Monterey Bay Aquarium®

Seafood Watch Aquaculture Technical Advisory Committee Meeting
Meeting Summary

22-23 May 2019
Monterey Bay Aquarium, Bing Board Room
886 Cannery Row
Monterey, CA 93940

Contents

Preamble

Seafood Watch assesses the environmental sustainability of fisheries and aquaculture by compiling relevant science-based information and evaluating that information against our standards (called 'Criteria' elsewhere on this website). We periodically revise our standards to ensure we account for developments in the scientific understanding of the ecological impacts of fisheries and aquaculture operations, as well as in our understanding of what producers and managers can do to mitigate those impacts. On May 22-23, 2019, we held a meeting with our Aquaculture Technical Advisory Committee (TAC) to discuss emerging issues, proposals for changes, and suggestions received during our public comment period held from March 4 until May 3, 2019. The role of the TAC is to provide scientific expertise and advice; it is not

a decision-making body, but advice from the TAC was given serious consideration in developing the second draft of our criteria. The meeting notes below represent a brief synopsis of the discussions held during this two-day meeting.

Meeting Objectives

1. Understand the aim of Seafood Watch and the role of the Aquaculture TAC
2. Discuss, and contribute to the resolution of, the topics considered for review or improvement in the SFW Aquaculture Standard

Participants

Name	Affiliation
Rick Barrows	USDA
Dave Bengtson	University of Rhode Island
Ram Bhujel	Asian Institute of Technology
Peter Bridson	Seagreen Research
Thierry Chopin	University of New Brunswick
Kevin Fitzsimmons	University of Arizona
Dane Klinger	Conservation International
Michèle Stark	Seafood Advisory Ltd.
Kathrin Steinberg	Aquaculture Stewardship Council
Albert Tacon	AquaHana LLC
Alfredo Tello	Camanchaca
Harry Yuli	PT ATINA
Cormac O'Sullivan	SGS - Ireland
Gill Banner-Stevens	Fishwise Limited, UK
Tyler Isaac	Seafood Watch
Tori Spence McConnell	Seafood Watch
Taylor Voorhees	Seafood Watch
Wendy Norden	Seafood Watch
Santi Roberts	Seafood Watch
Corey Peet (Facilitator)	Postelsia

Opening Statements

As an opening to the meeting, several presentations were given which outlined the current activities and relevance of the Seafood Watch program, as well as several initiatives informed by the foundational standard at the core of the program. Additional presentations outlined the standard review process and timeline, as well as each of the public comments received during the first public comment period.

Each member was asked to describe their view of sustainable aquaculture to help set the stage for the rest of the discussions in the meeting. While recognizing that the Seafood Watch standards currently focus only on environmental performance, several members highlighted the importance of social and economic value when considering the overall impact of an industry, as well as the significance of engaging with all stakeholders for an integrated and holistic view forward.

Sustainable Aquaculture and the Precautionary Principle

Aquaculture sustainability: where do theory and reality intersect, and how should that point influence a 'full score' *and* a representation of 'Green'?

There are several concepts of sustainability, two of which are strong sustainability (i.e. use that does not constrain future use choices or capabilities) and weak sustainability (i.e. use that can continue indefinitely in its current form). The Seafood Watch Aquaculture Standard currently relies on a definition of strong sustainability to drive the foundation of assessments:

"Seafood from sources, whether fished or farmed, that can maintain or increase production without jeopardizing the structure and function of affected ecosystems."

This, paired with the reliance on a common sense approach to the use of the precautionary principle can pit the concepts of "zero impact" or "zero risk" against the realities of farms operating in an environment.

The conversation centered around the idea of "zero impact" and "zero risk" and whether it is reasonable to hold reality to a theoretical standard. There was agreement that these concepts of "zero impact" or "zero risk" are important theoretical targets but not practical for the realities of production. Several comparisons between allowable/acceptable impacts in fisheries with the same impacts in aquaculture deemed unacceptable bring this question to light. Ultimately, the use of resources and the waste and efficiency concept should be forefront in the theory of assessment.

The TAC members highlighted the importance of having accurate reference points throughout the scales of assessment, not just for a 'full score'. However, it was noted that this is inherently difficult for aquaculture given that very few reference points exist (as opposed to wild capture, where there are more with some level of scientific consensus). Any farm will undoubtedly present a change to the ecosystem in which it operates, however in order to assess that change the standard should keep it within the context of ecological relevance.

Scope and Scale

How should an industry's scale contribute to the evaluation of its sustainability?

