October 26, 2007

Ms. Andrea Caroe
National Organic Standards Board
United States Department of Agriculture
Room 4008 - South Building
1400 Independence Ave., SW
Washington, DC 20250-0001

Dear Ms. Caroe:

On behalf of the undersigned organizations, we want to thank you for your careful attention to the development of organic aquaculture standards.

This submission is a consensus of 44 leading organizations within the organic, ocean conservation, animal welfare and food safety communities. Together, we represent millions of voices including consumers, organic farmers and leading conservation organizations in major aquaculture producing and consuming regions. The comments included within this submission refer specifically to those sections of the Aquaculture Working Group's Interim Final Report, which include provisions for use of wild fishmeal and oil species as well as the use of open net pens.

In developing U.S. organic standards over the last sixteen-plus years, Congress, USDA, the NOSB, organic farmers and consumer and environmental advocates have all recognized that creating ecological balance and conserving biodiversity are guiding principles of organic systems. The undersigned groups concur that certain aquaculture practices – specifically the production of herbivorous finfish in closed systems – can be compatible with organic principles.[a] And, we see significant potential for the USDA organic label to "reward" these seafood producers for ecologically sound production practices. However, as we have detailed in past individual submissions, we believe the farming of carnivorous finfish in open net pen systems inherently contradicts organic principles.[b]

Since the most recent decision of the Livestock Committee to defer rulemaking about wild fishmeal and oil and open net pens until further input from industry and the organics community, the undersigned groups have re-evaluated these aquaculture practices to explore if there are any adaptations or improvements to current, carnivorous finfish farming practices that would make it compatible with organic principles.

Our review of the situation has led us to the same frustrating conclusion. Attempting to define organic standards for open net pens and wild fish as feed is like attempting to fit a square peg into a round hole – the principles and the practices are simply incompatible. The more we have tried to adapt open net pens to meet organic principles, the more obvious the inconsistencies have become.[c]

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[a] As outlined by the NOSB Principles of Organic Production and Handling (March 29, 2007)
[b] Ibid.
[c] Many of the examples we provide here are taken from experiences with open net pen salmon farming, given the majority of fish currently raised in open net pens are salmon and a majority of the scientific research on the ecological impacts of raising carnivorous finfish in open net pens pertains to salmon. We believe salmon farming experiences can serve as an indicator of the impacts of farming other carnivorous

Extensive research on the impacts of open net pens on marine ecology has been done and no solution to those impacts has been found, save for the use of technology that creates an impermeable barrier between farmed and wild fish, allows for waste collection, and treats water going into and leaving the farm system. Moreover, there are no consistent or reproducible standards to measure pollution from open net pens, so enforcement regarding pollution problems from open systems is extremely difficult. While some refer to benthic layer sampling as a way to measure pollution from open net pen systems, this type of testing is difficult to standardize. In fact, pollution problems may be missed with this methodology due to inherent turbidity issues.

Further, if we accept the Aquaculture Working Group's proposal to include open net pens and feed from wild fish within organic standards, we are forced to treat the symptoms rather than the disease. In other words, instead of simply prohibiting the use of ecologically harmful farming methods, we are left with organic standards that attempt to reduce the severity of the farming impacts associated with an inherently flawed farming practice, that of carnivorous finfish farming in open net pen systems.

We have found that in several cases attempts to adapt open net pen systems to organic principles have actually forced the trade-off of ecological impacts. For example, organic aquaculture standards already adopted by the Livestock Committee prohibit the use of many harmful synthetic chemicals in organic aquaculture production, as many of the chemicals commonly used by conventional open net pen fish farmers are considered marine pollutants or toxic to the marine environment. However, by prohibiting the use of these chemicals to control the disease and parasite outbreaks associated with carnivorous finfish farming, we dramatically increase the likelihood that open net pen fish farms will act as a reservoir and vector for parasites and disease that can be lethal to both wild and farmed fish, clearly reducing the animals' welfare.

We reiterate our unified support for the development of organic aquaculture standards (specifically herbivorous species) for those species grown in systems where inputs, outputs, health and animal welfare can be monitored and controlled. However, this joint submission reinforces the broad opposition to proposed regulatory provisions that would allow organic aquaculture production to use non-organic, wild fish as feed and open net pen systems.

