

# Essays in Philosophy

ISSN 1526-0569

Volume 18, Issue 1 (2017)

## Focus on Fish: A Call to Effective Altruists

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### Abstract

Effective altruists call us to apply evidence-based reasoning to maximize the effectiveness of charitable giving. In particular, effective altruists assess causes in terms of their scope, neglectedness, and tractability, and then recommend devoting resources to the cause that scores best on these criteria. So far, effective altruists concerned with animal suffering have seen these criteria as supporting interventions that improve the lives of layer hens, and they now seem to think that these criteria support directing efforts toward broilers. In this paper, however, we argue that the effective altruist framework commits animal advocates to focus at least as much attention—if not more—on fish.

Essays Philos (2017)18:1 | DOI: 10.7710/1526-0569.1567

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## 1. Introduction

According to one of its main proponents, effective altruism is “a philosophy and social movement which applies evidence and reason to working out the most effective ways to improve the world” (Singer, 2015, 4-5). There are, after all, many ways we might improve the world, and we have to make choices between them: donating to the local food bank vs. donating to UNICEF, or volunteering to help with a mayoral campaign vs. volunteering to help with a presidential one. Effective altruists call this *cause prioritization*, and they offer three criteria to help us choose how to invest our financial and temporal resources: scope, tractability, and neglectedness.

*Scope* concerns the size and severity of the problem that you’re trying to address. It’s bad that there are never enough napkins in the cafeteria; it’s also bad that many children die of preventable diseases in developing countries. The latter, however, is the problem with greater scope, as more people are affected more negatively by preventable death than are affected by preventable ketchup stains. *Tractability* has to do with the likelihood that your resources will make a difference to the problem. You can spend millions on cryogenic research without changing the likelihood of staving off anyone’s death. You can, by contrast, spend a few hundred dollars on malaria nets, which is very likely to push back the deaths of those who receive them. Finally, *neglectedness* pertains to the resources that are currently dedicated to the issue. Lots of people are aware of problems in their own towns, and gladly devote resources to addressing them. Relative to their size, those local problems probably aren’t neglected. But even if people know about the problems that are traceable to global poverty, they are much less inclined to devote resources to addressing them. Relative to *their* size, those problems are desperately neglected.<sup>1</sup>

An issue’s scope, tractability, and neglectedness aren’t fixed: successes in advocacy can reduce the scope of a problem, public attention can reduce its neglectedness, and new organizations can improve its tractability. So, effective altruists frequently evaluate whether their causes and strategies are still the right ones. Our goal here is to contribute to that project—not as effective altruists ourselves, but as supporters of their work on behalf of animals. In particular, we’re interested in the cause prioritization issue. Over the last several years, the effective altruists who have focused on animal suffering have prioritized layer hens, achieving some successes as a result, and are now considering adding broilers to their efforts. However, we think that the evidence supports focusing at least as much attention—if not more—on fish.

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<sup>1</sup> International aid makes up around 4% of charitable giving in the US. See <http://givingusa.org/giving-usa-2016/>.

We'll begin by summarizing the effective altruist argument for prioritizing chicken. Next, we'll dig into the numbers that support shifting attention toward fish. Finally, we'll consider some ways to resist this conclusion, and we'll argue that none succeeds.

## 2. Chickens

Not all effective altruists agree that we ought to prioritize harm to animals, but among those who do, there is general agreement that farmed animals take priority. Arguing that donors and volunteers should prioritize farmed animal welfare, Animal Charity Evaluators (ACE) juxtaposes the number of animals killed by humans on farms (high) compared to those killed by humans elsewhere (low) with the amount of money donated to farmed animal charities (low) relative to other animal charities (high). According to ACE (2016a), a majority of money donated to animal charities goes to shelters that care for companion animals.<sup>2</sup> Peter Singer (2015, 137) calculates that there are fifty-five times as many factory farmed animals in the United States than there are dogs and cats, and argues that most of those companion animals live reasonably good lives. Thus, as a simple matter of scope and neglectedness, farmed animals seem to rise to the highest level of priority for those who want to reduce animal suffering most effectively. Moreover, it can cost tens to hundreds of dollars to save a companion animal whereas a farmed animal can be saved at a fraction of that cost. Tractability, therefore, seems to support a focus on farmed animals.

Still, there are important variations of species and circumstance, raising questions about whether it's worth prioritizing some farmed animals over others. Here too there is general agreement: effective altruists have opted to focus on chickens. In 2015, the United States Department of Agriculture calculated that 9.2 billion farmed animals were slaughtered in the United States, 8.8 billion of whom were chickens (USDA, 2016a; 2016b). That means that about 95% of all farmed animals killed in the U.S. are chickens, making the scope of the problem incredibly high. However, effective altruists haven't been focusing on chickens generally. The majority of those chickens are broilers—i.e., chickens raised solely for consumption: they alone outnumber the members of any other terrestrial farmed species. But effective altruists have largely been attending to the remaining 300 million, which is composed of layer

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<sup>2</sup> See Ace (2016a): "Of animals used and killed by humans in the United States, over 99.6% are farmed animals, about 0.2% are animals used in laboratories, 0.07% are used for clothing, and 0.03% are killed in companion animal shelters. However, about 66% of donations to animal charities in the United States go to companion animal shelters, 32% go to groups with mixed or other activities, and just 0.8% of donations go specifically to farmed animal organizations, while 0.7% go to laboratory animal organizations."

hens. The movement has been lobbying corporations to transition from battery cages to cage-free operations, and many effective altruists see this as a highly tractable, impactful, and cost-effective way to (a) reduce suffering in the short-term and (b) begin the long-term project of reducing the number of chickens killed.<sup>3</sup> With some successes behind them, the movement sees broilers as its next task. Those 8.5 billion broilers are certainly a worthy cause.

