, and other ways that fighting climate change can be good for the economy.

The economic development frame is the very one that Hall (2013) and Mabon and Shackley (2015) criticize as being unlikely to solve the climate problem, since it leads us toward

more consumerism, rather than away from it. This frame focuses on tweaks and reforms that keep the current systems intact, such as the goal of economic growth, leaving little room politically to challenge the very systems that drive the problem (Mabon and Shackley 2015).

However, these frames seem to be working to motivate people, when the others have backfired. What can one learn from these frames that can help develop better ways of convincing the general public to act on climate change? Nisbet reminds of us what these two frames do well: they inspire. But what makes these frames so inspiring? *They reorient the discussion to positive human activity.* The morality and ethics frame draws on people's sense of duty, and evokes images of human courage rising to the challenge. The economic development frame focuses on human ingenuity and triumph over intellectual and technological struggle. These frames place humans as victors, not as victims; as saviors, not as criminals. They draw on the best aspects of humanity.

These elements of *morality* and *agency* are precisely what any climate change frame needs to have. Research shows that people are more likely to support pro-environmental measures when the measures 1) appeal to their sense of morality (rather than personal gain) and 2) focus on action (rather than depravation). For instance, a team of researchers including Linda Steg and Jan Willem Bolderdijk found that appeals to morality are more effective at getting people to act environmentally – and to feel good about doing it – than are appeals to personal or economic gain (e.g. “Do you care about the environment? Take a coupon for a free professional tire check!” is more successful than “Do you care about your finances? Take a coupon for a free professional tire check!”) (Steg, Bolderdijk, et al. 2014 p. 110, Bolderdijk, Lehman, et al., 2012; Bolderdijk, Steg, et al., 2012). Environmental psychologists Robert Gifford and Louise Comeau found that action verbs like “break,” “shrink,” and “grow” (e.g. “I can shrink my contribution to

global warming”) were most likely to draw support for mitigating climate change (Gifford and Comeau 2011 p.1306). Gifford and Comeau also show that priming people to associate climate change with what they must give up was much less motivating than associating climate change with the things that they can do about it: “I am going to have to get used to driving less, turning off the lights, and turning down the heat,” is less successful than “We help solve climate change when we take transit, compost, or buy green energy.” (Gifford and Comeau 2011 p.1302)

So to inspire the public in rich countries to act on climate change, we need narratives of morality paired with narratives of human agency. In particular, a new narrative of Positive Human Actions could replace the current ‘economic development’ frame. Will this new narrative turn out to be a narrative of sacrifice? It will have to include sacrifice, since inevitably we will have to sacrifice some actions in favor of others (less driving, more biking; less packaging and stuff, more experiences). Or is this a narrative of hope? It can be that, as well. The frame of Positive Human Action has the potential to be a narrative of both sacrifice and hope at the same time. The key, I argue, is that even as we ask people to sacrifice comforts that many in rich countries have grown used to, we must not ask people to give up our identity as humans, nor our very beings. Unfortunately, this is precisely what many current frames of “environmentalism” in popular culture do.

Existing Frames: Environmentalism in Popular Culture

Environmentalism has often entered the popular culture as a caricature. Consider the popular movie *The Matrix*, in which computer agent Mr. Smith justifies enslaving humans. He argues that, “Humans are a disease, a cancer of this planet.” Humans are, he claims, the only mammals that over-consume resources, that over-run their territory and move on to destroy new

territory. It turns out there is a name for this: an obligatory management species. This term was coined by Ron Howard and made more widely known by ethicist Gary Varner (Varner 1995). Varner defines an obligatory management species as a species “that has a fairly regular tendency to overshoot the carrying capacity of its range, to the detriment of future generations of it and other species” (Varner 1995, 95). These are species that destroy their environment when they are left unmanaged, and so there is an obligation to manage them.

Mr. Smith is not alone in viewing humans as a disease (see also Hern 1990, Lowenstein 1992). However, the fictional Mr. Smith was wrong on two counts. First, humans are not the only mammals that over-consume. Other mammals, such as deer, are also obligatory management species. As Aldo Leopold famously describes, when the wolf population was severely diminished in the U.S., deer started to overrun and destroy their own territory, leading to an explosion in the deer population and devastating the plants in the area (Leopold 1949). Second, as will be argued here, Mr. Smith is wrong that *all* humans are acting as an obligatory management species. Yes, many human groups do over-consume, but not all, and that is a crucial difference.

This same message (“All humans inevitably destroy the environment”) continued in the popular media. It could be seen ten years later in another Keanu Reeves classic, the remake of “The Day the Earth Still.”² These movies promote a certain view of environmentalism, namely the view that human life and other life are incompatible. Its narrative is that Humans and the Ecosystem are in competition, and that humans always damage the ecosystem. The implication here is that we are engaged in a zero-sum game with nature – if humans are to win, the

² Here, the alien visitor declares that human life is incompatible with a thriving ecosystem. In order to save the Earth, the aliens will destroy the human race. As the alien Klaatu argues, “If the Earth dies, you [humans] die. [But] if you die, the Earth survives.”

ecosystem must (unavoidably) be destroyed. And conversely, the narrative continues, if the ecosystem is to survive, as environmentalists say they want, the only way for this to happen is if the humans die, or at least make great sacrifices.

These might seem like extreme representations of Environmentalism. But there are other more prevalent messages that contain the same implications, even if they appear more benign on the surface. Consider a slogan made popular by Chief Seattle, “Take only memories, leave only footprints,” and another attributed to Gandhi, “Tread lightly on the Earth.” These peaceful, gentle metaphors imply the same message as our alien and computer enemies, only in a softer package.

“Tread lightly on the Earth” could be interpreted as saying that human touch is harmful. Indeed, it implies that our mere existence is a threat to ecosystems, plants, and animals, because at any moment we could overrun and over-consume, like a cancer. The implication of this “softer” message is that we as humans should *minimize* our interactions with ecosystems as much as possible. Indeed, we should minimize our very *selves*.