We commend the Livestock Committee for requesting further comment from the organic community prior to rulemaking on organic aquaculture. We continue to urge the NOSB to ensure that the "USDA Organic" standard is neither modified nor diluted to accommodate either the use of non-organic, wild fish as feed or open net pen systems. It is our hope that the organic label will continue to provide consumers with a clear and consistent understanding of how their food is produced and ensure them that their choice of an organic food product supports a safer, more humane more sustainable environment.

Sincerely,

The Undersigned
(Full list of undersigned organizations provided on pages 3 - 4)

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finfish in these open systems.

The following organizations have signed on to this submission:

Australian Marine Conservation Society (Australia)

Beyond Pesticides (Washington, DC)

Center for Food Safety (Washington, DC)

Conservation Council of New Brunswick (New Brunswick, Canada)

Consumers Union, nonprofit publisher *Consumer Reports* (Yonkers, NY)

David Suzuki Foundation (British Columbia, Canada)

Ecology Action Centre (Nova Scotia, Canada)

Equal Exchange (West Bridgewater, MA)

Florida Consumer Action Network (Tampa, FL)

Food and Water Watch (Washington, DC)

Friends of Clayoquot Sound (British Columbia, Canada)

Friends of the Earth (Scotland)

Friends of the Oldman River (Alberta, Canada)

Georgia Strait Alliance (British Columbia, Canada)

Go Wild Campaign (Bellingham, Washington)

Greenpeace Canada (Quebec, Canada)

Greenpeace USA (Washington, DC)

Gulf Restoration Network (New Orleans, LA)

The Humane Society of the United States (Washington, DC)

Institute for Fisheries Resources (San Francisco, CA)

Living Oceans Society (British Columbia, Canada)

Maine Organic Farmers and Gardeners Association (MOFGA) (Unity, Maine)

Mangrove Action Project (Port Angeles, WA)

National Cooperative Grocers Association (Iowa City, IA)

Northeast Organic Dairy Producers Association (NODPA) (Deerfield, MA)

Northeast Organic Farming Association (NOFA) (Member Chapters in VT, NH, NY, MASS, CT, RI and NJ)

Norwegian Salmon Association (Norway)

OCEANA, South American Office (Chile)

Organic Consumers Association (Finland, MN)

The Organic Research Centre – Elm Farm (United Kingdom)

Pure Salmon Campaign (Washington, DC)

Raincoast Conservation Society (British Columbia, Canada)

Rural Advancement Foundation International (Pittsboro, NC)

Save The Swilly (Ireland)

Sierra Club Canada (British Columbia, Canada)

Sierra Club (South Thomaston, ME)

Slow Food Canada (British Columbia, Canada)

T. Buck Suzuki Foundation (British Columbia, Canada)

Trout Unlimited (Arlington, VA)

Watershed Watch Salmon Society (British Columbia, Canada)

Wilderness Committee (British Columbia, Canada)

Wild Farm Alliance (Watsonville, CA)

Wild Fish Conservancy (Duvall, WA)

Yukon Salmon Committee (Yukon, Canada)

AWG INTERIM FINAL REPORT: PROPOSED PROVISIONS FOR USE OF WILD FISHMEAL AND OIL AND OPEN NET PENS IN US ORGANIC AQUACULTURE STANDARDS

Within this review of organic aquaculture standards, we focus on the specific areas of the Aquaculture Working Group (AWG) Interim Final Report on which the Livestock Committee has deferred rulemaking until further input from stakeholder communities. These areas relate to the use of wild fishmeal and oil as feed ingredients or supplements and the use of open net pen fish farming systems.

Currently, the farming of carnivorous finfish species leads to an overall net loss of fish protein. On average, over three tonnes of wild fish are required to produce one tonne of farmed salmon, [1] while a more recent study calculated that 8.5 kg of wild fish was used to produce 1 kg of Chilean farmed salmon in 2004.[2] The use of such high volumes of feed in open net pen fish farms inevitably has numerous ecological consequences, including pressure on wild fish populations.[3]

Despite a body of peer-reviewed research documenting the ecological impacts of farming carnivores, the AWG Interim Final Report, instead of prohibiting the use of wild fish as feed, proposes provisions for the use of wild fishmeal and oil and attempts to address some of the sustainability concerns related to farming carnivores.