Throughout the Seafood Watch Aquaculture Standard, the impacts or potential impacts of aquaculture production are considered on both a per-ton-of-production and cumulative industry basis. However, there is no direct relationship between the scale of an industry and the determination of its ecological sustainability.

For example, a region may feature net pen production of two species, and due to biological differences between the fish, the per-ton-of-production discharge of nitrogen is higher for one species and results in a lower score (in comparison to the other species) for Criterion 2 – Effluent. If the scale of production for the more efficient species (on a per ton discharge of nitrogen basis) is significantly larger than that of the less efficient species, the total discharge of nitrogen may also be significantly larger for that species. How should a scenario like this be handled?

- This topic generated considerable discussion without a clear suggestion forward. It was generally agreed that incorporating scale is important in an assessment, but the scale of impact (and not the industry) is the major factor to consider. Challenges include obtaining sufficient data regarding impacts and carrying capacity in order to allocate relative impacts, as well as maintaining up-to-date information regarding any changes to production scale. It appeared that more clearly defining the unit of assessment would be beneficial.

Polyculture

How should Seafood Watch incorporate more specific guidelines and measures to evaluate the ecological impacts of polyculture operations?

While the intent is for the standard to be applicable to all species, all production systems and any location globally, we have found that the current structure and metrics of the standard are best suited to single-species assessments. The multi-species integration of polyculture systems offer unique ecological dynamics and are challenging to assess with the current version of the standard. Seafood Watch recognizes that polyculture systems are ubiquitous throughout the globe and that seafood items produced in polyculture systems are likely entering the US market.

Conversation on this topic centered around the vast scope of systems that could be considered a kind of polyculture system, as well as the constraints of the current standard. As of the date of the meeting, there are two specific reports currently being drafted that could incorporate polyculture in some fashion. In order to facilitate a more targeted discussion, Seafood Watch can produce one of those reports as a test case for how the standard currently handles a multispecies system, and this test case would be circulated to the TAC for comments. Comments from the TAC will ideally help shape any decisions to incorporate further clarification or further distinction for polyculture systems within the standard.

Habitat

When considering the habitat effects of a farm, what are the bounds/definition for the "habitat"? Should Seafood Watch consider the impact to the area directly within the perimeter of a/the farm, or to the broader habitat in which the farm(s) are sited?

The definition of 'habitat' in this criterion is largely restricted to an allowable zone of effect around/under a given physical farm boundary (e.g. within 30 meters of a net pen, or within the immediate perimeter of a pond). However, this definition of 'habitat' may not adequately account for either the broader impact of regional habitat fragmentation (e.g. in regions where industry actors operate in close proximity, as in

typical pond production in Southeast Asia), or potential preservation of broader habitat functionality and ecosystem services (e.g. in regions where industry actors operate distally, as in some pond production industries in North America).

Comments from the TAC touched on the importance of governance in determining the significance of an impact and also the value of focusing on the broader impact, within the context of the health of the ecosystem in question. The conversation centered around the current flexibility of the Seafood Watch standard and the allowance for several interpretations of the "habitat" impacted by a farm or an industry. Ultimately, this flexibility in interpretation allows for decisions to be made on a case-by-case basis and as long as the determination for the definition of the "habitat" is clearly justified, then utilizing a less prescriptive approach allows for a more appropriate determination of the affected habitat for each industry.

Chemicals

What metrics/factors are we missing for determining chemical use risk?

- Seafood Watch should be more specific regarding what constitutes a "treatment", which is not explicitly defined in the Standard currently. A single application of a drug is considered one treatment, unless specified in a veterinary prescription that one treatment would be several applications over a period of time.
- It would be useful to have specific guidance on different drugs and systems and conditions (e.g. a separate table in the Standard) which may better articulate "significant" use and risk of impacts in a context-appropriate way.
- Seafood Watch should ensure that our scoring system sends the appropriate signal and incentive to producers, so we are not incentivizing shifting impacts (e.g. moving a farm to a more pristine area to lower the need for ABX usage, or switching to a more potent antibiotic to lower total volume of ABX usage).

Feed

How do we best balance the importance between the amount of an ingredient that is used and sustainability factors for the source of that ingredient?

The sustainability of the source fishery is a basic assessment that uses commonly available metrics that avoid the need for an independent fishery assessment. It applies an increasingly negative adjustment to the wild fish use score (Factor 5.1a) corresponding to an increasingly unsustainable source fishery. In this way, Seafood Watch takes the position that using sustainable sources of fishmeal and oil should be the minimum acceptable baseline, and a penalty is applied for unsustainable sources.

