

SALMON AQUACULTURE DIALOGUE

BOSTON, MASSACHUSETTS, USA

MARCH 12-13, 2009

Meeting Summary

Prepared by World Wildlife Fund, on behalf of the Salmon Aquaculture Dialogue's Steering Committee
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MEETING BACKGROUND

The Salmon Aquaculture Dialogue met from March 12-13, 2009 in Boston, Massachusetts. This was the 13th meeting of the salmon Dialogue since it was created in 2004. The Dialogue coordinator, Katherine Bostick, facilitated the meeting with assistance from the Steering Committee. Breakout sessions were facilitated by Steering Committee (SC) members.

The expected outputs of the meeting included:

- 1) Shared understanding of the salmon Dialogue, including the process and related definitions, governance, work completed to date, and how participants can play a role in the Dialogue;
- 2) Participant input for use by the SC to finalize criteria; and
- 3) Improved understanding of the environmental impact associated with disease and parasites, as well as initial ideas for how to address these impacts within the salmon Dialogue.

This document offers a summary of the key issues related to the meeting and next steps for the salmon Dialogue. Any omission or errors are the sole responsibility of the Salmon Aquaculture Dialogue Steering Committee, which convened the meeting. Meeting participants were allowed two weeks to comment on a draft meeting summary.

PRE-MEETING OUTREACH

Invitations were sent to the approximately 500 stakeholders on the salmon Dialogue e-mail distribution list. The meeting was publicized on the Dialogue website and in the Dialogue e-newsletter.

MEETING RESULTS

More than 55 individuals participated in the meeting, including representatives from the salmon aquaculture industry, international and local NGOs, governments and seafood buyers. The approximate breakdown of meeting participants by sector is as follows: 28% industry, 50% NGO, and 22% others, including government, seafood buyers and academics. Following are the key points raised and agreements reached, by topic area, at the meeting. All documents and presentations referred to in the meeting summary are available at <http://www.worldwildlife.org/what/globalmarkets/aquaculture/salmon-additionalresources.html>

Aquaculture Dialogues Purpose and Process

SC members and the Dialogue coordinator presented the history and purpose of the Salmon Aquaculture Dialogue.

Key issues focused on:

- The salmon Dialogue is one of eight Aquaculture Dialogues initiated by WWF-US. Each species-group specific Aquaculture Dialogue focuses on key negative environmental and social impacts of production and follows a similar standards development process.
- The Aquaculture Dialogues are open to all interested stakeholders committed to the goal of the Dialogue. The Dialogue process is designed to be open and transparent, as well as to result in standards that are performance-based, science-based and measurable.
- Individuals and organizations can participate in the Dialogues in various ways, including attending Dialogue meetings, serving by appointment on a technical working group (TWG) or advisory group, or providing input via other means of communication (e.g., website, email and phone communication).
- The standards can be used to certify products and benchmark other standards. They also can create the foundation for buyer and investment screens and be incorporated into government programs.
- Standards will be geared toward the better performers in the industry and designed to encourage innovation.
- The salmon Dialogue was initiated to address key negative impacts of salmon aquaculture. The goal of the Dialogue is to credibly develop and support the implementation of measurable, performance-based standards that minimize or eliminate the key environmental and social impacts of salmon farming, while permitting the industry to remain economically viable.
- The salmon Dialogue is governed by a nine-member, multi-stakeholder SC. Details on the SC and their decision-making protocols are available on the Dialogue website at www.worldwildlife.org/salmondialogue.
- Salmon Dialogue participants have agreed on seven key areas of negative impact: benthic impacts and siting; chemical inputs; disease and parasites; escapes; feed; nutrient loading and carrying capacity; and social impacts.
- Scientific TWGs were formed by the salmon Dialogue to develop reports about the state of information on the key impact areas. Five reports were completed, presented at full Dialogue meetings, and posted on the website.
- At previous salmon Dialogue meetings, participants have discussed the goals and objectives of the Dialogue, the impact areas, TWG reports and draft principles. Participants at the Boston meeting will discuss impacts associated with disease and parasites, using the presented TWG report as a basis. Participants will also provide additional input to help finalize criteria.

Technical Working Groups on Disease and Parasites

The first day of the meeting was dedicated to the presentation and discussion of the two reports that were developed by the Disease and Parasites Technical Working Group.