Section § 205.252 Aquaculture feed states:

> (b) Fish meal from wild fish used as a feed additive or supplement may not exceed 12% by weight of feed, and fish oil from wild fish used as a feed ingredient may not exceed 12% by weight of feed as averages over the production cycle of the fish.
>
> (c) Wild fish and wild aquatic animals used for producing fish meal and oil for aquaculture may not be certified or labeled as organic for human consumption unless allowed elsewhere in this rule. Whole, chopped, or minced wild fish that does not qualify in this section may not be used as feed.
>
> (d) Fish meal or fish oil may not be sourced from any fishery classified by relevant state/provincial, national, or international fisheries authorities as follows: “at risk of reduced reproductive capacity;” “suffering reduced reproductive capacity;” “harvested outside precautionary limits;” “over-exploited;” “depleted;” “overfished;” “overfishing is occurring;” or any other comparable classification, or at significant risk of those conditions within the next recruitment cycle.
>
> > (i) Fish meal and fish oil from wild fish and other wild aquatic animals may be used as additives and supplements for organic aquaculture or livestock feeds as provided in this section for seven years after the date when organic standards for farmed aquatic animals are promulgated, and must be derived from wild sources that are in compliance with (c) and (d) may be used as supplements and additives under one of the following:
> >
> > > (1) wild fish, provided that the amount of such wild fish that goes into feeding the aquatic animals cannot exceed one pound of wild fish product fed for every pound live weight of cultured of aquatic animals at harvest; or

(2) carcasses, viscera, and trimmings from the processing of wild fish and other wild aquatic animals that are destined for human consumption. The portions of processed wild fish destined for human consumption may not be certified or labeled as organic unless provided elsewhere in this rule.

The AWG Interim Final Report also includes provisions for the use of open net pen systems, again proposing standards that attempt to address some of the major ecological impacts associated with farming fish in open net pen systems.

Section § 205.255 Aquaculture facilities states:

(k) Open water net-pens and enclosures are permitted where water depth, current velocities and direction, stocking densities, and other factors act to adequately disperse metabolic products in order to minimize accumulation of discharged solids on the bottom sediments under the net pens. However, water currents should not be excessive to cause the fish to expend excessive energy to swim and to be unable to consume feed. Monitoring shall be employed to ensure that the natural assimilative capacity at the site is not exceeded. Facility managers shall take all practical measures to prevent transmission of diseases and parasites between cultured and wild aquatic animals. Use of multiple species of aquatic plants and animals to recycle nutrients must be included in every Organic System Plan for net pens.

CONTRADICTION OF ORGANIC PRINCIPLES

Our re-evaluation of the AWG Interim Final Report's provisions for carnivorous finfish farming in open net pens has confirmed that these proposed standards are inherently inconsistent with a number of key organic principles as outlined by the *NOSB Principles of Organic Production and Handling* (March 29, 2007).[4] Despite several sections included within the NOSB Livestock Committee Aquaculture Standards[5] that attempt to control for, or reduce, ecological impacts associated with fish farming, available research on and experiences with open net pen farming to date leave us unconvinced that the proposed organic standards will ensure that of the farming of carnivorous finfish in open net pens will be consistent with core organic principles.

Below, we review those organic principles outlined by the *NOSB Principles of Organic Production and Handling,* which are contradicted by carnivorous finfish farming in open net pens as proposed by the AWG Interim Final Report:

1.1 Organic agriculture is an ecological production management system that promotes and enhances biodiversity, biological cycles, and soil biological activity.

Escapes of Farmed Fish

The escape of farmed fish is largely an inevitable and unpredictable consequence of farming fish in open net pen systems. For example, 85% of escapes in Scotland during 2003 occurred due to equipment failure, operator error or equipment failure during severe weather.[6]

The environmental impacts of escapes have been well documented globally.[7] Virtually all farmed Atlantic salmon are descended from 40 original stocks of Norwegian Atlantic salmon, and mass escapes of farmed salmon can result in interbreeding and competition with wild salmon as well as facilitation of the spread of disease and parasites such as sea lice.[8] Repeated farm escapes also

can establish self-sustaining feral populations, spread genetic pollution, weaken unique gene pools and lead to an "extinction vortex" in wild salmon.[9] In fact, even if escapes stopped tomorrow, it may already be too late to prevent wild salmon in Scotland from becoming extinct.[10]

Section § 205.250 of the NOSB Livestock Committee Aquaculture Standards addresses the issue of escapes from farming systems. It states: "Adequate measures shall be taken to prevent escapes of cultivated animals and plants from the aquaculture facility and to document any that do occur."