This message - that human activity is harmful and we should minimize human activity - is everywhere in U.S. culture. To take one example, the U.S. postal service sold stamps outlining fifteen things we can do to “reduce our environmental impact.” Nearly everything on the list is about doing less, being less: *drive less, lower your thermostat, hang dry your laundry*. The implicit message is that people must use less energy. Take up less space. Reduce your impact; minimize your harmful human touch. Only one item on this list models a positive human activity, and that is: Plant a tree. This is the only item that portrays human activity as positive for the environment, rather than harmful. It is a human touch that can actually enhance an ecosystem, rather than destroy it.

“Tread lightly” metaphor

I have speculated that messages like “tread lightly on the earth” and “take pictures and leave only footprints” imply that human touch is harmful to the environment. This raises an important question: does anyone actually hear these pro-environmental messages as implying that human touch is harmful?

Certainly, not everyone hears the “tread lightly” metaphor as implying that human touch is harmful. For instance, environmentalist Vandana Shiva does not interpret “tread lightly” to be creating conflict between humans and nature. Rather, it means to take only what you need (Haigh 2006, Shiva 2004).

In another example, one reviewer helpfully comments that “tread lightly” is a metaphor commonly used in other settings, such as kneading pastry dough. In those settings, the suggestion to use “light touch” does not mean that all touch is damaging, but rather that you must pay attention to how your kneading is affecting the dough, knead lightly, be aware of any negative effects and adjust your touch accordingly. Interpreted this way, “tread lightly” is the perfect metaphor for proper human-nature interaction.

Yet does everyone interpret “tread lightly” and “leave only pictures” as encouraging proper human touch, rather than no human touch? Initial research implies maybe not. For instance, environmental psychologists Doug Knapp and Raymond Poff interviewed fourth graders after a nature experience where the students were taught to “take only pictures, leave only footprints.” When interviewed months later, the students recalled the messages without prompting, but the wording had changed in their minds. The fourth graders recalled learning that “You can’t mess it up. When you leave it has to be the same way as you came” and you “are not

supposed to take anything in there that is not supposed to be in there that doesn't have to do with wilderness at all." So human touch is bad, and human things do not belong in wilderness areas.

(Knapp & Poff 2001 p. 62)

Sustainability expert Bruce Hull writes about his own experience with the "leave only pictures" message:

I followed a vegetarian diet, took short showers, turned off lights...I tried to take only pictures and leave only footprints. But I was painfully aware that by living my life, I created trails in the wilderness, trash in dumps, and carbon in the atmosphere. *I felt guilty about being human and destroying the nature I loved.* (Hull 2013, p. xi emphasis added)

The "leave only footprints" metaphor was creating in Hull's mind a conflict between being human and loving nature.

The influential environmental designers William McDonough and Michael Braungart also interpreted environmental messages to mean that human touch is bad:

The environmental message that 'consumers' take from all this can be strident and depressing: Stop being so bad, so materialistic, so greedy. Do whatever you can, no matter how inconvenient, to limit your 'consumption.' Buy less, spend less, drive less, have fewer children – or none. ... If you are going to help save the planet, you will have to make some sacrifices.... Sound like fun?" (McDonough & Braungart 2002, pg 6-7)

So, although not everyone interprets the "tread lightly" messages as saying that human touch is harmful, some people do. And further empirical investigations could reveal how many. This is an important question for further investigation, because, as I will argue below, the message that human touch is harmful actually undermines motivation for mitigating Climate Change.

"Humans Always Cause Damage" Frame

In Hall's sense, frames are narratives or even principles that highlight some aspects of a situation in order to communicate an analysis of a problem and its solution. Frames are partial,

not necessarily true (since they are oversimplifications), and unavoidable. (Hall 2013 p. 5)

I speculate that the environmentalist metaphors seen above, such as “Tread lightly on the earth” and phrases like “take only pictures leave only footprints,” can be interpreted by some as suggesting the narrative that humans and the environment are engaged in a zero-sum game - or fight - over finite resources, and that human interactions with the environment will always leave the environment damaged. According to this “Humans Always Cause Damage” frame, humans cannot live on this earth without damaging it. The goal might be to minimize that damage, but that damage is inevitable.

That is the narrative. What problems and solutions are highlighted by this narrative? This “Humans Always Cause Damage” narrative suggests that the problem of climate change is an inevitable result of human beings’ existence on the earth, and that there are only two possible solutions. Either humans must learn to live without the environment (since humans will take all they need and inevitably destroy the environment in the process) or all humans must die – or at least minimize their existence, thereby hampering civilization or any attempt at a flourishing human life.

So now we see that there are two claims made by the “Humans Always Cause Damage” frame. These claims are that:

- 1) “All humans are in competition with the ecosystem,” and
- 2) “All human touch is damaging to ecosystems.”

Above, I speculated that this “Humans Always Cause Damage” framing might be influencing how some members of the general public view environmentalism and the role of environmental stewardship, and in particular how they see the problem of Climate Change. I offered some

initial support for this speculation. Further investigation is needed to see if significant members of the public hear and believe this “Humans Always Cause Damage” frame.

In the next sections, I argue that, if so, then such a framing would be harmful because it would undermine the environmental movement (and may already be doing so) by forcing a choice between humans and the environment. Second, I show how these two claims within the “Humans Always Cause Damage” frame are false.

Two messages that force a choice between humans and ecosystems...

If this “Humans Always Cause Damage” frame were widely held, then it would undermine the environmental movement because it forces a choice between humans and ecosystems.

There have been many responses by the general public to perceived forced choices such as this one.³ Most infamously, when forced to choose between humans and the earth, Earth First! activists, for example, have chosen the earth. They have even adopted the slogan “No Compromise in the Defense of Mother Earth” (Earth First!). Other groups include the Voluntary Human Existence Movement, currently championed by Les Knight. He writes, “Phasing out the human race by voluntarily ceasing to breed will allow Earth’s biosphere to return to good health” (Knight 2001). The Church of Euthanasia has put this more bluntly with its slogan: “Save the Planet, Kill Yourself,” and its mission:

Every aspect of the deepening global environmental crisis, including climate change, poisoning of the water and atmosphere, reduction of biodiversity, and topsoil erosion, directly results from the over-abundance of a single species: homo sapiens.