Unfortunately, though, the USDA is one of many data sources that provide an incomplete picture of animals killed for food: it doesn't count fish. This failure has practical implications, in that it hinders the ability of animal advocates to see the broader picture of animal exploitation. For example, the Humane Society of the United States (HSUS), the largest national animal welfare advocacy organization, tabulates slaughter totals of farmed animals annually<sup>4</sup> to help guide decision making for effective farmed animal protection, and it uses the USDA's numbers. Unsurprisingly, then, its slaughter numbers are limited to terrestrial animals.<sup>5</sup> Why does this matter? To date, HSUS spends about three to four million dollars on farmed animal protection annually, almost none of which goes directly to fish protection. Granted, it tends to focus on one issue at a time, but that issue today is decidedly not fish. And HSUS isn't alone in this regard.

### 3. Fish

Fish have often been undervalued and overlooked by both animal advocates generally and the effective altruist community specifically. This may be because of skepticism about fish sentience. However, this skepticism flies in the face of a deep and expanding literature on the existence of vertebrate aquatic animal pain. As Sneddon (2015) writes:

Contemporary studies over the last 10 years have demonstrated that bony fish possess nociceptors that are similar to those in mammals; that they demonstrate pain-related changes in physiology and behavior that are reduced by painkillers; that they exhibit higher brain activity when painfully stimulated; and that pain is more important than showing fear or anti-predator behavior in bony fish. The neurophysiologi-

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<sup>3</sup> For detailed and articulate thinking on this strategy, see Bollard 2016.

<sup>4</sup> Accessible here: [http://www.humanesociety.org/news/resources/research/stats\\_slaughter\\_totals.html](http://www.humanesociety.org/news/resources/research/stats_slaughter_totals.html)

<sup>5</sup> To their credit, the HSUS notes that these slaughter totals do not include fish or other species for which the USDA does not provide information. However, the HSUS does not even attempt to tabulate numbers or direct readers to other sources with information on fish.

cal basis of nociception or pain in fish is demonstrably similar to that in mammals. (967)<sup>6</sup>

Granted, many believe that pain is only morally relevant when its felt, so we ought to prioritize animals that are not only capable of nociceptive responses but also capable of suffering (conscious pain). We can't make the case for fish consciousness here, but we follow Braithewaite (2010): she argues "that there is as much evidence that fish feel pain *and suffer* as there is for birds and mammals—and more than there is for human neonates and preterm babies" (153, *italics added*). So, we will largely ignore concerns about whether fish are sentient.<sup>7</sup>

Effective altruists highly value careful analysis and evidence-based decision making. Bringing fish to the fore can improve effective altruists' analyses. More importantly, it may help the immense number of fish killed annually for human ends. An effective altruist case for prioritizing fish considers the now-familiar criteria: scope, tractability, and neglectedness.

### 3.1 Scope

There is a huge barrier to meaningful conversation about the scope of harm to fish: namely, data. Unlike the number of chickens slaughtered in the U.S. annually, the number of fish killed annually can't be determined by reading a single line in any report by the USDA or the Food and Agriculture Organization of the United Nations (FAO).<sup>8</sup> The story of fish use and abuse for human consumption turns out to be much more complex, with the data often hard to find and even harder to interpret.<sup>9</sup> You need a lot of different numbers to generate the full picture about fish for the U.S. market, and each one is hard to estimate. What's more, some are simply unavailable. However, the essentials are available, and in what follows we'll put them together. Although the resulting picture may not

<sup>6</sup> See too the forty-plus responses to Key (2016), almost none of which agree with Key's skeptical conclusion.

<sup>7</sup> For detailed treatments of this debate, see Balcombe (2016); Sneddon (2015); Elder (2014); Brown (2014); Broom (2007; 2014); and Lund et al. (2007).

<sup>8</sup> Granted, the number of fish killed isn't all that matters: we also need to consider how much fish suffer. We'll discuss that issue later.

<sup>9</sup> To justify prioritizing a particular species, we need to consult the data on all species killed, and of course that data needs to be reliable. If nothing else, effective altruists ought to focus on research prioritization: we need better data on the scope of fish suffering and death if we're to follow their own decision procedures.

be as clear as we'd like it to be, it is, we submit, good enough for present purposes. Unlike terrestrial animal agriculture, the FAO measures fisheries and aquaculture production in tonnage as opposed to individual heads.<sup>10</sup> Thus, the number of individual aquatic animals can only be estimated by dividing the tonnage of each species by the mean weights of those animals. The estimated total number of individual fish killed is only the tip of the iceberg; many more animals are killed in the process of getting seafood on our plates than those who end up on them. Estimates are made especially difficult by three phenomena: bycatch, fishmeal, and illegal, unreported, and unregulated fishing.<sup>11</sup>

Bycatch, or the incidental and discarded capture of non-target animals during fishing, is an inherent feature of wild-caught fisheries. Survival rates for bycatch vary, but are generally low for all species. Bycatch numbers are often undocumented, making them difficult to monitor. In 2005, for example, less than half of the world's fishing records quantitatively documented bycatch numbers (Read et al., 2005). Even the documented numbers are often limited, unreliable, and inconsistent: "only four out of hundreds of U.S. fisheries are meeting the recommended standards for the statistical accuracy and validity of their catch data, if they report at all" (Keledjian, 2014, 12-13). Even if fisheries adhere to the necessary standards, various researchers use differing definitions of bycatch. Frankly, comparisons are difficult.