Many farmed salmon producing regions and salmon farming companies have adopted similar, if not more stringent, escapes policies. The State of Norway has actually developed a detailed, "no escapees" action plan.[11] Marine Harvest, the largest farmed salmon producer in the world, also has a zero escapes policy. [12]

However, the goal of zero escapes is far removed from the reality of escapes from open net pens. Within its 2006 annual report, for instance, Marine Harvest states: "Although Marine Harvest has a zero-tolerance for escapes, we have still not been able to prevent them entirely."[13] Despite Norway's zero escapes policy, Norwegian salmon farms self-reported 1.2 million escapes in 2006 alone.[14]

The escapes record is just as daunting in other regions where fish are farmed in open net pens. Since 1997, almost 3 million farmed salmon have escaped from Scottish salmon farms in nearly 150 separate incidents. [15] In 2005 alone, Scottish fish farmers reported over 800,000 escaped fish from net pens, only 605 of which were recovered.[16] In 2005, farmed salmon escapes in Scotland totaled 877,883 with rod and line catches of wild salmon across the whole of Scotland only 83,800.[17] Escapes of farmed salmon therefore outnumbered rod and line catches of wild salmon by 10 to 1. Such a high level of escapees represents an irreversible problem in areas like the West coast of Scotland where wild salmon stocks are even lower (less than 3,000 wild salmon were caught during 2005). [18]

During 2007 thus far, it is estimated that 14 million farmed salmon have escaped from Chilean open net salmon farms – largely due to a tsunami in a major producing region.[19] Figures provided by the Chilean agency, SERNAPESCA, report over 2 million farmed salmon escapes in 2004 alone. These reports do not include "leakages" of farmed fish from open net pens, which seem to be unavoidable and difficult to estimate.

Given the history of farmed fish escapes from net pen systems (despite strict zero escapes policies), we cannot see how an organic standard would be effective in significantly reducing or eliminating escapes from these systems.

<u>Disease and Parasite Transfer</u>

Farming salmon at high stocking densities in open net pens is a breeding ground for bacterial and viral diseases as well as parasites. Disease may be transferred to and from wild fish through the normal flow of tides and currents, and farmed fish may also spread diseases to wild fish through escapes into the wild environment.

Given the open nature of the net pen system and the common proximity of farms, outbreaks of disease and parasites are often difficult if not impossible to quarantine. For example, over 70 different diseases and disease agents were reported on Scottish salmon farms between 1980 and 2006. The number of different diseases and disease agents reported on Scottish salmon farms steadily increased from 2 in 1981 to a high of 28 in 1996, and then rose again in 2001.[20]

The scale at which fish are farmed in open net pens is usually much greater than what would occur under natural conditions, creating the conditions for concentrations of parasites and disease that are not present in a natural setting. In addition, the presence of fish farms disrupts the spatial and temporal separation of age classes present in marine ecosystems that prevents infection and death of vulnerable wild populations such as juvenile salmon. For example, scientific research published in October 2006 by the National Academy of Sciences shows that sea lice infections on salmon farms in British Columbia can kill up to 95% of young wild salmon as they migrate out to sea past salmon farms.[21] In Norway, the Directorate for Nature Management has estimated that in some areas, 90% of the outgoing wild salmon smolt run carries lethal lice levels.[22]

Salmon farmers are often dependent upon an assortment of chemicals – including antibiotics, antiparasitics and disinfectants to control diseases within open net pen farms.[23] The sheer amount of chemicals used is evidence of the disease problems associated with open net pen fish farming. For instance, in 2006, Scottish salmon farmers reported using over 1000 liters of the antiparasitic, Excis (cypermethrin) and close to 12 million grams of the antiparasitic, Slice (emamectin benzoate) to control sea lice.[24]

While diseases pose a problem for farmed and wild fish, some of the chemicals commonly used to combat diseases are harmful or toxic to wild marine organisms. For example, scientific papers have shown that the sea lice treatment, cypermethrin, has impacts on marine plankton communities such as copepods[25] and effects on shellfish species such as mussels, lobsters and crabs.[26] It has also been shown to impact wild salmon's sense of smell and reproduction.[27] Another commonly used sea lice treatment, emamectin benzoate, is toxic to birds, mammals, fish, shellfish and other aquatic organisms (particularly invertebrates) and is labeled by the chemical manufacturer as a 'Marine Pollutant'.[28] [29] [30] In 2005, an Environment Canada report recommended further research on the environmental impacts of the use of emamectin benzoate in finfish farming.[31]

The AWG Interim Final Report briefly addresses disease concerns related to open net pen production. Section § 205.255, part (k) states: "Facility managers shall take all practical measures to prevent transmission of diseases and parasites between cultured and wild aquatic animals." At the same time, organic producers are prohibited from using the synthetic chemicals commonly used to combat disease and parasites, such as antiparasitics and antibiotics.