³ Although many academics, scientists, and activists have avoided making a choice and have rightly recognized it as a false dichotomy (e.g. Plumwood 1991), many members of the public have felt the need to choose and have done so.

For these reasons, the Church of Euthanasia promotes voluntary reduction of the human race through extreme measures.

However, others, if they feel they must choose between humans and nature, choose humans (Smith 2013, Weeks 2007). For instance, writer for the Industrial Progress think-tank Alex Epstein recently took a stand on this choice by rejecting renewable energy:

Have you ever heard mankind described as a cancer on the planet? ... This is the logical end of holding human nonimpact as your standard of value; the best way to achieve it is to do nothing at all, to not exist. Of course, few hold that standard of value consistently, and even these men do not depopulate the world of themselves. But we need to depopulate the world of their ideas.

Our goal should not be the impossible idea of a form of energy that doesn't impact nature but the form of energy that most benefits human beings. We don't want green energy, we want life-enhancing, humanitarian energy." (Epstein 2016)

In particular, many people feel as if they are being forced to choose between a *good* human life, and one of arduous sacrifice. We might recall George Bush Sr.'s statement at the 1992 Earth Summit that "the American way of life is not up for negotiations." Comments on popular social media include statements that "doing the right thing" constitutes an unrealistic burden – perhaps even an impossible one. In one poster's mind,

If we had only bought products from local companies, that are good to the environment, pay a living wage, don't reinforce traditional gender roles, and have a small carbon foot print... [then our lives would have been] *very difficult* and unfulfilling. We definitely wouldn't have gone to a big ten university, drive cars... and we *probably would live naked, vegans in a tepee*... (Facebook comments 2014, emphasis added)

In another post, an influential climate skeptic wrote more bluntly: "Sometimes the friends of the earth are the enemies of mankind" (Cobb 2008).

Even environmentalist Bruce Hull, mentioned above, felt the power of this forced choice:

I had to ignore or suppress this guilt [about destroying nature] in order to stay sane while leading a professional, middle-class American lifestyle. ... As I struggled with being a hypocrite, it soon dawned on me that I am also a bigamist. I love both nature and culture. (Hull 2013, p. xi).

These are stark images of what it takes to be a good environmentalist. If one is trying to convince the general public to be good stewards, forcing them to choose between nature and culture is not good public relations.

Empirical research by environmental psychologist Wesley Schultz reveals that people's concern for the environment can be divided into three categories: 1) concern for one's own future ("egoist"), 2) concern for all humans ("altruist"), and 3) concern for plants and animals ("biocentric") (Schultz 2000, Schultz 2001). Moreover, there is substantial evidence that shows that people who consider the environment to be a part of their identity are more likely to support environmental actions, whereas those people who perceive there to be a strong divide between themselves and the environment are less likely to support environmental actions (Schultz 2000, Schultz 2001, Gifford 2014, Davis et al. 2009, Dutcher et al. 2007, Mayer & Frantz 2004). Schultz concludes from his surveys that, "Different types of environmental concern result from the degree to which an individual perceive an interconnection between self and nature" (Schultz 2001 p. 10, cf Schultz 2000 p. 394).

For people who have only human concerns, the perceived forced choice between human civilization and the environment is a simple one. For those with both human and biocentric concerns, the perceived forced choice can be agonizing. In neither case is supporting the environment and mitigating climate change the clear and easy option that it needs to be. Cheryl Hall argues convincingly that we need to frame climate change as a situation that requires true sacrifice, and not pretend that the changes will be easy for Americans and others in developed

countries. However, what exactly do people need to sacrifice? Asking Americans to sacrifice being human is asking too much.

...and undermine environmental solutions

These messages are bad public relations for another reason. By fostering the notion that human touch is bad for the environment, these messages undermine restoration and stewardship programs. “Stewardship” is considered a fraught concept among environmentalists, implying ownership and control. Yet, as Jennifer Welchman points out, policy makers and members of the public often use the word “steward” without intending these anthropocentric connotations (Welchman 2012). So it remains a popular way to talk about environmentalism. Moreover, “stewardship” implies action and this action is exactly what we need to ensure the continued survival of our ecosystems.

Yet the claim that “All human touch is damaging to ecosystems” undermines active stewardship. Stewardship programs require positive human touch, but under a “Humans Always Cause Damage” frame, such touch becomes an oxymoron, an impossible contradiction. We can see people grapple with this contraction when they offer a common objection to restoration projects: “How could an environmentalist ... Cut down a tree? Burn a forest?” (see Vining et. al. 2000, p 145) Yet, this anthropogenic transformation is precisely what many successful restoration projects involve.

That means that these two messages -- “All humans are in competition with the ecosystem” and “All human touch is damaging to ecosystems” -- not only pit humans against the environment and undermine stewardship unnecessarily. They are also false. These messages falsely represent what stewardship entails.

Restoration projects, in particular, require intense human activity and “touch.” This human activity is the opposite of a “hands-off,” “take only pictures” approach. For example, an Audubon Louisiana wetlands restoration project in New Orleans in 2012 involved taking a beautiful, thriving Tallow forest and cutting it down, and then spraying the tree stumps with poison to make sure the invasive tallow trees could not grow back. This was all to make space for the native cypress trees that provide the right habitat for wetlands. The wetlands provide the hurricane buffer that is so desperately needed in New Orleans. This is a far cry from “Take only pictures, leave only footprints.” And this is by no means a “tread lightly” project. But it is exactly the kind of restoration project that can contribute to sustainable, thriving ecosystem, rather than a limited, short-lived one. (Audubon 2012)

Marcello di Paola offers another example of humans enhancing an ecosystem by actively transforming it, rather than leaving it alone (Paola 2013, 517-519). Di Paola paints a picture of gardening as a way to engage individuals in meaningful environmental stewardship. Pointing out the environmental benefits of permaculture gardening, di Paola argues that the personal acts of such gardening can empower people and give them tangible feedback on their actions, while helping them do their individual part to mitigate climate change. This is an excellent example of Positive Human Action environmental stewardship, since it creates a visceral demonstration of a partnership between humans and the environment for those people involved, rather than a feeling of competition. And as environmental psychologists such as Schultz have found, this feeling of connection, rather than competition, is crucial to motivating people to act for the environment. (Schultz 2000, Schultz 2001).