Drs. Larry Hammell and Crawford Revie of the Atlantic Veterinary College of Prince Edward Island presented the general disease report and the subgroup report on sea lice. These reports had been commissioned by the salmon Dialogue to help clarify the state of knowledge on disease and parasites in salmon aquaculture and associated impacts on the environment. The reports, which were authored by small groups of experts in the field, are available on the Dialogue website at <http://www.worldwildlife.org/site/PageNavigator/SalmonSOIForm>.

Key themes and issues that arose during the presentations and discussion included:

- There are a lot of unknowns surrounding disease in wild fish, though unknown does not mean that they are absent. Salmon farming provides the opportunity to study salmon disease. The inclusion of more wild fish expertise on the TWG may have helped to pull in more details on effects on wild populations.
- Salmon farms can increase the relative abundance of a disease that is already present in the wild by:
 - Multiplying and maintaining the amount of pathogens in the local environment
 - Moving pathogens out of cages in escapees
 - Attracting wild fish to cages (decreasing spatial distance for exposure)
- Risk to wild fish populations can be reduced by:
 - Reducing the likelihood that farmed fish are infected or infectious (e.g., general immune protection and strategic use of treatments)
 - Reducing the environmental burden of pathogens (e.g., hygiene and fish slaughter policies)
 - Reducing the likelihood that infectious farmed fish and wild fish interact (e.g. siting, fallowing and physical barriers)
- Many case studies provide evidence that pathogens can affect fish population dynamics, though generally there is more information available about the effects of disease at the individual level. However, there are also case studies where there is no detectable effect on wild populations, despite that expectation.
- It will be very challenging to develop indicators and standards that tell us about the impact on the environment and can be commonly translated across regions.
- Fallowing and single year-class separation were highlighted as important management tools to break disease cycles.
- It is not plausible to draw a single over-riding conclusion regarding the potential negative impacts of sea lice on all wild fish stocks worldwide. Nevertheless, the experts on the TWG on sea lice believe that the weight of evidence is that sea lice of farm origin can present, in some

locations and for some host species populations, a significant threat. Hence, a concerted precautionary approach both to sea lice control throughout the aquaculture industry and to the management of farm interactions with wild salmonids is expedient.

- In an open production system, it is practically impossible to avoid initial infection of farmed fish with sea lice or to subsequently avoid infection of wild fish found in the vicinity of fish farms. Lice levels on farms are rarely going to be so severe as to damage the health of farmed fish. For wild salmon, even low levels of infection can be problematic for vulnerable populations (e.g., newly migrating smolts). However, there are tools that can prevent initial infection from becoming a problematic disease and reduce impact.
- There is a need to find a balance of chemical treatments and disease, given that both can have environmental impacts. There was some discussion around the potential to use wild fish to identify sea lice treatment triggers, and the complexity of this idea.
- The basic principles for managing disease and parasites on farms are known, but it takes a long-term commitment to make them work, and can require cooperation among multiple sites and producing companies.

Criteria

Much of the second day of the meeting was dedicated to working in small, multi-stakeholder groups of 7-10 participants to discuss draft criteria. Each small group was facilitated by a member of the SC and recorded the key points of their discussion.

Small group discussion was initiated with a presentation that included the following key points:

- Clarification of the definitions of the terms principles, criteria, indicators and standards.
- The fact that the principles went through several iterations of comments and revisions and were finalized after the November 2008 meeting of the salmon Dialogue.
- The draft criteria being discussed at the meeting had been revised after a previous draft was presented and discussed in depth at the November 2008 meeting. The criteria were also posted on the website for comment in advance of the March 2009 meeting in order to collect comments from individuals who were not able to attend the meeting. The SC aims to finalize criteria based on feedback from the meeting and the web. Once finalized, they will be posted on the website and shared with the experts who will use them to draft indicators.

Notes from all of the small groups were captured and were consolidated into a single document, which is in the appendix of this meeting summary. An updated document of finalized principles and criteria will be developed and posted when complete.

Key themes and issues that arose in the breakout sessions include:

- It is difficult to discuss criteria without getting into some discussion of indicators. Developing indicators will also serve to define what is intended by the criteria.
- There still may be areas of overlap or gaps identified after indicators are developed.
- The salmon Dialogue needs to clarify what species these standards would be applied to, and what technologies they would apply to if there are technology restrictions.
- Potential impacts of production of smolt in lakes should be addressed through this process. It is not evident at the criteria level that it is being included.
- The criteria “cumulative impacts” under Principle 2 was highlighted as needing clarification, and as being a particularly challenging area for indicator development.
- How are the terms “critical” and “sensitive” defined under Principle 2 in reference to habitats and species?
- For any standard related to introduced species, will the standard be considered retroactively or only in the future? This question may arise on other specific issues as well.
- The salmon Dialogue has moved forward slowly and there is a desire for the standards development process to move forward more quickly.