Given the open nature of the net pen systems and close proximity of wild and farmed fish, it is difficult to determine how an organic farm manager would truly prevent disease transmission without the ability to use synthetic chemical treatments. For example, several organic salmon farms in Ireland reported the highest sea lice loads of all Irish salmon farms in November 2005. It is possible that organic principles that prohibit many of the most effective chemical disease treatments may actually result in more severe disease problems.

Marine Mammal (Predator) Impacts

The open net pen system inevitably attracts predators such as sea lions and seals. Predation not only results in stress and possible injury or loss of farmed fish, but these predators may become entangled and drown in fish nets or the nets designed to keep predators away from the farm environment. Fish farmers have been reported to intentionally kill predators such as sharks or marine mammals, though the U.S. Marine Mammal Protection Act prohibits the import of any product that intentionally takes a marine mammal. However, reporting of marine mammal deaths including intentional kills and entanglements is uncommon.

The NOSB Livestock Committee Aquaculture Standards, Section § 205.254 Aquaculture living conditions, Part (b), addresses the predator control issue. It states:

> [T]he culture system must be managed to minimize the risk of losses of cultured stock and stress to cultured aquatic animals caused by predators, and harm to predators. Organic aquaculture facilities must develop an integrated Predator Deterrence Plan as described in the Organic System Plan that identifies potential predators, appropriate deterrence methods, how predator behavior will be modified by application of deterrence methods, documentation of control methods and effects, contingencies for failure to achieve objectives, and how plan implementation conserves biodiversity in the ecosystem adjacent to and including the aquaculture facility.

However, experiences with open net pen fish farming demonstrate that it is difficult to prevent predation by marine mammals and often impossible to predict. For example, a study of a single salmon farm in British Columbia, Canada, found that over a four-year period 431 harbour seals, 38 sea otters, 29 sea lions, one harbour porpoise, 16 herons, and one osprey were killed by anti-predator devices.[32]

On co and the United States Marine Mammal Protection Act (MMPA) prohibits the importation of any product that intentionally killed or aimed to kill a marine mammal. The most common form of predator control in open net pen fish farming today are likely predator nets, additional net barriers surrounding the fish farm nets.

While predator nets can be effective in keeping a distance between predators and farmed fish, recent experiences demonstrate that these methods can be lethal to marine mammals and endangered species. Although British Columbia farms are not required to report marine mammal entanglements, one British Columbian salmon farm recently reported 110 sea lion deaths from entanglement and drowning in its predator nets in 2007, thus far. Of these, 51 drowning deaths of California sea lions occurred in one single incident.[33] The farm is located in the UNESCO Biosphere Reserve and is a member of the Pacific Organic Salmon Association (POSA).

If this farm is any indicator of the degree of marine mammal entanglements that may occur in open net pen fish farms – even farms that adopt Predator Deterrence Plans – it is likely that organic open net pen fish farms would result in significant loss of biodiversity of marine mammal populations (not to mention other vulnerable predator populations such as dolphins, sharks, seabirds and so on).

1.2.5 Utilize production methods and breeds or varieties that are well adapted to the region

The Livestock Committee's Aquaculture Standards and those open net pen provisions proposed in the AWG Interim Final Report do not require that only native fish of local genotype be farmed in open net pen systems. Given the propensity of escapes from open systems, the farming of exotic or non-native species (such as Atlantic salmon in the Pacific) appears to contradict this organic principle.

1.2.6 Recycle materials of plant and animal origin in order to return nutrients to the land, thus minimizing the use of non-renewable resources

Open net pen, carnivorous fish farms are a source of various waste discharges including suspended and dissolved organic matter, feces, excess feed and other contaminants.[34] The

Livestock Committee's Aquaculture Standards and the open net pen provisions proposed in the AWG Interim Final Report do not require organic managers to fully recycle fish farm wastes.