Scholars and activists involved in restoration projects already know that Positive Human Action is not only possible, but often required. This is not news to environmental researchers

either, though it has been a matter of some debate. Baird Callicott, among many others, has argued that human intervention is needed to maintain balanced ecosystems (Callicott 1995). We actively manage forest and wilderness areas, and, as Callicott has argued, these “wilderness areas” are not pristine, untouched areas of land, nor do they need to be. For instance, The Nature Conservancy partners with local foresters to actively manage forests, including allowing controlled fires and carefully determining which trees to cull in order to cultivate a healthy forest, not simply one that can be harvested longer.

I argue that a frame that identifies good stewardship as Positive Human Action, rather than as treading lightly, can reorient the discussion of environmentalism onto ways that individual human actions can improve ecosystems. It also allows us to think about how human societies, even whole civilizations, can improve on natural environments, not just take from and destroy them.

Bruce Hull, William McDonough, and Michael Braungart also conclude that we need to recognize the positive ways in which humans contribute to ecosystem flourishing. For instance, McDonough and Braungart write,

In the midst of a great deal of talk about reducing the human ecological footprint, we offer a different vision. What if humans designed products and systems that celebrate an abundance of human creativity, culture, and productivity? That are so intelligent and safe, our species leaves an ecological footprint to delight in, not lament? (McDonough & Braungart 2002, pg 16)

Karim Benemmar and Noam Gressel interpret McDonough and Braungart as promoting a “positive footprint”:

We do not want to sustain the human race: we want to flourish. ... Instead of thinking about reducing human beings’ negative footprint as much as possible, why not design a positive footprint? (Benammar and Gressel 2015)

There is good reason to believe that this “positive footprint” has already been in effect. There have been exciting developments in archeology that suggest the thriving Amazon forest in Brazil is the product of intense human intervention. Baird Callicott, Charles Mann, and others have been investigating the controversial claim that humans actually created the rich soil of the Amazon centuries ago. The claim is that humans intentionally and systematically burned plants to create “Terra Preta,” or biochar, which is a rich soil that can support a much more diverse and thriving ecosystem. (Mann 2002, Denevan 1998, Denevan 2002, Bowdin 1992, Hayashida 2005). If true, this would be an astounding example where humans have not acted as an obligatory management species at all, but rather as the opposite: a keystone species. This is a species that supports and promotes an ecosystem and keeps it running through active intervention (Paine 1966, 1969). Such species are “the keystone of the community’s structure, and the integrity of the community and its unaltered persistence through time, that is, stability, are determined by their activities and abundances” (Paine 1969, 92). Indeed, the very concept of an obligatory management species implies that someone, such as a human being, is there to act as a manager and regulator, thereby benefiting the entire eco community by keeping the obligatory management species in check.

Regardless of whether people of the Amazon really did this (and controversies remain), it is possible in theory. And it is that possibility that needs to be clear in the minds of the public. Yes, human touch can be harmful, and human touch can be neutral. But human touch can also be beneficial. We do not need to minimize ourselves and our communities; we do not need to remove all human groups from all “wilderness areas” (Guha 1989) and we do not need to reduce our quality of life in order to live and work in a way that supports sustainable and thriving

ecosystems (Naess 1973). Rather, we need to be thoughtful, reflective, and responsive to the different experiments of human activity.

Indeed, this is how many forest managers, scientific researchers, and environmental activists are already behaving. They are manipulating forest composition in Oregon and studying the results (Warring 2007); they are tracking and supporting migrating turtles across the Pacific (Nichols et al 2000); they are cultivating wasps to control crop diseases (Mohan 2015). Currently, our framing (“Tread lightly”) makes these projects appear to be contradictions. Instead, we need framing that makes these projects visible; we need vocabulary (“right touch”, “Positive Change,” “Beneficial transformations”) that celebrates and encourages the successes of human activity and human stewardship.

Possible Objections

One might acknowledge the above examples of restoration, but claim that these are actually instances of light touch, “Humans Always Cause Damage” framing in disguise. Yes, one might concede, human restoration projects improve existing environments by changing them in extreme ways. However, it may be claimed, many of those changes are intended to bring about the conditions that existed *before* any human interaction at all. Cutting down the tallow trees in wetland areas, one might argue, is simply removing trees that humans introduced in the first place, and allowing the habitat to return to its previous state.

While I agree that this is often the (praiseworthy) aim of restoration projects, this goal of “returning to the original state” is not the only way that humans can interact with ecosystems. The creation of biochar in the Amazon was not a case of humans returning the soil to a previous

state, but rather one of creating a new, better ecosystem than the one that existed without humans (Mann 2002, Denevon 2011).

One might also object to the idea that we need a new frame by pointing to the successes of the “Humans Always Cause Damage” frame. Too many human developments have used a heavy touch, ignored local ecosystems, and ended up destroying them. But, one could argue, developments that aim for a “light touch” try to minimize damage to local flora and fauna as little as possible. Programs such as LEED certification aim to create buildings that use more efficient heating and cooling systems, solar panels, replant landscapes and re-use building materials to “minimize impact.” These changes essentially encourage developments that destroy less than traditional ones.

However, I contend that “destroying less” is still destroying, not enhancing. Yes, business-as-usual heavy touch developments are a problem, and the light touch developments are an improvement. However, even as more efficient houses and cars allow us to sustain our current system longer, they are ultimately still depleting natural resources. Like thrifty spenders on a shopping spree, these ‘more efficient’ products do deplete resources more slowly, but nonetheless still deplete – they spend from, rather than add to, ecosystem functioning. A new frame of Positive Human Action can challenge developers and planners to think even further, beyond LEED certification, to human societies that could actively *enhance* ecosystems; human developments that integrate and support local flora and fauna, rather than just “minimize impact.”