Next Steps

The activities planned in the Dialogue during the coming months were presented.

Key points from the presentation:

- Final versions of the disease and parasites TWG reports will be posted in April once the reports are finalized. They will then be open for public comment via the web, and a request for comments will be sent to the salmon Dialogue mailing list at the beginning of that public comment period. Comments collected will be used along with feedback on the reports from the Boston meeting in the development of indicators and standards.
- Finalizing criteria: The SC will use feedback from the Boston meeting to revise the criteria. Final draft criteria will be posted on the website once completed. Principles and criteria will be considered closed for comment until the full suite of draft principles, criteria, indicators and standards is developed and open for comment.
- Experts will be identified to draft indicators, taking into account previous work in the Dialogue related to indicators. The SC aims to hold a workshop with the experts in June 2009 to discuss draft indicators. After the workshop, draft indicators will be presented for feedback to the Dialogue. The SC aims to have draft standards developed in the first quarter of 2010.
- The Dialogue website will continue to be updated with new information as it becomes available.
- The SC appreciates all feedback related to the Dialogue in general or specific documents, such as the draft principles and criteria. Questions and comments can be sent to the Dialogue coordinator or to any SC member, and will be shared within the SC.

- Meeting participants may have seen the recent announcement of WWF's intention to move forward with the development of the ASC. A plan for moving forward is under development, and it will include an extensive outreach strategy and opportunities for feedback. For more information on this development, visit www.worldwildlife.org/aquadialogues, or contact WWF-US Aquaculture Program Managing Director Jose Villalon at jose.villalon@wwfus.org.

The meeting closed with a recognition of the significant input provided by the meeting participants, the extensive work of the Technical Working Group on Disease and Parasites, and appreciation for the effort of all those who participated and helped ensure the success of the meeting.

ATTACHMENTS:

Agenda

March 12, 2009

- 8:30 Check-in and Coffee
- 8:45 Welcome & Introductions
- 9:00 Presentation: History and Progress of the Salmon Aquaculture Dialogue
- 9:45 Presentation: Overview of the Reports of the Dialogue Technical Working Group on Disease and Parasites, by lead authors Larry Hammell and Crawford Revie
- 10:00 Presentation & Discussion: Chapters 1, 2 and 3 of the Disease Report
- 10:40 Coffee Break
- 11:00 Presentation & Discussion: Chapters 4 and 5 of the Disease Report
- 12:00 Review and Summary of Key Discussion Points
- 12:30 Lunch (provided)
- 1:15 Presentation & Discussion: Chapters 1, 2 and 3 of the Sea Lice Report
- 2:00 Presentation & Discussion: Chapters 4 and 5 of the Sea Lice Report
- 3:00 Coffee Break
- 3:30 Presentation & Discussion: Chapter 6 of the both reports
- 4:30 Cross-Cutting Discussion and Implications of the Reports for Standards Development
- 5:30 Close of meeting

March 13, 2009

- 8:30 Check-in and Coffee
- 9:00 Welcome and Review of Day One
- 10:00 Presentation: Developing Principles, Criteria, Indicators, and Standards
- 10:30 Coffee Break
- 10:50 Breakout Sessions to Discuss Revised Draft Criteria
- 12:30 Lunch (provided)
- 1:30 Presentations to Summarize Key Outcomes of Breakout Discussions
- 2:15 Open Discussion
- 3:00 Next Steps and Parking Lot Issues Discussion
- 3:30 Close of Meeting