Furthermore, if you want to limit the scope of bycatch data to U.S. food consumption only, which seems to be necessary if you want to limit the scope of fish harm to U.S. diets, bycatch from exported aquatic animals should be excluded and bycatch from imported aquatic animals should be included. No monitoring agency or research organization looks at consumption and bycatch in this way.

Research does, however, look at both global and domestic bycatch rates. Keledjian (2014) calculates that between 17–22% of wild-caught fish in U.S. fisheries are discarded. Davies et al. (2009) has calculations that are less conservative, finding that over 40% of the world's marine catch is bycatch. Many bycatch definitions do not include discards, which are fish that are either dead or dying and are thrown overboard (they can

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<sup>10</sup> We often use "fish" as a mass noun as opposed to a count noun, which has practical implications for understanding the true number of fish killed. Worse, though, it may have deeper implications for the way fish are objectified as an undifferentiated and otherwise de-individualized mass of protein. However, we'll follow the unfortunate convention here.

<sup>11</sup> In addition to these three difficulties, independent research has discovered catch trajectories differing quite considerably from the national data submitted to the FAO (Pauly & Zeller, 2016).

be target or non-target species). Globally, the FAO finds that about 8% of the total catch of sea animals in marine fisheries are discarded dead (Kelleher, 2005).

In addition to bycatch, there is a phenomenon unique to fish farming that further complicates the scope: we feed fish to the fish we farm. These fish are wild-caught and are fed to farmed fish in the form of fish meal and fish oil. No matter how the scope of fish use is measured, we ought to include fish used as fish food. Thirteen percent of world fish production is not consumed directly, and 76% of that excess is turned into fishmeal or fish oil (the rest of which is used in many ways, including direct feed for aquaculture) (FAO 2016). Although the industry is actively searching for innovative ways of decreasing the reliance on fishmeal, global aquaculture production has grown faster for fed species than for non-fed species.

Finally, illegal, unreported, and unregulated fishing (IUU) exacerbates the overexploitation of wild fish stocks. It's also extremely hard to monitor in the open oceans. Some estimate that the total value of current IUU fishing losses worldwide is between \$10 and \$23.5 billion annually, representing between 11 and 26 million tons of fish (Agnew, 2009). The FAO (2016) states that if IUU fishing is indeed 26 million tons of fish a year, that represents more than 15% of the world's total fisheries output.

The effective altruist meta-charity Animal Charity Evaluators (ACE) calculates that the number of aquatic animals killed annually for food in the U.S. is between 232-265 per capita.<sup>12</sup> In total numbers, that amounts to 72.3-82.6 billion aquatic animals.<sup>13</sup> However, one of the main shortcomings of ACE's analysis is that it doesn't include bycatch. If you incorporate the midpoint of Keledjian's (2014) U.S. fisheries bycatch percentage (19.5%), ACE's estimates grow to 75.1-87.4 billion aquatic animals.<sup>14</sup> If you use a less conservative estimate of bycatch, like the Davies et al. (2009) 40% calculation, then ACE's estimates grow to 78-92.4 billion.<sup>15</sup> Compared to chicken, these numbers suggest that anywhere between 8.5 to 10.5 times as many aquatic animals are killed annually for

<sup>12</sup> <http://www.animalcharityevaluators.org/research/foundational-research/fish-number-calculations/>

<sup>13</sup> ACE only calculates per capita numbers, so the total number of animals killed is calculated by multiplying ACE's range by the U.S. population in the year ACE's data was collected (2011; 311,591,917 according to the U.S. Census).

<sup>14</sup> Bycatch rates were not applied to shellfish in these calculations.

<sup>15</sup> Since the U.S. imports over 90% of its seafood, it seems safe to lean more toward global bycatch ratios in trying to reach the most accurate number here (as opposed to using bycatch rates for U.S. fisheries). For a discussion of seafood imports in the U.S., see Greenberg 2015.



U.S. consumption. Despite ACE's own number crunching, ACE states on their website<sup>16</sup> that they use a different analysis to inform their evaluation efforts: namely, those of Harish Sethu (whose blog is praised by Peter Singer as his "favorite example of the combination of effective altruism and numeracy" (2015, 89)).

Sethu (2015a) estimates that the total number of animals killed annually for direct and indirect consumption by the average American is 467.5. Of those, only 5.3% are land animals; the other 94.7% are aquatic animals (either finfishes consumed, shellfish consumed, fish meal, or bycatch<sup>17</sup>). This means that U.S. food consumption contributes to the death of somewhere between 106.9-172 billion aquatic animals annually. Chickens account for about 95% of all terrestrial animals killed for food annually. Aquatic animals account for about 95% of all animals killed for food annually. There is parity here in terms of scope: chickens are to land animals consumed as aquatic animals are to all animals consumed. According to Sethu's calculations, we kill, directly or indirectly, between twelve to over nineteen times more aquatic animals than chickens per year for food.<sup>18</sup>

The numbers presented so far from both ACE and Sethu include a broad range of aquatic animals: e.g., finfish like salmon, tuna, and catfish, as well as other sea animals like crabs, shrimp, lobsters, and oysters. Many effective altruists are less concerned about shellfish than finfish as they are more skeptical of the former's ability to suffer. So, those effective altruists might want to adjust Sethu's estimate downward.