For instance, not all agriculture is bad for ecosystems. Yes, monoculture undermines biodiversity, but polyculture promotes biodiversity. Such developments and polyculture agriculture are promoted most famously by Vandana Shiva, drawing on traditional farming

practices in India, but there are models for this kind of positive human activity all over the world (Shiva 1998, 2000, Savory 1999, Guha 1989). It is precisely such human activities that need to be highlighted in the U.S. to demonstrate the value of human touch.

On the other extreme, one might worry that the Positive Human Action framing will be co-opted by those who promote the economic development frame. Removing the “Humans Always Cause Damage” frame and its “light touch” messaging might swing misunderstanding in a different, and more harmful direction: namely that all human touch is good for the environment. Although motivating, this message is false and could lead to much destruction. I agree that this is a concern. As we celebrate human activity, we must remember the caution from Hall (Hall 2013, 11). These human actions must always take us in the direction we are trying to go (mitigating climate change and enhancing ecosystems), rather than leading us toward more environmental degradation. Many who champion human activity as the solution to climate change focus on technological progress and economic growth (Norhaus and Shellenbger 2007), yet it is quite possible that their solutions, like geoengineering, could create more environmental problems than they solve (Gardiner 2011).

In a related concern, one might worry that the Positive Human Action framing will be co-opted by those who think there is no environmental crisis at all (Hayadisha 2005). One might use examples of humans positively changing their environment to argue that all human change is positive, and so we do not need to take steps to mitigate climate change. This argument would commit the same fallacy as the “Human Action Causes Damage” frame, namely focusing on one quality of a particular human activity and then generalizing to all human activities. The concern is that people will be convinced by the equally fallacious mirror image argument.

I agree this is also risk. To respond to both of the concerns, it is helpful to recall that, as Nisbet suggested and we have seen from the environmental psychology research, frames that emphasize human agency are the most motivating, especially when they are paired with a morality and ethics framing (Nisbet 2009, Steg, Bolderdijk, et al. 2014 p. 110, Bolderdijk, Lehman, et al., 2012; Bolderdijk, Steg, et al., 2012, Gifford and Comeau 2011). Right now, the Economic Development Frame is one of the few frames in public discourse that emphasizes human agency. And yet the human agency described there is likely to make the environmental problems worse by depleting even more natural resources and unbalancing existing eco system functioning. So we need a better alternative frame that also highlights human agency. A Positive Human Touch framing can do that. This new frame would not only show that human agency can solve the problems of Climate Change, but would also help us identify which actions are beneficial, and which are actually harmful. Like the pastry chef who pays attention to the dough and adjusts her touch in response to feedback from the dough, we must learn to attend to how our actions affect the environment, and then minimize the negative actions while also amplifying the positive actions.

The current framing around the environment is not working. In 2010, nearly 40% of U.S. citizens said the Environmental Movement had done more harm than good (Dunlap 2010).

Over the past decade, the number of Americans who support the environmental movement has declined, with supporters increasingly split along partisan lines. On the other hand, most Americans strongly support developing clean energy, believe that global warming is an important issue, and regularly engage in behaviors that are good for the environment. At least that's what we've told the researchers. (Curtis 2012).

Environmental values have stayed the same, but action has stalled. The Pew Research Center discovered that while Americans do care about environmental issues and global warming, when they were asked what should be a top priority for the President and Congress, global warming

ranked the lowest out of 21 other priorities. (Pew Research Center for the People & The Press, 2013)

People in the United States are ready for a new way to interact with the environment. But first they need a framework that makes space for human agency, and that allows them to embrace environmentalism without sacrificing their very selves.

Sacrifice, not deprivation

Hall's call to acknowledge real sacrifices is convincing. To mitigate Climate Change, we will definitely have to give things up – things that many of us care deeply about, including easy world travelling that connects us with family, friends, and work conferences; plentiful foods from around the world in any season; heating and air conditioning which provides the longed for warmth during winter and the needed cool in the summer; ease of travel by car in one's own community; cheap and plentiful computers and phones that we having been integrating ever more deeply into our daily lives.

Things like phones, cars, computers, airplanes (and the energy to run them) are no longer luxuries – they have become necessities that allow us to live where we want, to follow available jobs, and still stay connected to our communities. To lose these things, or similar things, will entail real sacrifice.

Yet, Hall highlights that “sacrifice” is exactly the right word because to lose things like this is not simply a deprivation. To “sacrifice” is not to just “go without” something, but to go without it in exchange for something even better. “There must be something of greater value to inspire the sacrifice in the first place” (Hall 2013 p. 13). As Catriona McKinnon comments on Hall, “Sacrifice is not synonymous with deprivation, and can have a positive impact on the life of

the one who makes the sacrifice, particularly when it is freely undertaken, genuinely necessary, and achieves a worthwhile purpose.” (McKinnon p. 43)

So to build on Hall’s conclusion, and to pair it with the arguments in this paper, this means we need to be clear in public discourse that sacrificing real human needs will bring us something even better. The “Humans Always Cause Damage” frame implies the false claim that “All humans are in competition with the ecosystem.” If humans and the environment were engaged in a zero-sum game, then the depravations needed to mitigate climate change would not be sacrifices at all, but simply concessions to the other side. These concessions would mean that humans would have to give things up to the environment, and get nothing good in return. Moreover, humans would be called upon to give up *themselves* and any hope for a good life. When seen this way, it is unsurprising that a call for “sacrifice” would be unpopular among those with human-centric, rather than biocentric, concerns (and research shows that it is: Schultz 2001, Steg et al. 2014, p. 111, de Groot & Steg 2010).