1.2.7 Minimize pollution of soil, water, and air

As stated above, open net pen, carnivorous fish farms are a source of various waste discharges including suspended and dissolved organic matter, feces, excess feed and other contaminants. Experts have calculated that industrial salmon farms, each extending over several acres of coastal waters, discharge extremely high concentrations of untreated sewage. Researchers around the world have recognized the harm from open net pen salmon farms and the long-term impacts on water quality, fisheries resources and seabed ecology.[35]

Sewage and other wastes from salmon farming causes far-reaching environmental harm by contaminating the sea-bed and its shellfish species and causing eutrophication that triggers toxic algal blooms. Based on reported feed use by Scottish open net pen fish farmers in 2005, Scottish farmers have reportedly discharged into the Scottish marine environment: approximately 8.8 million kilograms (8,800 tonnes) of nitrogen; 28.3 million kilograms (2,830 tonnes) of total organic carbon and approximately 1.16 million kilograms (1,160 tonnes) of phosphorous.[36] Scientists in Scotland, Norway, Ireland and Canada have all shown that some of these effects may last several years and extend for several hundred meters away from salmon farm.[37]

Section § 205.255, Part (k) of the AWG Interim Final Report proposes that: "open water net-pens and enclosures are permitted where water depth, current velocities and direction, stocking densities, and other factors act to adequately disperse metabolic products in order to minimize accumulation of discharged solids on the bottom sediments under the net pens."

While this standard may lessen the discharges from a single farm or the accumulation of a single farm's wastes on the seabed directly below the farm site, it does not address the scale of production (number of farms in one area) or carrying capacity of the local marine environment. Further, neither the AWG proposed net pen provision nor the Livestock Committee Aquaculture Standards include specific standards to protect pristine water bodies or critical or sensitive habitats from the nutrient pollution associated with open net pen fish farms. We know, for example, that salmon farms are permitted to discharge untreated waste effluents into some of Scotland's most pristine water bodies, classified as Special Areas of Conservation and protected under the European Commission's Habitats Directive in 2004 (formally designated by the Scottish Government in 2005).[38] [39]

Perhaps the most concerning realization is that despite the commercial availability of alternative production systems that allow for the collection and treatment of wastes from carnivorous fish farms (i.e. fully closed containment systems), the AWG's proposed provisions allow for a farming system, which by design, cannot collect or treat its own farm pollution. And, this pollution has very immediate and direct impacts on the marine environment in which the farm is located.

1.3.1 Providing good quality organically grown feed

The NOSB has previously determined that wild fish cannot be certified as organic. As such, wild fishmeal and fish oil are also non-organic feed ingredients. In including provisions for the use of non-organic, wild fishmeal and fish oil within organic aquaculture production, the AWG proposed standards violate this core, organic principle.

1.3.4 Promoting animal health and welfare while minimizing stress; and

The open net pen system, by design, exposes farmed fish to a host of stressors including natural predators (sharks, marine mammals, birds) disease and parasites. According to a 2007 report by Compassion in World Farming (CIWF) and the World Society for the Protection of Animals (WSPA), "if untreated, sea lice infestation can lead to fish suffering greatly and dying…More 'environmentally-friendly' methods – hydrogen peroxide and the use of wrasse to eat the lice off the salmon – have serious animal welfare drawbacks."[40] Additionally, it states that are "few more stressful encounters for confined fish than a seal or other predator lunging through the cage netting and taking a bite." Given the open nature of the net pen systems, we remain skeptical that a farm manager could promote welfare while minimizing stress in an open farming system.

1.4.2 Organic products are not commingled with non-organic products, except when combining organic and non-organic ingredients in finished products which contain less than 100% organic ingredients

The open net pen system, by design, allows farmed organic fish to commingle with a variety of non-organic inputs such as wild fish, other marine organisms, parasites, and other potential contaminants in the marine environment. By including provisions for open net pen systems in organic production, the AWG Interim Final Report contradicts this key, organic principle.

1.5 Organic production and handling systems strive to achieve agro-ecosystems that are ecologically, socially, and economically sustainable.

While Section § 205.252 of AWG Interim Final Report may help to reduce wild fish dependence by an individual organic farm, without restricting the number of organic carnivorous fish farms, the AWG standard cannot control for the overall pressure that organic aquaculture will place on the marine food web. From an ecological perspective, it may make little difference if 50 or 1,000 farms cause unsustainable pressure on wild fish populations.