To address these skeptics, we can break up ACE's conservative calculations between fish and other aquatic animals like shellfish. ACE calculates that 46-79 fish are killed per capita for American consumption every year. That amounts to somewhere between 14.3-24.6 billion fish killed. Depending on the bycatch ratios assumed, the numbers grow to 17.1-29.4 billion (19.5% midpoint bycatch rate from Keledjian 2014) or 20-34.4 billion (40% bycatch from Davies et al. 2009) fish. So even using these adjusted estimates from ACE, the number of fish killed annually range between *two to four times* the number of chickens. Sethu's more nuanced calculations can be adjusted to exclude shellfish killed for human consumption. If shellfish numbers are removed

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<sup>16</sup> <http://www.animalcharityevaluators.org/blog/how-many-animals-does-a-vegetarian-save-in-the-uk/>

<sup>17</sup> Bycatch is not exclusive to non-target aquatic animals; as many as 320,000 seabirds such as albatrosses, petrels, and shearwaters around the world are killed annually by longline fishing alone (Anderson et al., 2011).

<sup>18</sup> We should note that Sethu's numbers exclude all IUU fishing, which is, by its very nature, incredibly hard to count. Still, IUU fish are nevertheless part of the global fish supply.



and all else remains the same, Sethu's numbers can be amended to 63.8-128.9 billion animals annually.<sup>19</sup> This is seven to over fourteen times the number of chickens.

Our notion of scope ought to go beyond simply the numbers killed annually in the United States; additionally, we ought to account for larger industry trends. If there is good reason to believe that the status quo will be different tomorrow, then such considerations ought to inform our actions today. Not only does the snapshot of fish harm look bad presently, all the trends lead us to believe that fish suffering, both farmed and wild, will look even worse in the future.

Fish supply and fish demand are both increasing. Over the past fifty years, world fish supply for consumption has grown at a rate faster than population growth (3.2% versus 1.6%, respectively), causing per capita availability to increase considerably (FAO, 2016). Wild stocks are dwindling, but the aquaculture industry is more than happy to overcompensate, making it the fastest growing food production system in the world. The FOA projects that aquaculture will produce 57% of the global fish supply for human consumption by 2025, and that will only grow in the future. This is bad news for fish in two distinct ways: not only will more fish be killed, but also an increasing percentage will be farmed.

The increased availability of aquatic animals has translated to an increased trend in consumption; per capita fish consumption globally has grown from an average of 9.9 kg in the 1960s to 19.7 kg in 2013, with estimates for 2015 exceeding 20 kg (FAO, 2016). This is partly due to government support: the most recent United States dietary guidelines, for example, state that “shifts are needed within the protein foods group to increase seafood intake” and that Americans need to vary their protein sources by “incorporating seafood as the protein foods choice in meals twice per week in place of meat, poultry, or eggs” (USDA, 2015).<sup>20</sup> Based on these trends, Tilman and Clark (2014) predict that the 2050 global-average per capita income-dependent diet will have 82% more fish and seafood. The upshot: things are bad, and they're going to get much worse.

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<sup>19</sup> These numbers were derived from taking Sethu's total (106.9 – 172.03 billion aquatic animals) and subtracting shellfish (43.109 billion). The bycatch and fish meal numbers were left unchanged. In reality, bycatch numbers would change given that some bycatch (regardless of whether the target species is either fish or shellfish) is not fish.

<sup>20</sup> An early draft of the dietary guideline update included a suggestion for all Americans to reduce red meat consumption, which was greatly applauded by the animal welfare community. That recommendation was ultimately dropped from the final guidelines, and instead the USDA promotes shifting protein consumption to fish, which will likely affect many more animals than the “reduce red meat consumption” recommendation.

Given the calculations done by both ACE and Sethu, and considering the trends that suggest fish consumption and farming will both increase in the future, we can safely say this: whatever conclusions we reach about fish, they can be based off the assumption that the number of fish deaths is *at least five times* the number of chicken deaths annually. What's more, the number of fish deaths will only increase. Remember, these numbers are *just* finfish—not shrimp, crustaceans, or other species about which some may have higher doubt about their capacity to suffer. If we include all aquatic animals, the numbers double or quadruple: compared to chickens, somewhere between *ten to nineteen times* as many aquatic animals are killed annually for U.S. consumption.

### 3.2 Neglectedness

These numbers are startling. Perhaps more startling is how neglected fish are by the animal welfare world. Neglectedness seems to be the easiest of these criteria to prove, as there is not much of a debate about how many resources are currently dedicated to fish protection. Therefore, we won't spend much time making the case.

The Humane Society of the United States has already been mentioned as an organization that does not focus on fish welfare. The HSUS is by no means alone. All corporate outreach campaigns by organizations like the HSUS, The Humane League, Mercy for Animals, and many others have focused almost exclusively on laying hens and will likely move to broiler chickens in the near future.