Moreover, Lori Gruen, William Johnston, and Clement Loo argue that when calling for sacrifice, we must emphasize not just the material gains, but the moral ones. They argue that sacrifice is more complicated than just giving up something in exchange for something better. Rather, the act of sacrifice itself has value. The story we tell ourselves about that sacrifice can make the sacrifice either more palatable, or unbearable; it can either bring together communities, or divide them. (Gruen et al. 2013)

This is supported by the empirical research, some of which we saw above (Steg et. al 2014). First, Steg et al. provide evidence that people are more willing to make sacrifices when the loss is given willingly, with an understanding of what it is for, and an agreement with that

goal. In addition, placing value on the sacrifice itself makes people more likely to comply with it. In particular, Steg et al. show that when the sacrifices are high, normative appeals are more effective than those that simply minimize the costs. However, they argue that both approaches are needed. Based on their surveys, they recommend: 1) Appeal to the ethics and morality of the situation (“Do the right thing. Recycle.”), and 2) Show that the potential gains are better than previously understood, and 3) Show that the losses are not as steep as previously understood (e.g. “Recycle. Curbside pick up makes it easy.”). Steg et. al compile extensive empirical research that demonstrates how these three techniques, when taken together, can be successful at motivating environmental action.

This means the “ethics and morality” frames mentioned by Nisbet have an important role to play. And a new framing that emphasizes Positive Human Action could help clarify the other two points: The costs are high, but not unbearable: you do not have to sacrifice yourself (literally) nor do you have to sacrifice what it means to be human. And the long-term benefits of a sustainable human/environment partnership are high; these benefits (such as clean air and water) far outweigh the very real freedoms and material goods that are lost (Maibach 2010).

If humans were framed as engaged in a zero-sum competition with nature, than one would not be able to appeal to frames of ethics and morality. Doing so would force individuals to betray their loyalty to humanity, which many people see as unethical. One would not be able to show that the gains are worth more than what is being given up, since one must give up everything important in exchange for nothing of value. Only when humans and the environment are framed as the intertwined systems that we are can the deprivations called for by Hall be acknowledged for what *they are*: achievable sacrifices in exchange for something better, namely a world in which both nature and humans thrive.

Conclusion

I speculate that environmental metaphors like “tread lightly” and “take only pictures, leave only footprints” can be interpreted by some as portraying all human action as harmful to the environment – sometimes as very harmful, other times as a little harmful. In doing so, these metaphors can lead to a “Humans Always Cause Damage” framing in which environmental problems are seen as the inevitable result of humans and the environment fighting over scarce resources in a zero-sum game. I have argued that, if so, such a framing forces a choice between loyalty to humanity or helping the environment. A more motivating frame would be a new frame of environmentalism that acknowledges the difference between *harmful* human action and *positive* human action. A frame that emphasizes Positive Human Action would allow the general public in rich countries to understand and accept environmental projects that require intense human intervention. But, more importantly, this frame would acknowledge that there is room for both a decent human life and a thriving ecosystem, and would not pit one against the other in a zero-sum game. This acknowledgement would allow people in rich countries to take the steps necessary to reduce climate change without feeling like they are sacrificing their own well-being or sense of self. It would allow them to believe that there is space for humans to not only exist, but also to live well.

This is the legacy of Arne Naess, Vandana Shiva, Juliet Schor and others: that we can increase our quality of life even while decreasing our standard of living. Hall reminds us that productive framing of climate change needs to be upfront about the sacrifices involved, and it is true that a less consumptive life will be different for many people and will require real sacrifices. But we must also sacrifice the right things, not people’s sense of humanity. The goal is to hold

onto what is truly important (community, beauty, health, human and animal life) not just what is superficially important or even extremely convenient. Reframing human touch as positive can make possible these much needed conversations about how humans can live sustainably and thrive at the same time. Instead of asking people to sacrifice loyalty to humanity, Positive Human Action framing can inspire us to be better humans.

References

Andreou, C. 2010. 'A shallow route to environmentally friendly happiness: Why evidence that we are shallow materialists need not be bad news for the environment(alist)'. *Ethics, Place & Environment: A Journal of Philosophy & Geography* 13:1–10.

Audubon Louisiana Nature Center, New Orleans. 2014. Common Ground Restoration Project.

Ausubel, Kenny. 2012. *Dreaming the Future: Reimagining Civilization in the Age of Nature*. Chelsea Green Publishing: Vermont.

Barker, Cathy. 2013 'U.S. stands out as among the least concerned about climate change'. *Pew Research Center*. <http://www.pewresearch.org/fact-tank/2013/09/27/u-s-stands-out-as-among-the-least-concerned-about-climate-change/>

Benammar, Karim and Noam Gressel "Forget Sustainability," THINK School of Creative Leaders. June 9 2015. <http://www.thnk.org/insights/go-for-green-entrepreneurship/> Accessed May 2016.

Bowden, M. J. 1992. 'The Invention of American Tradition'. *Journal of Historical Geography* 18: 3-26.

Booth, Kate. 2013. 'Deep Ecology, Hybrid Geographies, and Environmental Management's Relational Premise'. *Environmental Values* 22: 523-543.

Bolderdijk, J. W., Lehman, P. K., & Geller, E. S. (2012). Encouraging pro- environmental behaviour with rewards and penalties. In L. Steg, A. E. van den Berg, & J. I. M. de Groot (Eds.), *Environmental psychology: An introduction* (pp. 233e242). Oxford, UK: John Wiley & Sons.

Bolderdijk, J. W., Steg, L., Geller, E. S., Lehman, P. K., & Postmes, T. (2012). Comparing the effectiveness of monetary versus moral motives in environmental campaigning. *Nature Climate Change*, 3, 413e416. <http://dx.doi.org/10.1038/NCLIMATE1767>.

Callicott, Baird. 1995. 'A Critique of and an Alternative to the Wilderness Idea'. *Wild Earth* 4.

Cobb, Gina. 2008. 'Dr. Bell goes up to Bat'. *The Cutting Edge*. http://ginacobb.typepad.com/gina_cobb/2008/05/dr-ball-goes-to.html (accessed 20 March 2015).

Cronon, William. 1995. 'The Trouble with Wilderness'. *New York Times Sunday Magazine*: 42-43.

Curtis, Lisa. 2012. 'Don't Call Me an Environmentalist'. *Grist*. <http://grist.org/green-jobs/dont-call-me-an-environmentalist/> (accessed 20 March 2015).