Further, the AWG's allowance of wild fish as a substantial component of feed is somewhat behind the trend in conventional fish farming. While wild fishmeal and fish oil were once relatively cheap, abundant ingredients, the growth in demand for these ingredients coupled with limited supply has led to a sharp increase in costs for these ingredients. Recently, fish farming and feed industries have made significant strides in improving feed conversion ratios and in reducing the amount of fishmeal and fish oil in farmed fish diets. Thus, while the conventional fish farming industry is rapidly moving towards substitution of fishmeal and oil with alternative protein sources, the AWG's proposed standards include provisions for the use of an increasingly expensive and unsustainable ingredient.

In its 2006 Annual Report, the former CEO of Marine Harvest – the world's largest farmed salmon producer – describes the current climate in the fish farming industry regarding wild fish as feed:

> The wild fish catch, which has been and continues to be an important feed ingredient, is not developing well and may even be stagnating. Sceptics [sic] use this to feed their anxiety over the availability of raw materials. Our response is to remind them that as for other animals, or humans for that matter, there is more than one type of food that lends itself to keeping farmed fish healthy and developing. Many decades of nutrition research has yielded comprehensive knowledge about what farmed fish need to grow and stay healthy. While many fish species are vegetarians to start with, species such as salmon can

> live and grow on a quite varied diet, where there is no need for it to be dominated by pure marine protein. This means that in the years to come we will see more and more of this red, omega-3 rich fish, regardless of whether catches of wild fish stay at the current level or are increased. Bearing this in mind, Marine Harvest is putting even greater effort into research and development.[41]

Similarly, Part (d) of the AWG aquaculture feed standard – a requirement that fishmeal and fish oil not be obtained from over-exploited or unsustainable fisheries – is very much in line with claims already made by conventional fish feed producers and fish farming companies. For example, the world's largest fish feed producer, Skretting (Nutreco), assures the public that they "only purchase marine raw materials from suppliers than can demonstrate their products are from managed and sustainable fisheries." [42]

FORCED TRADE OFFS OF ECOLOGICAL IMPACTS

In some cases, the very standards included in the Livestock Committee Aquaculture Standards and AWG Report aimed at addressing the major ecological impacts associated with open net pens may actually lead to further, albeit unintended, ecological or human health impacts. Part of the problem seems to evolve from the fact that aquaculture production is simply different than terrestrial agriculture production. Where an organic requirement may work to reduce harmful impacts in organic agriculture, it may actually lead to additional harm in organic aquaculture production.

Below, we highlight two examples of these inconsistencies and forced trade offs:

Disease and Parasites – Protect Fish Welfare, Wild Fish, the Environment or Human Health?

As discussed in the previous section, peer-reviewed research has documented the increased disease and parasite transfer associated with open net pen fish farms. These diseases not only pose significant health threats to farmed fish but can also be lethal to wild fish.

In conventional fish farming, farm managers reserve the ability to use chemical treatments to control disease outbreaks in the farm environment. Due to the serious environmental and potential human health impacts of many of these chemical controls, organic principles prohibit their use in most cases. For example, *Section 1.3.5 of the NOSB Principles of Organic Production and Handling* (March 29, 2007)[43] requires: "Avoiding the routine use of chemical allopathic veterinary drugs, including antibiotics."

However, by removing the option to use these chemicals in organic open net pen production, organic open net pen farms become a greater threat to wild fish in terms of disease levels and likelihood of transmission than conventional open net pen farms that employ chemical treatments.

It is our understanding that in organic livestock production, an organic farm manager is first required to employ approved, natural substances or less potent methods as a primary approach to controlling disease. Failing this approach, the farm manager is required to use prohibited, non-organic substances to eliminate the disease. This serves the dual purpose of protecting the livestock's welfare while reducing the spread of disease to other livestock. If prohibited substances are applied, the treated animal then loses its organic status.

This approach is applied in Canada, where the sea lice chemical, emamectin benzoate (Slice), has

not been approved for general use in aquaculture production but is continually authorized for emergency use on salmon farms to treat sea lice. The emergency approval of emamectin benzoate is continuously granted because nothing else is known to be effective to reduce sea lice infection on salmon farms that poses an established risk to both farm stock and wild salmon.