The Global Animal Partnership (GAP) is a non-profit alliance of producers, retailers, animal advocates and scientists that is dedicated to improving farmed animal welfare through their 5-Step Animal Welfare Rating Program. The standards they've developed address seven types of land animals slaughtered for food, but they're silent when it comes to fish. The GAP even has welfare guidelines for Bison, only 121,500 of which were killed in 2015 (USDA, 2016, 15).<sup>21</sup>

We've already discussed ACE as a so-called meta-charity: i.e., a charity that evaluates other charities on effectiveness in order to help direct funding. ACE (2016b) published a blog post entitled "Charities we'd like to see" in which a staff member states that "fish welfare is generally neglected by animal advocates." This ought to be particularly tell-

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<sup>21</sup> We should note that some effective altruist organizations do indeed attempt to reduce fish suffering by advocating vegan diets. Vegan advocacy by organizations like The Humane League, Vegan Outreach, Mercy for Animals, FARM, and Animal Equality are some examples of such efforts that ostensibly help fish. However, as we argue later, we doubt that this suffices.

ing as an example of neglect across the animal welfare world, as ACE's role as a meta-charity is to evaluate the space as a whole. At the time of writing this, there is not one effective altruist animal organization that has a program dedicated specifically to fish protection.

### 3.3. *Tractability*

Are there any good arguments against prioritizing fish? One concern is tractability. Because fish are so neglected, there are few organizations that are working on their behalf, and even fewer that can document their activities in the ways required to be judged effective by the lights of effective altruist evaluators. So if you want to alleviate the plight of aquatic animals through charitable donations, it isn't clear where your dollars should go.

Moreover, there is a genuine hurdle to advancing the cause of fish by either (a) changing the priorities of current organizations or (b) starting new ones: namely, that people are less troubled by harm to fish than they are by harm to land animals. There are a variety of reasons for this. First, fish aren't morphologically similar to humans, and so people are disinclined to believe that they can suffer as much as land animals (if people believe that they suffer at all). (See Kasperbauer (2016) for an overview of a number of studies to this effect.) Second, they aren't cute, and so don't benefit from the affect-driven mechanisms behind our moral judgments. (See Dunn 2000, Sherman and Haidt 2011, and Estren 2012 for discussions of the relationship between empathy, pro-social attitudes, and cuteness.) Finally, it's possible to take moral cover under the thought that fishing is akin to hunting wild land animals, where the lives of fish are good on balance, and "death is just one day."

So the tractability problem is real. But before we can assess whether it can justify ignoring fish, we need to consider how we should balance the criteria.

One natural thought is that we should give the criteria equal weight. We've already discussed the neglectedness of fish, and it looks like the scope of the problem is enormous. After all, by the lights of ACE's conservative estimate, fish are killed at least twice the rate of chickens, and it's clear that they're neglected relative to chickens. A still-conservative, but more realistic estimate involves fish being killed at five times the rate of chickens, and if we include all aquatic animals it increases to between ten and nineteen times.

Moreover, it's important to realize that, according to the most recent data, 89.5% of

wild fish stocks are either fully exploited or overexploited, resulting in collapsing fish stocks and no real possibility of increasing wild-caught fish consumption (FAO, 2016). The natural limits of wild stocks are driving the unprecedented growth of aquaculture. As the FAO puts it:

In the last two decades, dramatic growth in aquaculture production has boosted average consumption of fish and fishery products at the global level. The shift towards relatively greater consumption of farmed species compared with wild fish reached a milestone in 2014, when the farmed sector's contribution to the supply of fish for human consumption surpassed that of wild-caught fish for the first time (2016, 76).

However, that means that fish reduction efforts needn't be directed toward wild-caught fish, as that industry is going to reduce its kill count for independent reasons. Instead, efforts can be directed toward farmed fish, which are the ones least well off. Moreover, those efforts need to be directed toward farmed fish, which—as we discussed earlier—are going to be farmed at much greater rates in the coming years.

We began this section with the thought that we should give the three EA criteria equal weight. Fish are indeed neglected, and since we are skeptical of dismissing fish by saying that while the kill-rate is higher, they suffer less overall, it looks like fish trump chicken when it comes to scope.

What does that mean? Well, consider how Singer (2015) discusses the problem of climate change:

It is almost certainly too late to stop or reverse climate change, at least without the use of risky geoengineering techniques. On the other hand, slowing climate change would be a very important goal, one that would bring huge benefits to the global poor and to all future generations. Whether we should support charities seeking to do that will depend on our estimate of the probability that our contribution will affect the ultimate outcome [i.e. tractability]. Because the outcome is so critical [i.e. scope], an action that has only a tiny chance of changing that outcome can still have very high expected value. So if one can reasonably believe that this tiny chance exists, then this does seem to be a worthwhile cause (145).

There may only be a small chance of making a difference for fish, but the scope is indeed enormous. So even if the issue isn't particularly tractable, fish ought to be prioritized.

## 4. Objections

Let's consider two objections to our analysis: one about the farmed / wild-caught distinction, the other about how you ought to weight the criteria.

### 4.1 *Farmed vs. Wild-Caught*

The first objection goes as follows. Farmed animals lead lives that are generally miserable, while wild-caught animals generally lead autonomous and decent lives until their unfortunate end. Moreover, if farmed animals aren't farmed, they just don't exist, whereas if wild-caught animals aren't caught, they just die in a different way a bit later. So, you might think that we shouldn't worry much about the wild-caught ones: overall, their lives aren't bad, and their deaths aren't significantly worse than they would be otherwise. But most fish are wild-caught rather than farmed. Once we restrict our attention to farmed fish, it's plain there is less suffering in aquaculture than there is in the chicken industry, and thus it's appropriate to prioritize chickens instead.