List of Meeting Participants

First Name	Last Name	Organization
Dave	Anderson	Aquarium of the Pacific
Petter	Arnesen	Marine Harvest ASA
Simon	Ashe	Salmon Watch Ireland
Clare	Backman	Marine Harvest Canada
Jane	Barnett	Department of Fisheries and Oceans, Aquaculture Management Directorate
Sebastian	Belle	Maine Aquaculture Association
Lise	Bergan	Cermaq ASA
Katherine	Bostick	World Wildlife Fund - US
Sandra	Bravo	Universidad Austral
Peter	Bridson	Monterey Bay Aquarium
Fiona	Cameron	The Sea Trout Group
Marcelo	Casali	Sernapesca
Philip	Chou	Seafood Choices Alliance
Marius	Dalen	The Bellona Foundation
Steven	Damato	Changing Seas
Gastón	Dupre	AquaChile
John	Forster	Forster Consulting Inc.
Giuliana	Furci	Fundacion Terram
Paddy	Gargan	Central Fisheries Board, Ireland
Caroline	Graham	New Brunswick Salmon Growers Association
Sam	Haltiwanger	Pew Environment Group
Larry	Hammell	Atlantic Veterinary College, UPEI
Katy	Hladki	New England Aquarium
Rachel	Hopkins	Pew Environment Group
Rodrigo	Infante	SalmonChile
Teresa	Ish	Environmental Defense Fund
Heather	Jones	Scottish Government, Marine Directorate
Pheroze	Jungalwalla	Tasmanian Salmonid Growers Association
Andrea	Kavanagh	Pew Environment Group
Dale	Kelley	Alaska Trollers Association
Martin	Krkosek	University of Washington
Scott	Landsburgh	Scottish Salmon Producers' Organisation
Trygve Berg	Lea	Skretting
Gerald	Leape	Pew Environment Group
Merrielle	Macleod	World Wildlife Fund - US
Kjell	Maroni	Norwegian Seafood Federation
Robert	Martin	Arch Chemicals
Jeanne	McKnight	McKnight and Company

Paula	Moreno	WWF Chile
Scott	Nichols	Dupont
Corey	Peet	David Suzuki Foundation
Stan	Proboszcz	Watershed Watch Salmon Society
Dawn	Purchase	Marine Conservation Society
Crawford	Revie	Atlantic Veterinary College, UPEI
Justine	Reynolds	SYSCO
Jay	Ritchlin	David Suzuki Foundation
Lisa	Robichaud	Fisheries and Oceans Canada
Carson	Roper	World Wildlife Fund - US
Alejandro	Salinas	El Canelo de Nos
Ruth	Salmon	Canadian Aquaculture Industry Alliance
Melanie	Siggs	Seafood Choices Alliance
Don	Staniford	The Pure Salmon Campaign
Catherine	Stewart	Living Oceans Society
Michael	Szemerda	Cooke Aquaculture
Paula	Terrel	Alaska Marine Conservation Council
Matt	Thompson	New England Aquarium
Michael	Tlusty	New England Aquarium
Mary Ellen	Walling	Canadian Aquaculture Industry Alliance & BCSFA
Justine	Williams	Food and Water Watch

Compiled Small Group Discussion Notes: Salmon Aquaculture Dialogue meeting March 12-13, 2009

Background

At the Salmon Aquaculture Dialogue meeting on March 12-13, 2009, meeting participants split into eight diverse groups to discuss the proposed set of draft criteria that will be built upon as the Dialogue develops standards. This document contains the compiled collected notes and comments from small group discussion on draft criteria at the Salmon Aquaculture Dialogue meeting on March 12-13, 2009. The final draft principles and revised draft criteria that were the basis for discussion are available at <http://www.worldwildlife.org/what/globalmarkets/aquaculture/salmon-additionalresources.html>.

Broad-based comments (not specifically related to a single principle/criteria)

- Concern expressed about the use of GMO's at all levels of the process and we want to make sure that these principles and criteria address the use of GMO's and transgenics in all levels from feed to broodstock to species used for other purposes.
- Suggestion to add a new principle and that is: Harmonize the collection and management of global data and increase transparency of the data.
- Suggestion to add component related to consumer and community health and safety.
- Principles 2&3 overlap, this is not a problem, but it should be recognized and acknowledged as we move forward.
- Need to update the "relevant impacts" listed under each to reflect where we consolidated and eliminated redundancies.
- Where does processing fit into this?
- Specify clearly also whether freshwater phase of production is covered.
- Clarify what species are covered by this – Atlantic salmon? Pacific salmon? Sea Trout?
- principles and criteria are supposed to cover the impacts of effects we're trying to reduce
- How do we know if the implementation of best practices is reducing impact on the environment?
- How do we ensure quality of the data? How are data collected?
- How are principles 6 & 7 different?