Applying this approach to organic aquaculture production in open net pens is seriously problematic, however. First, unlike terrestrial livestock, the application of chemical treatments (chemical baths or in-feed treatments) is not animal specific. In other words, a non-organic chemical applied to one fish must be applied to all fish within the net pen. Thus, all fish within the net pen would lose their organic status. Second, depending on the location and proximity of a chemically treated net pen to other net pens within the fish farm, other fish within the greater farming area are at risk of exposure and contamination by the chemical treatment (i.e. organic net pens down current from the chemically-treated, non-organic net pen).

Lastly, unlike most cases in the treatment of terrestrial livestock, bath treatments or in-feed treatments commonly used in fish farming cannot be contained to the farm fish, no less the farm site. As discussed above, many of the most effective and common antiparasitic treatments used in open net pen finfish farming are considered marine pollutants or toxic to marine organisms. In other words, the very organic standard aimed at reducing ecological damage would be proscribing that very thing. Additionally, the accumulation of administered antibiotics to wild fish poses obvious human health concerns in terms of antibiotic-resistance.

Thus, organic net pens lead to a complicated, Catch-22 situation, where one is forced to choose between the use and discharge of toxic or harmful chemicals or an increased ecosystem disease risk and potentially devastating impacts on wild fish populations. The undersigned groups strongly urge the NOSB to avoid adopting organic aquaculture standards that force such serious trade offs between ecological impacts, given that 1) an aim of an organic systems is to be as ecologically sensitive as possible and 2) technically feasible solutions or alternatives (i.e. closed containment systems) already exist.

Predator Deterrence – Protect Fish Welfare, Marine Mammals or the Environment?

Section § 205.254, Part (b) of the Livestock Committee Aquaculture Standards requires farm managers to develop an integrated Predator Deterrence Plan. Since the intentional killing of marine mammals is forbidden under the U.S. Marine Mammal Protection Act (MMPA) and acoustic harassment devices are banned in some salmon farming regions, the most likely form of predator deterrence that would be employed by an organic open net pen farm is a predator net or shark guard.

As discussed in the previous section, however, predator nets may be reasonably effective in reducing predation on farmed fish, but marine mammals and other predators may become entangled and drown in the nets. For example, one British Columbian salmon farm that is a member of the Pacific Organic Salmon Association (POSA), reported 110 sea lion deaths from entanglement and drowning in its predator nets in 2007, thus far. Of these, 51 drowning deaths of California sea lions occurred in one single incident.[44] The farm is located in the UNESCO Biosphere Reserve. Based on the AWG proposed net pen standards, this farm would still be eligible for organic status despite the significant loss of marine wildlife directly resulting from the farming method.

While the farm discussed above may be an indicator of the frequency or extent of marine mammal entanglements in open net pen fish farms, major carnivorous fish farming regions do not

require farms to report entanglements or unintentional drowning of marine mammals. Thus, the true impact of net pen aquaculture on marine mammals and other predator populations is not well documented.

The situation is further complicated when you consider that there is some indication that entanglements and drowning increase where predator nets are not treated with copper-based antifoulants (copper weighs down and reduces slack in the nets). The B.C. salmon farm that experienced the 110 sea lion deaths in 2007 referenced above does not use copper-based antifoulants on its nets.[45]

Organic aquaculture standards, however, prohibit the use of copper-based antifoulants, due to toxicity concerns. According to the Scottish Environment Protection Agency's Scottish Pollutant Release Inventory, copper is toxic to some microorganisms, disrupting nutrient-cycling and inhibiting the mineralization of essential nutrients such as nitrogen and phosphorus and can bio-accumulate in some species. Toxic effects on fish and other aquatic organisms have also been observed.[46] Scientific research has shown copper contamination of sediments and shellfish such as lobsters in the vicinity of salmon farms.[47] Thus, allowing copper-based antifoulant use as a means of reducing marine mammal entanglements in open net pens is not an ecological sound or organic option.

Once again, the AWG proposed standards for open net pen aquaculture, would allow for an organic farming system that would not only impact and potentially kill marine mammals, but would also potentially force a situation where organic farms would possibly experience greater marine mammal and predator entanglements and deaths than conventional farms. The undersigned groups strongly urge the NOSB to avoid adopting organic aquaculture standards in light of serious animal welfare and ecological impacts, given that 1) an aim of an organic systems is to be as ecologically sensitive and welfare friendly as possible and 2) technically feasible solutions and alternatives (i.e., closed containment systems) already exist.

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