For the sake of argument, let's suppose that we should only consider farmed fish. Of the 45 billion fish killed each year for U.S. consumption, only a small percentage are consumed directly: Sethu (2015b) estimates 3.8 billion.<sup>22</sup> Just over half of that number represents farmed fish.<sup>23</sup> Now, the lives of these 1.9 billion fish are poor in many of the same ways that chickens lives are poor: they're crowded into pens, which creates stress, limits species-specific behaviors, and makes them vulnerable to outbreaks of disease; moreover, like chickens, they are excluded from the Humane Slaughter Act, which means that their deaths may often be slow and painful.

The horrors of aquaculture aren't as well-known as those of terrestrial factory farming, but they are real nevertheless. We can't review every relevant welfare problem here, so we'll limit ourselves to two notable examples. First, recent research has found that the prevalence of deformities in the ears of farmed fish is ten times higher than wild fish, regardless of species, which means that over half of all farmed fish may be deaf (Re-

<sup>22</sup> ACE puts the number between 675 million and 1.16 billion, but given the now-familiar shortcomings to ACE's data we will move forward with Sethu's numbers for the sake of this objection.

<sup>23</sup> Most aren't farmed in the U.S.: we import over 90% of our seafood. NOAA calculates that about half of all seafood imports are farmed. If we assume that the remaining ~10% of seafood that the U.S. does not import holds the same ratio of farmed to wild-caught (50/50), then Sethu's estimates get us 1.9 billion farmed fish. NOAA's data come from FishWatch, an organization run by NOAA Fisheries, available here: <http://www.fishwatch.gov/sustainable-seafood/the-global-picture>

imer et al., 2016). These deformities not only affect hearing, but also proprioceptive functions such as maintaining balance and sensing movement of one's own body. The deformities are present in young fish and are exacerbated as the fish get older. Vindas et al. (2016) has documented the prevalence of depression in growth stunted farmed salmon, who are so severely depressed in their situations that they die and float to the top of their tanks. These so-called 'drop-outs' appear to be depressed beyond toleration and some have suggested that they are, in effect, committing suicide. Second, sea lice plague the lives of many farmed fish, especially salmon (Torrissen, 2013). These lice can eat a considerable amount of a fish before killing it. In fact, they expose the skulls of fish often enough that the aquaculture industry has a term for this phenomenon: "the death crown."

Granted, there are differences between fish and chickens: thanks to selective breeding, chickens reach slaughter weight very quickly, and so are vulnerable to various problems that rapid growth creates, such as legs that aren't strong enough to hold their bodies. However, the same selective breeding techniques are already being applied to fish, and they'll be used more aggressively as aquaculture ramps up. AquaBounty AquAdvantage salmon have been approved by the FDA for human consumption and are genetically engineered salmon who grow at twice the rate of their non-engineered counterparts. Plainly, this won't create the same welfare problems that it does in chickens, but it may well create others. So, although we think that prioritizing fish makes sense on independent grounds, it's also important as a way of preventing problems that are likely to afflict fish in the coming years.

Still, we're only talking about 1.9 billion, which is a far cry from the 8.8 billion chickens killed each year. That said, we need to keep two points in mind. First, fish live much longer than do most chickens. In 2015, the average market age for a U.S. broiler chicken was just shy of 7 weeks (National Chicken Council, 2015), whereas tilapia—which are considered a fast-growing, efficient fish—tend to reach slaughter weight around 36 weeks (Bhujel 2014, 154). By contrast, various species of salmon are matured for at least a year (Asche and Bjørndal 2011, 7-16), and carp—which are by far the most common farmed fish, with the FAO estimating that they make up 62% of world production—take two years to reach slaughter weight. Nevertheless, let's assume a low average across fish species—say, one year.

The second point to keep in mind is that laying hens aren't relevant to our calculations here, given the cause prioritization issue at hand. (Although broiler chickens vastly outnumber layers—of the 8.8 billion chickens killed each year, about 8.5 billion are broilers—layers live much longer, with an average lifespan of 72 weeks.) With that in



mind, let's assume that fish and broiler chickens suffer equally. Given as much, the way to estimate total suffering is to calculate the number of life years represented by the broiler chicken industry and aquaculture. This gives us .978 billion life years of suffering for broilers and 1.9 billion life years of suffering in aquaculture.<sup>24</sup> The choice seems to be clear.

Someone might reject the assumption on which this calculation is based—namely, that fish and broilers suffer equally. But that's not a problem for our argument: even if fish suffer only two-thirds as much as broilers do, fish still edge out broilers in terms of life years of suffering: 1.27 billion vs. .978 billion. Moreover, it's extremely difficult, if not impossible, to do cross-species comparisons of suffering, especially if the goal is to make them precise enough for expected utility arguments. Hence, it makes sense to assume parity in intensive animal agriculture unless the evidence strongly indicates otherwise. And we don't think it strongly indicates otherwise.

Still, let's suppose that someone discounts fish suffering by even more, maintaining that fish suffer only 1/3 as much as broilers. (The reason doesn't matter: perhaps she doesn't think that fish have the same capacity to suffer, or perhaps she thinks that their living conditions aren't as bad, or perhaps she thinks both.) But now recall that we've been conservative with the numbers. For the sake of argument, we've simply ignored the suffering of wild-caught fish.<sup>25</sup> We've assumed a low average lifespan across fish species—only one year—whereas 18 months is still conservative but much more realistic. And perhaps worst of all, we've ignored the trend lines. The fishing industry has plateaued

<sup>24</sup> To get these numbers: (8.5 billion broilers \* 48 days) / 365 days) vs. (1.9 billion fish \* 365 days) / 365 days.