Davis JL, Green JD, Reed A. 2009. 'Interdependence with the environment: commitment, interconnectedness, and environmental behavior.' *Journal of Environmental Psychology* 29:173–80.

de Groot JIM, Steg L. 2010. 'Relationship between value orientations, self-determined motivational types and pro-environmental behavioural intentions.' *Journal of Environmental Psychology*. 30:368–78

Denevan, William M. 1992. 'The Pristine Myth: The Landscape of the Americas in 1492'. *Annals of the Association of American Geographers* Washington, D.C.: Association of American Geographers 82: 369–385.

----- 2011. The "Pristine Myth" Revisited. *Geographical Review*, 101: 576-591.

Di Paola, Marcello. 2013. 'Environmental Stewardship, Moral Psychology and Gardens'. *Environmental Values* 22: 503-521.

Dunlap, Riley E. 2010. 'At 40, Environmental Movement Endures, With Less Consensus'. Gallup polling.

Dutcher DD, Finley JC, Luloff AE. 2007. 'Connectivity with nature as a measure of environmental values.' *Environmental Behavior*. 39:474–93.

Earth First! About page. <http://www.earthfirst.org/about.htm> (accessed August 3 2015).

Epstein, Alex. 2016. "Why Green Energy Means No Energy," *Forbes* March 2016. <http://www.forbes.com/sites/alexepstein/2016/03/28/why-green-energy-means-no-energy/2/#2049253a6a4c>

Ereaut, Gil & Segnit, Nat. 2006. Warm words: How are we telling the climate story and can we tell it better? London: Institute for Public Policy Research. Retrieved from www.ippr.org

Feinberg, M., & Willer, R. (2011). Apocalypse soon? *Psychological Science*, 22(1), 34–38.

Feygina, I. (2010). System justification, the denial of global warming, and the possibility of 'system-sanctioned change'. *Personality and Social Psychology Bulletin*, 36(3), 326–338.

Gardiner, Stephen. 2006. 'The Perfect Moral Storm'. *Environmental Values* 15:397-413.

----- . 2011. 'Some early ethics of geoengineering the climate: A commentary on the values of the Royal Society Report'. *Environmental Values* **20**: 163–188.

Gifford, Robert. 2014. 'Environmental Psychology Matters.' *Annual Review of Psychology*. 65:541-579. DOI: 10.1146/annurev-psych-010213-115048

Gifford, Robert, and Louise A. Comeau. 2011. 'Message framing influences perceived climate change competence, engagement, and behavioral intentions.' *Global Environmental Change* **21**: 1301-1307.

Gruen, Lori, William Johnston, and Clement Loo. 2013. 'Changing Values: a Commentary on Hall'. *Ethics, Policy & Environment*. DOI:10.1080/21550085.2013.801184

Guha, Ramachandra. 1989. 'Radical American Environmentalism and Wilderness Preservation: A Third World Critique'. *Environmental Values* **11**: 71-83.

Haigh, Martin. 2006. 'Deep Ecology Education: Learning from its Vaisnava Roots'. *Canadian Journal of Environmental Education*. **11**: 43-56.

Hall, Cheryl. 2013. 'What Will it Mean to be Green? Envisioning Positive Possibilities Without Dismissing Loss'. *Ethics, Policy & Environment*. DOI: 10.1080/21550085.2013.801182.

Hayashida, F. M. 2005. 'Archaeology, Ecological History, and Conservation'. *Annual Review of Anthropology* **34**:43-65. pg 57

Hern, Warren M. 1990. 'Why Are There So Many of Us? Description and Diagnosis of a Planetary Ecopathological Process'. *Population and Environment* **12**: 9-39.

Hull, R. Bruce. 2013. *Infinite Nature*. University of Chicago Press.

Knapp, Doug & Raymond Poff. 2001. "A Qualitative Analysis of the Immediate and Short-Term Impact of an Environmental Interpretive Program," *Environmental Education Research* 7:1 (55-65).

Knight, Les. 2001. The Voluntary Human Extinction Movement. <http://www.vhemt.org/>

Leopold, Aldo. 1949. *A Sand County Almanac and Sketches Here and There*. Oxford University Press: New York.

Lowenstein, Jerold M. 1992. 'Can We Wipe Out Disease'? *Discover* November 1992: 120-125.

The Luntz Research Companies. 2003. *Straight Talk*. A copy can be found at <https://www2.bc.edu/~plater/Newpublicsite06/suppmats/02.6.pdf> or https://niggaraths.files.wordpress.com/2013/03/luntzresearch_environment.pdf (accessed July 31, 2015)

Mabon, Leslie and Simon Shackley. 2015. 'Meeting the Targets or Re-Imagining Society? An Empirical Study into the Ethical Landscape of Carbon Dioxide Capture and Storage in Scotland'. *Environmental Values* **24**: 465-482.

Macdonald, Helen. 2015. *H is for Hawk*. Grove Press. p. 8.

Maibach, E., Nisbet, M., Baldwin, P., Akerlof, K., & Diao, G. 2010. 'Reframing climate change as a public health issue: An exploratory study of public reactions.' *BMC Public Health*.10(299): 1-11.

Mann, Charles. 2002. '1491'. *The Atlantic Monthly*. March.

Mayer, Stephen F. and Cynthia Frantz. 2004. 'The Connectedness to Nature Scale: A measure of individual's feeling in community with nature.' *Journal of Environmental Psychology*. **24**: 503-515. doi:10.1016/j.jenvp.2004.10.001

McDonough, William & Michael Braungart. 2002. *Cradle to Cradle: Remaking the way we Make Things*. North Point Press: NY.

McKinnon, Catriona. 2014. 'Climate Change: Against Despair'. *Ethics and the Environment* **19**: 31-48.

Meadows, Donella et al. 1972. *The Limits of Growth*. Universe Books.

Mohan, Geoffrey. 2015. 'Scientists Use Wasps to Protect Citrus Plants from Disease'. Los Angeles Times. August 14, 2015.

Moser, S. C. and L. Dilling. 2010. 'Communicating Climate Change: Opportunities and Challenges for Closing the Science-Action Gap.' In: *The Oxford Handbook of Climate Change and Society*, Richard Norgaard, David Schlosberg, John Dryzek eds.