DRAFT PRINCIPLES	SUGGESTED EDITS TO CRITERIA FROM EACH GROUP	NOTES FROM DISCUSSION WITHIN EACH GROUP
<p>P1: Comply with all applicable international and national laws and local regulations.</p>	<p>Proposed edit 1.1: change “local” to “sub-national”</p> <p>Proposed new criteria:</p> <ul style="list-style-type: none"> • Codes of practice 	<ul style="list-style-type: none"> • One group thinks this is covered with the caveat that BMPs should be implemented in all regions. There is a requirement to following the local laws but that ignores the disparity of laws between the regions – this leads to a double standard that is harmful to the local environment and communities – multi-nationals should be required to implement best management practices whether they are required by the local law or not. • Good if a library could be developed on internet to facilitate availability • Some codes are audited, those would be easy to include, but some codes are not audited • All agreed, no comments. • Should a market driven requirement be included in the criteria? • Legal requirements should be compared to market driven requirements and considered to be included in the final draft of the criteria. • Is compliance on a company level or a farm level? Example: a farm that is not certified gets a fine, does that prevent the entire company from being certified or only prevent that specific farm from being certified? • Would non-compliance apply on a farm level or a company level? • should compliance with local Bay Area Management agreements be included here, in other principles, or at all. • group saw the potential to need to revisit the criteria and realign it based on how the indicators discussion unfolds • which jurisdiction has precedence? • Provincial governments- how to make sure they apply-- all the relevant in jurisdictions (This why applicable is included • May want to define what we mean applicable? This may be a bit too broad...should this be narrowed down to environmental regulations. • Depending on how international law is interpreted this could change significantly (i.e. FDA viewpoint on use of chemicals in other countries). • A majority of the international law are food health and safety, and this is not

		<p>that...</p> <ul style="list-style-type: none"> • local, national and int'l legal requirements provides a global perspectives on differences between regulation in different regions • How do we actually monitor this? • Proposal to strike principle 1 because legal compliance is a minimum criteria and should be compulsory for all farms – certification goes beyond this • How do we describe international laws? What falls under this principle • Could be made more specific to specify international and national laws applicable to aquaculture • More general wildlife laws that would impact aquaculture • Difficult to make it general because interpretation by different people will lead to different laws being considered necessary to follow • International laws don't necessarily exist, each country writes its own laws and differences between national laws mean different performance levels • How do laws that regulate imports impact this and how do EU laws fit in here? • Interpreted as siting a permit requirement, not all laws that impact aquaculture (eg marine mammal act) • Time scale and sites vs. companies. Eg marine harvest has 200 sites and 10 sites are in breach of law, what is in and out of compliance • Compliance with other criteria should help meet legal requirements too
<p>P2: Conserve natural habitat, local biodiversity and ecosystem function</p>	<p>Proposed edit 2.1 Benthic effects (move biodiversity to indicator level)</p> <p>Proposed edit 2.1: add “of the operation”</p> <p>Proposed edit 2.2: “water quality</p>	<ul style="list-style-type: none"> • For 2.1, what do you use as a baseline, a control site? • For 2.1, need research to determine what indicators we need, may need to be site specific. Chemicals effect on benthos should • 2.2 and 2.3 might be overlapping. Need to clarify what is “near”. • 2.1 the comment is related to incorporate certain qualifiers or impact ideas (near or far field) just as it is on 2.2. It is recognized that the main impact of salmon farming is underneath the cages so the benthic impacts and effects on biodiversity could not be measured in that specific point. For 2.2, are far field effects and effects on maerl beds covered?