<sup>25</sup> We've ignored both wild-caught fish for human consumption and the wild-caught fish that we feed to the fish we farm. It's no easy task to isolate the total number of wild-caught aquatic animals killed to feed the aquacultured animals that Americans consume. Once again, Sethu (2015b) has attempted to unearth these numbers. He found that the number of wild sea animals captured and killed to feed the aquacultured animals eaten in the U.S. is between 144 and 293 per year, which amounts to somewhere between 45.3-92.3 billion aquatic animals. Granted, the aquatic animals killed and fed to aquacultured animals are not all fish, so we can limit these numbers further for those qualms about whether, e.g., shrimp can feel pain. To resolve this issue, we can remove both Antarctic krill (15.5%) and the 'other' category of Sethu's analysis (21.9%). This leaves 28.4-57.8 billion anchovies, herrings, capelins, sardines, pilchards, and mackerels. (These numbers alone are about three to seven times as many chicken killed annually, and these are just the fish we kill to feed the fish we eat.) Granted, these animals don't suffer for their entire lives. They often do, however, suffer for extended periods of time before dying. If we suppose that, on average, they suffer for an hour before dying, that adds another 3.2 million life years of suffering. (And, of course, this calculation ignores the impact of fishing on the remaining fish in the sea, some of which will starve as a result of reduced fish stocks, which takes far longer whom an hour.)



in some areas and is declining in others; aquaculture, on the other hand, is booming: it's growing at a rate of 3.2% per year (FAO, 2016), whereas the chicken industry is growing at rate closer to population growth—i.e., 1.6% per year.<sup>26</sup> We shouldn't ignore the value of intervening in aquaculture while the industry is relatively young: it's still possible to shape the way that aquaculture develops in the U.S. In the case of the chicken industry, by contrast, the goal is to fix—and, ultimately, dismantle—an established system. After all, let's suppose these trends continue, let's keep bracketing wild-caught fish, and let's adjust the average fish lifespan to a more realistic 18 months. By 2050, then, we can predict that aquaculture supporting the U.S. market will produce 1.48 billion years of suffering; the U.S. chicken industry, 1.39 billion life years. This is a tragic “win” for fish, albeit not the dramatic one you get when you focus on slaughter numbers, or when you don't discount fish suffering. Even with these restrictions, fish will experience an additional *90 million life years* of suffering.

#### 4.2 Weighting the Criteria

Here's a different sort of objection. Giving the criteria equal weights seems to support prioritizing fish. But perhaps the equal weight view is the wrong one. Might some other ranking deliver a different verdict? Scope first won't do it: as we've argued, death in the fish industry dwarfs the death in the chicken industry. It also won't do to rank neglectedness first. Not only are fish neglected relative to land animals, but the proposal doesn't fit with the spirit of the effective altruist movement. Lots of local needs score high on neglectedness and tractability, but low on scope—e.g., cleaning up trash alongside highways. If two of the three criteria support local causes, and one of those two is the most important of all the criteria, then you'd expect effective altruist assessments to support local causes. But they don't: the effective altruist movement certainly isn't known for the view that we should focus on the near and dear.

So, to argue against the effective altruist case for prioritizing fish, tractability of some other animal (e.g. chicken) would need to come first. (We'll take up the question of whether tractability actually supports prioritizing land animals over fish soon. For now, though, let's just assume that it does.) Plainly, though, it would be a mistake to think of tractability this way. First, it falls prey to the objection just discussed, which is that if tractability deserves extra weight, we'd expect effective altruists to focus on local issues, which are often far more tractable. But they don't. Second, it ignores the consideration given by Singer in the passage quoted earlier: to emphasize tractability

<sup>26</sup> <http://www.thepoultrysite.com/articles/3324/global-poultry-trends-2014-growth-in-chicken-consumption-in-americas-slows/>

would be to ignore potential long-term gains on a major issue—gains that can only be achieved by devoting resources to projects that are currently low on tractability. If we aren't going to give the criteria equal weight, and we still want to find a special role for tractability, then the next best way to understand it is as a sort of defeater condition: the thought is that we should prioritize causes that score high on scope and neglectedness *unless* they're so intractable that we would be throwing away our money. To see this, consider how MacAskill (2015) introduces the notion of tractability:

Even if a problem is hugely important and highly neglected, that doesn't mean it's an important cause to focus on. There might simply be very little we can do about it. For example, aging is a problem that is huge in scale: almost two-thirds of global ill health is a result of aging. It's a problem that's highly neglected: there are only a tiny number of research institutes focused on trying to prevent the causes of aging (rather than to treat its symptoms, like cancer, stroke, Alzheimer's, and so on). *However, the reason it's neglected is because many scientists believe it to be highly intractable. Preventing the aging process is just a very difficult problem to solve* (182, emphasis added).

The message here seems to be that *if* human aging were at all tractable, it would be very highly prioritized. Since it isn't, it won't be. Again, then, if we aren't inclined to give the criteria weight, we might read this passage as suggesting that tractability has a veto role, properly entering into the discussion only after scope and neglectedness have been considered.