Moser, S., & Dilling, L. 2004. 'Making climate hot: Communicating the urgency and challenge of global climate change'. *Environment: Science and Policy for Sustainable Development*, **46**(10), 32-46.

Moser, S., & Dilling, L. 2007. *Creating a climate for change: Communicating climate change and facilitating social change* (reissue). Cambridge, MA: Cambridge University Press.

Motel, Seth. 2014. 'Polls show most Americans believe in climate change, but give it a low priority'. *Pew Research Center*. <http://www.pewresearch.org/fact-tank/2014/09/23/most-americans-believe-in-climate-change-but-give-it-low-priority/>

Naess, Arne. 1973. 'The Shallow and the Deep, Long-Range Ecology Movement: A Summary'. *Inquiry* **16**: 95-100.

Nichols, W J., Anontio Resendiz, A. Jeffrey, Beatrice Resendiz. 2000. 'Transpacific migration of loggerhead turtle monitored by satellite telemetry'. *Bulletin of Marine Science* **67**: 937-947.

Nisbet, Matthew. 2009. 'Communicating climate change: Why frames matter for public engagement'. *Environment Magazine: Science and Policy for Sustainable Development*. Retrieved from <http://www.environmentmagazine.org/Archives/Back%20Issues/March-April%202009/Nisbet-full.html>

O'Neill, S., & Nicholson-Cole, S. (2009). 'Fear won't do it': Promoting positive engagement with climate change through visual and iconic representations. *Science Communication*, 30(3), 355–379.

Paine, Robert T. 1966. "Food Web Complexity and Species Diversity". *The American Naturalist* 100: 65–75. doi:10.1086/282400. JSTOR 2459379.

----- "A Note on Trophic Complexity and Community Stability". *The American Naturalist* 103: 91–93. doi:10.1086/282586. JSTOR 2459472.

Pew Research Center for the People & The Press. (2013). Deficit reduction rises on public's agenda for Obama's second term: Public's policy priorities: 1996–2013. Pew Research Center for the People & The Press. Retrieved from <http://www.people-press.org/2013/01/24/deficit-reduction-rises-on-publics-agenda-for-obamas-second-term/>

Plumwood, Val. 1991. 'Nature, Self, and Gender: Feminism, Environmental Philosophy, and the Critique of Rationalism'. *Hypatia* 6: 3-22.

Revkin, Andrew. 2007. 'Are words worthless in the climate fight?' Dot Earth, NYTimes.com. Retrieved from <http://dotearth.blogs.nytimes.com/2007/12/03/are-words-worthless-in-the-climate-fight/>

----- 2007b. 'Climate Change as News: Challenges in Communicating Environmental Science'. J. C. DiMento and P. M. Doughman, eds., *Climate Change: What It Means for Us, Our Children, and Our Grandchildren*. Boston, MA: MIT Press. 139–60.

Savoy, Allan and Jody Butterfield. 1999. *Holistic Management: A New Framework for Decision Making*. Island Press, Washington D.C.

Schor, J. B. 2010. *Plenitude: The new economics of true wealth*. New York: The Penguin Press.

Shellenberger, Michael, & Nordhaus, Ted. 2004. 'The death of environmentalism: Global warming politics in a post-environmental world'. Retrieved from www.thebreakthrough.org/PDF/Death_of_Environmentalism.pdf

Shellenberger, Michael & Nordhaus, Ted. 2007. Second life: A manifesto for a new environmentalism. *The New Republic*, 30–33.

Shiva, Vandana. 2004. Three principles to live by. In R. Prime (Ed.), *Vedic ecology: Practical wisdom for surviving the 21st century*. Novato, CA: Mandala. 132-134.

Shiva, Vandana. 2000. 'Stolen Harvest: Hijacking the Food supply'. South End Press, Cambridge, MA.

----- 1998. 'Monocultures, myths and the masculinisation of agriculture'. Statement in response to the International Conference on Women and Agriculture.

Schultz, P. Wesley. 2000. 'Empathizing with Nature: The Effects of Perspective Taking on Concern for Environmental Issues'. *Journal of Social Issues*. **56**: 391-406.

Schultz, P. Wesley. 2001. 'The Structure of Environmental Concern: Concern for Self, Other People, and the Biosphere'. *Journal of Environmental Psychology*. doi:10.1006/jevp.2001.0227

Shue, Henry. 1993. 'Subsistence Emissions and Luxury Emissions', *Law and Policy*. 15:39-59.

Smith, Wesley J. 2013. 'Save the Planet Kill Yourself! Environmentalists Want Humans to Live Shorter Lives'. *LifeNews.com* <http://www.lifeneews.com/2013/10/12/save-the-planet-kill-yourself-environmentalists-want-humans-to-live-shorter-lives/>

Steg, Linda, Jan Willem Bolderdijk, Kees Keizer, Goda Perlaviciute. 2014 'An Integrated Framework for Encouraging Pro-environmental Behaviour: The role of values, situational factors and goals.' *Journal of Environmental Psychology*. 38: 104-115.

Varner, Gary E. 1995. 'Can Animal Rights Activists Be Environmentalists?' in *Environmental Ethics* ed by Andrew Light and Holmes Rolston III. Blackwell Publishing, Malden, MA.

Vining, Joanne, Elizabeth Tyler, and Byoung-Suk Kweon. 2000. 'Public values, opinions, and emotions in restoration controversies' in *Restoring Nature* ed. Paul H. Gobster and R. Bruce Hull. Island Press, Washington D.C.

Waring, Richard H. and Steven W. Running. 2007. *Forestry Ecosystems: Analysis at Multiple Scales*. Elsevier Academic Press, London.

Weeks, Darren. 2007. 'Save the Planet – Kill Yourself?' *NewsWithViews.com* <http://www.newswithviews.com/Weeks/darren2.htm>

Welchman, Jennifer. 2012. 'A Defense of Environmental Stewardship'. *Environmental Values* 21: 297-316.

Wike, Richard. 2014. 'Many around the world see climate change as a major threat'. *Pew Research Center*. <http://www.pewresearch.org/fact-tank/2014/03/31/many-around-the-world-see-climate-change-as-a-major-threat/>