	<p>impacts of the operation” in order to account for broader geographical scale impacts</p> <p>Proposed edit 2.5 Interaction with wildlife (remove mentions biodiversity and predators)</p> <p>Proposed edit 2.5: split into two criteria: Effects on wildlife, and , impacts on biodiversity</p> <p>Proposed edit 2.5: “interaction” isn’t appropriate term and should be changed</p> <p>Proposed edit 2.5: add in term “habitat”</p> <p>Note and fix typo(no 2.6).</p>	<ul style="list-style-type: none"> • For 2.4, debate as to whether terms “critical” and “sensitive” below at criteria or indicator level. The critical and sensitive part seems like it should come in at the indicator level instead? These terms need definition. • 2.4 how will the lakes and fresh water open cage system operations be controlled, it is seen that specific indicator in those fragile ecosystems would be interesting to develop. • 2.5 the interaction between predators (seals, sea lions, birds) can be very difficult and need to have at certain specific point ways of control that can be allowed or possible to develop. Companies have to have management control systems but sometimes besides this control the intervention and removal of specific individuals is imposible to avoid. How the indicator can be developed? • For 2.7, indicator level cumulative impacts should look at appropriate siting in terms of 1 farm, multiple farms and multiple use areas. A regional or local management plan would be needed. How do you certify by site for cumulative impacts? Role for this criteria will need to be clearly and justifiably explained • It is very hard to discuss these criteria effectively without indicators. These are very context oriented criteria. • “near site” needs to be defined. Still, interference from neighboring farms and currents needs to be included in this definition. • It is problematic in judging by site when currents and other factors may influence the data of some sites. Example: a good-practice site may be down current from a bad-practice farm. • Indicator suggestions: waste stream or discharges from land based activities, land use itself, copper flaking, etc. • What about on-land effects? Should we be talking about infrastructure impacts at the indicator level? • All the biodiversity criteria is focused in 2.1 • Can’t measure interaction with biodiversity in 2.5 – Is this covering non benthic biodiversity • Interaction could be included at the beginning of them all – perhaps take out
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	<p>Proposed new criteria: Coordinated management of global data and transparency</p>	<p>interaction with</p> <ul style="list-style-type: none"> • Some of these are repetitive and some would be difficult to measure • 2.2 and 2.3 are very linked but might be a difference between marine/ fresh difference
<p>P3: Protect the health and genetic integrity of wild populations</p>	<p>Proposal for 3.1-3.3 to remove “introduced” and “introduction”</p> <p>Proposed edit to 3.1: remove “amplified” and move it to be a separate criteria under P5.</p> <p>Proposed edit to 3.2: Introduction of nonnative species and strains</p> <p>Proposed edit to 3.2: move to P2</p> <p>Proposed edit to 3.4: Breaches of containment</p> <p>Proposed edit to 3.5: Interaction with wild fish populations/runs (remove</p>	<ul style="list-style-type: none"> • Proposal for 3.1-3.3 to remove “introduced” and “introduction” at the criteria level because it is too prescriptive and there are broader issues related to all of these and especially transgenics that should be covered at the indicator level or lower • For 3.1 Amplified above what? Have to be measured “in farm”. What is an introduced pathogen when we do not know what’s existing in the nature around the farm? • For 3.2: This could belong in here, but we need to see the indicators to determine how much this belongs. There are a couple different ends points...where are we going here. As far as environmental risk, is nonnative really worse than farming natives? As such, should a standard focus on this? The case for BC would suggest that farming natives may be worse as feral, non-native populations have not been established –not be the case for Chile.Hard to say if this belongs without an indicator or standard following. Do we care if it is non-native without having more information? Do we care if it’s non-native if it’s farmed in closed systems? Or tilapia introduced if it can’t survive. Or is this in criteria 3.5 • FAO Technical Guidelines for Responsible Fisheries, 2000—introductions for aquaculture should be considered purposeful release into the wild • For 3.2 and 3.3, Is this only covering “new” nonnative species or is it also retroactive? Valid to have the criteria, but might need better definition of “nonnative”. Does this mean all salmon in Chile? How will this be applied and how will the indicator of impact be developed? • If 3.2 and 3.3 view introductions retroactively, will the standard apply to all