Suppose so. In that case, the pressing question is how the cause of fish compares to the cause of chickens. But even if tractability breaks in favor of prioritizing chickens over fish, that doesn't settle the matter in favor of chickens. This is because, due to the scope and neglectedness differences, chickens would have to be *much more* tractable than fish. So if, for example, we were just to focus on kill numbers, then chickens would have to be *at least five times more tractable* than fish. Alternately, if we focus on life years of suffering (and don't discount fish suffering), then broilers would have to be at least *twice* as tractable. As far as we can see, there isn't a good reason to believe such bold claims about our ability to make progress on fish versus chickens. So, even if tractability functions as a veto criterion, it probably doesn't favor vetoing fish.

This brings us to a hard question: how tractable *is* the cause of fish? That, of course, is difficult to quantify, and we aren't in a position to engage in a serious assessment. Here, then, we'll have to be content with three points. First, and to our knowledge, effective altruists have yet to clarify why fish are so much *less* tractable than other causes

that tractability alone would swamp scope and neglectedness. So, the burden is on them.

Second, it's important to recall that effective altruists often think of tractability in terms of whether there are already organizations devoted to the cause that are having measurable successes. But insofar as there's been relatively little energy devoted toward fish, this stacks the deck against judging that the issue is indeed tractable. Insofar as fish *seem* to be less tractable than chickens, it's partly because animal organizations are focusing on land animals. If effective altruists change their messaging, they may well change the tractability of fish. In fact, fish may be today where chickens were twenty-five years ago; very few people saw chicken suffering as a tractable issue, but today animal activists of the effective altruist ilk are overwhelmingly focused on chickens and it's clear that the tractability of the problem has shifted.

The third point here is that there is reason to believe fish are indeed quite tractable. The European Food Safety Authority has both a position on fish sentience and fish welfare standards (ESFA, 2009), and the RSPCA has done considerable work both assessing fish welfare standards and increasing awareness of fish welfare issues by engaging the aquaculture industry. Finally, aquaculture presents us with a unique opportunity to intervene as it hasn't reached the globally established status of terrestrial farmed animal agriculture. An intervention in the nascent stages of aquaculture has the potential to be incredibly impactful, which supports the tractability of fish welfare.

This second point is particularly important when we consider how people are reacting to the work of animal activists. Some, of course, are willing to make wholesale change. But for many people, if arguments for veganism make any impact at all, it's by encouraging people either to scale back their meat consumption or to switch to "better" meat. And either way, that often means eating fish, which many people still don't think of as meat, and which people often see as involving less harm than farming land animals (whether because they have a dim view of the cognitive capacities of fish, or because they're uninformed about how fish suffer in the various ways that their bodies are secured for consumption). So, if effective altruists don't counteract the narrative that says that eating fish is better than eating chicken, pork, or beef, they may well be promoting fish consumption without realizing it. In other words, the flow-through effects of pro-vegan arguments probably aren't arguments that make fish better off.

This conclusion fits with the following considerations: (a) beef and pork consump-

tion is declining or leveling off while chicken and fish consumption is increasing,<sup>27</sup> (c) there is evidence that consumers are aware about welfare issues in land animal agriculture,<sup>28</sup> (d) there is evidence that consumers aren't aware about welfare issues in aquaculture and fishing (Honkanen and Olsen 2009), and (e) there is evidence that vegan leafletting is less effective when it comes to fish.<sup>29</sup> Of course, it's all but certain that retail price and health concerns are the major drivers in the dietary trends just mentioned, but since consumers tend to assume that there are close links between welfare-, sustainability-, and health-based considerations (Harper and Henson 2001), failing to challenge those links can't be helping the cause of fish, and is probably hurting it.

## 5. Conclusion

We applaud effective altruists for evaluating the scope, neglectedness, and tractability of various causes in order to determine how to do the most good. As always, though, the devil is in the details, and we've shown that he's everywhere when it comes to fish. There are a lot of variables to consider, the data is incomplete, cautious assumptions can make us too conservative, and there are ever-present value judgements about what matters.

It's much easier to look at the USDA annual slaughter numbers. When you do, it's plain that we kill many more chickens than any other species of terrestrial farmed animal. And that may help explain why fish have largely been neglected by even the effective altruist community: when quantification is highly valued, it's natural to focus on issues for which clear data is available. That can't be said of fish, but we submit that the data are clear enough. What's more, fish can't wait. They are being killed at a remarkable, increasing, and altogether depressing rate. Effective altruists should focus on them, as should all who care about animals.<sup>30</sup>

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<sup>27</sup> See the USDA's Agricultural Fact Book, Chapter 2, available here: <http://www.usda.gov/factbook/chapter2.pdf>

<sup>28</sup> See AWI's summary of studies on consumer perceptions of farmed animal welfare, available here: [https://awionline.org/sites/default/files/uploads/documents/fa-consumer-perceptionsoffarmwelfare\\_-112511.pdf](https://awionline.org/sites/default/files/uploads/documents/fa-consumer-perceptionsoffarmwelfare_-112511.pdf)

<sup>29</sup> See: <http://www.animalcharityevaluators.org/research/interventions/leafletting/>

<sup>30</sup> Special thanks to Matt Ball, Lewis Bollard, Nikita Patel, Jeff Sebo, Harish Sethu, and Yoni Wilkenfeld, all of whom provided very useful feedback on an earlier version of this paper.

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