	<p>term salmonid)</p> <p>Proposed edit to 3.5: remove term “runs”</p> <p>Proposed new criteria:</p> <ul style="list-style-type: none"> • Monitoring genetic diversity and integrity in wild populations • Genetic impact (and then some of these can be reorganized (For instance 3.2 and 3.3 could be included as sub-points under 3.4 because they are both a consequence of escapes) • Physical siting impacts (e.g.. shading from farms killing eelgrass; hydrodynamic effects of cage siting such as cement tanks in the water) 	<p>farms in a company or will a farm that did not exist before be judged retroactively.</p> <ul style="list-style-type: none"> • For 3.3, take into account domestication • For 3.3, From a consumer point of view, this may really harm the label if you allow this. But, from an environmental perspective, not sure of all the issues or if there are significant issues. • For 3.3, suggestion for an indicator that transgenic species aren’t allowed Include triploids in here? Benefits because they’re sterile – could be an animal welfare issue – do we need an animal welfare standard. Define transgenic – some define transgenic as moving genes from one species to another others as any genetic manipulation • Regarding 3.4, We should not be using escapes as a proxy for genetic integrity – there needs be a criteria to actually measure genetic diversity – which means there actually needs to be genetic testing at the indicator level or lower. • 3.4 the escapes concept will be covered by law in all countries? The idea is that policy to avoid escapes must exist, zero tolerance is not a way to go, but to have a strategie controlled to avoid them. • For 3.4, Trickle loss/leakage may be worse than massive escapes from an ecological perspectives. Look at inventory monitoring/reconciling...volumetric counting when hatchery fish are delivered. Can usually get to 1% in inventory calculating - measurement error. Error in counting could be 0.5%.Since the impact would vary by location (and the health of the wild populations there), we defer to the precautionary principle here. Standard would be statistically not different zero. • For 3.4, possible standard – 0 escapes-can be achieved through tagging. Indicator--% of farmed salmon in wild stock, standard no more than 5%. Does this fall under cumulative impacts again? How would we control for neighbor’s escapes in the river. Indicator could be a certification of pens and facilities to prevent escapes – these certifications require technical standards. Needs to include smolt production sites (same standard as growout
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		<p>operations?)</p> <ul style="list-style-type: none"> • Indicators for these criteria might cover more than one thing?? • Chemicals is no longer reflected under this principle • Add something about selective breeding affecting genetic drift in the wild. • Following up on that, goal is that you don't want to impose genetic impacts on the wild species (segregation of gene pools) – these are goals, how to get there should not be proscriptive- 3.2 and 3.3 could be cut and included under this/ be subpoints of 3.4 • For 3.5, review criteria to ensure that interactions with other species (non-salmonids) are covered in other Principles and Criteria and not falling through the cracks.
<p>P4: Use resources in an environmentally efficient and responsible manner</p>	<p>Proposed edit: delete 4.1 because believed to duplicate 4.2</p> <p>Proposed edit 4.3 Source of non-marine raw materials in feed (broaden from vegetable to all non-marine)</p> <p>Proposed edit: combine 4.2 and 4.3 to ensure all sources raw material considered</p> <p>Proposed edit to 4.4: change to non-biological “inputs” rather than “wastes” (note, this changes meaning, came from Petter’s group)</p>	<ul style="list-style-type: none"> • Is this a cross cutting issue across Dialogues? We can't have double standards between dialogues. • 4.2 the indicator would be to have the resource coming from a sustainable fishery. Use of trimmings should also be included as an indicator • Does 4.3 cover GMO's? We do want to make sure it does at the indicator level. What does that mean for threatened habitats where non-GM feed is grown? • 4.4 recycling, it is with overlap with 5.5 develop indicators that have aspects of biosecurity for certain aspects. (Note that this may be misinterpretation) • 4.5 Carbon footprint is a huge subject, how much of the carbon footprint can be controlled/ measured on farm level? Better to focus on “fuel efficiency” etc. • Should we say life cycle assessment not carbon footprint since there are other energy sources that are not carbon based? • In 4.6, define “non-therapeutic chemical”. Clarification of 4.6 net treatment, sterilization treatments – anything not meant for health and welfare of fish • concern about excess vegetable matter (e.g. soy) in the marine environment and their components, e.g. phyto-estrogen etc. If your feed fish is not sustainable does that make your entire product unsustainable? Shouldn't we be raising fish for feed so we don't deplete wild fish and we don't have to feed carnivores soy?

	<p>Proposal to change [4.5 Carbon footprint] to LCA</p> <p>Proposed new criteria:</p> <ul style="list-style-type: none"> • Coordinated management of global data • Policy for abandoning sites • Assure size of site has relation to what is going to be done (Rodrigo's group, needs clarification) • Water footprint 	
<p>P5: Manage disease and parasites in an environmentally responsible manner</p>	<p>Proposal to move [5.2 Contamination levels and health effects in local non-target organisms] to fall under P2.</p> <p>Proposed edit to 5.3: therapeutic treatments</p> <p>Proposed edit 5.4: remove term "virus"</p>	<ul style="list-style-type: none"> • There seems to be an overlap with criteria of Principle 2 • Will there be different indicators for different chemicals and species? • There was some discussion about survival and health as terminology. • It is unclear what 5.2 is trying measure. How can the data be attributed to a specific farm? • For 5.3, are we looking at fate in the marine environment? • 5.4 How do you measure the resistance of a virus? Viruses mutate while bacteria gain resistances. • 5.5 What about blood water from processing plants, gear, well boats? Other discharges? • Need to capture elements that help to avoid disease (before use of chemicals) • Does this principle already assume the fish are sick? Or does it include prevention or promotion of fish health? • Should things like fallowing, stress reduction, etc be a criteria or under criteria 5.5 or 5.1?

<p>Proposed edit 5.5: remove term “pathogenic”</p> <p>Proposed edit to 5.5: remove “and hygiene”</p> <p>Proposed new criteria:</p> <ul style="list-style-type: none"> • Risk of transmission from wild to farmed and farmed to wild • Coordinated management of global data • Biological control of species and pests • Broodstock biosecurity and fish movement • Amplified parasites and pathogens (moved from 3.1, Trygve’s group). • Prevention before treatment (include list of preventative measures as BMP standard) • Administration of chemicals (dosing, feed vs injection) • Data collection – public transparency of site specific data. 	<ul style="list-style-type: none"> • Should criteria 5.5 really be an indicator under 5.1 (and then fallowing would be part of a standard under biosecurity, etc.) • Regarding 5.1 <ul style="list-style-type: none"> ○ Is survival of farmed fish really an ecological criteria – would it necessarily be linked to an ecological impact (i.e. jellys and algal blooms occurring naturally and non-related to farming would kill off all your fish – but this has nothing to do with ecological impact)? ○ Question whether “survival” should be included. If indicator is something like “chronic” morts or persistently significant morts, than keeping survival in here makes sense (gets to ecological impacts versus just farmed fish health). It also makes sense to keep in survival, since morts is one of the few areas for which data can be accurately collected so it makes sense to make use of this available data. ○ This is very sensitive to how you define health, disease, etc. ○ Could include requirements in year class separation, fallowing, stress ○ But indicators of health of farmed fish could be things like growth rates, morts, etc. • Regarding 5.2, this shouldn’t relate to all contamination, but contamination related to disease/parasite treatments on farms • Regarding 5.3: consider inclusion of biological treatments since all aren’t benign (e.g. virus to kill sea lice). Also could have encouragement of use of biological means before treatment. • For 5.3, some discussion as to whether the appropriate standards for antibiotic use should be 0, since half of Scottish farms could meet this based on reported data, and potentially more could meet it in Norway. But if a farm needed antibiotics in an emergency situation (not persistent use) would this be OK or would they lose the label? • For 5.4, an indicator could be dose response. It can be measured over time. Also could require no persistent use, or alternated use, to minimize risk of resistance developing. • For 5.5, concern that indicators become too prescriptive. Or use of HACCP principles could be a potential indicator
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<p>P6: Develop and operate farms in a socially responsible manner</p>	<p>Proposed edit 6.5 Health and safety <i>of workers</i></p> <p>Proposed new criteria:</p> <ul style="list-style-type: none"> • Social and community support (farms supporting the community). • Food safety and quality • Training 	<ul style="list-style-type: none"> • 6.1, concern about advocating for unions or the language around collective bargaining • 6.5 – we are assuming this covers the consumer, the workers and the community near the farm – if not it should • Define the scope of 6.5 and link criteria 6.7 with 6.5. It should be defined whether sub-contracted workers are included. • Proposed criteria “Training” should address health and safety as well as other areas of training. Companies should need to educate workers on health and safety. • Proposed new criteria “Social and community support” is designed to address areas where farms are being put in the water in areas where there is no community structure – should be looking at availability of schools, medical facilities, etc. • Could also look at the Helsinki accords which everyone is likely adhering to. • A lot of the labor issues will have to be addressed at processing and other levels as well.
<p>P7: Be a good neighbor and conscientious citizen</p>	<p>Proposed edit to 7.1: Interaction with and impacts on local communities and other resource users</p> <p>Proposed edit to 7.1: change “other resource users” to “other stakeholders”</p> <p>Proposed edit to 7.2: change “indigenous and aboriginal” to “other stakeholders”</p>	<ul style="list-style-type: none"> • We want information sharing and transparency of global data across all the impact areas – part of being a conscientious citizen is doing that. Harmonized data collection was advocated by the scientists and we need to make sure it is addressed by the dialogue – might be better to put this under each principle • Should visual impact be covered here at the indicator level (use of lights esp. subsurface, colors?) • Be a good neighbor to other marine users and other farms. • Respect other peoples property. • Transparency • Where it states “relevant impacts”, change to say socioeconomic rather than social. • For 7.1 one indicator could be development of human capital • Define “Interaction” in 7.1

	<p>Proposed new criteria:</p> <ul style="list-style-type: none"> • Coordinated collection and management of global data • Offer job opportunities to the local community • Accrual of benefit to local communities and regions 	<ul style="list-style-type: none"> • The local communities are not always the source of employment in company farms. How will worker sourcing effect these criteria? • 7.1 “Interaction” should also include improving the local community’s quality of life. • Possible indicator could be a percentage of income contributed to the local community. • Indicators need to be something measurable and take the difference between regions under consideration. • Consider highlighting local fishermen under local users.
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