However, the current calculation for Factor 5.1 – Wild Fish Use (using the FFER value, the corresponding FFER score, and the Source Fishery Sustainability Score) is such that significant differences in source fishery sustainability often do not result in significant changes to the overall score of Factor 5.1. For example, assuming FM (20%), FO (3%) and eFCR (1.5) are held constant, a source fishery score of -2 (MSC certified with minor conditions) yields a 5.1 score of 6.13 (Yellow), while a source fishery score of -10

(unknown source fishery) yields a 5.1 score of 4.00 (Yellow). Seafood Watch is seeking ways to improve the incorporation of sustainability of the source fishery into the Feed Criterion calculations.

- The source sustainability is more important than the total use of FM and FO, though there was not a suggested weighting given.
- Automatically penalizing the use of FM and FO regardless of source sustainability was discussed.
- If a source fishery is SFW Red rated, the Feed Criterion should automatically be Red.
- Move the Fishsource scores out of the -8 and -10 scores for 5.1b.
- Seafood Watch should assess the sustainability of byproducts, but be mindful of the incentive we want to give. Byproducts should be scored differently than primary product.

How can we comparatively assess the sustainability of alternative ingredients and more comprehensively assess crop-based ingredients?

Traditionally, aquafeed formulations for growout include marine ingredients in the form of fishmeal and fish oil, as well as ingredients from crop and animal agriculture. Alternatives to these ingredients, such as insect meal, single-cell proteins, algae oils, and others, are rapidly reaching commercial production scale and beginning to be incorporated into aquafeeds. The current Feed Criterion does not directly incorporate these alternative ingredients into the scoring, as there is not a mechanism by which to assess them on a comparative basis with the traditional ingredients listed.

- Read the ASC feed standard to learn how they are assessing crop ingredients.
- Bring this question to an expert working group, like ASC.
- Carbon equivalents are a potential method, but we need to ensure we have the appropriate data and are fully justified in incorporating CO_2-eq into only one criterion.
- Look into other available LCA indicators to align with our mission, “Conservation of the Ocean”, but again ensure appropriate data and justification for inclusion.

What is an “appropriate” use of harvested by-products?

- Some attendees felt that the calculation should only consider by-products used in nutrition (e.g. not wallets or cosmetics), yet others felt that any use of harvested by-products should be valued higher than no usage.
- Considering the different end-uses with different values (e.g. higher for nutrition) makes data collection very difficult and this to be very complex.
- Assumption of percent of by-products utilized can vary by species and cultural preference, so be sure to consider this when making an assumption value in the absence of data.

Source of Stock

Should Seafood Watch expand the scope of Criterion 8X to include broader impacts of fishing for farm stock beyond the stock status, such as bycatch and other considerations?

Where a wild fishery is used for providing broodstock or juveniles to an aquaculture industry, the sustainability assessment for that fishery is limited only to the stock status for the target fishery. This could, however, ignore other impacts of the fishery (e.g. bycatch), as well as the legality of the fishery,

and these limitations may obscure unsustainable practices in a fishery that aquaculture production is reliant upon. TAC members indicated that it would be worth performing a quick pilot test to see how many assessments modifying this criterion would affect. Additionally, they indicated it would be good to compare with fisheries assessments to gain a better understanding of relative impact from that perspective. The current language in the standard refers to the wild fish source sustainability table in the Feed criterion, but this could be clarified for further guidance in the Source of Stock criterion.

Predator and Wildlife Interactions

Revisiting the scoring table: what *should* be penalized?

This criterion is currently considered exceptional; thus, the presumed impact of most aquaculture production would score at '0' for 'no impact'. However, in evaluating the most common scores employed for this criterion in published Seafood Watch aquaculture assessments, there are few that carry '0' scores, and a vast majority carry a score of '-2'. This indicates typical industry production practice may not be 'no impact'.

To ensure assessment scores are not artificially or unintentionally deflated, participants discussed the distinctions between current standard definitions of a '0' and '-2'. This criterion has existed as a subfactor for the 'Habitat' criterion in previous versions of the standard and several members suggested it be returned to that criterion, as it is one of many factors encompassing the surrounding habitat and ecosystem. There were also comparisons to methods utilized by the fisheries assessment to assign impact value to bycatch of Endangered/Threatened/Protected species, as well as those with stocks that are known to be stable.

Escape of Secondary Species

Do we need to refine the definition of "trans-waterbody movements"?

Criterion 10X addresses the aquaculture operation's dependence on international or trans-waterbody movements of animals (Factor 10Xa) and the biosecurity of both the source and the destination of the species transported during live fish shipments (Factor 10Xb). The standard defines "trans-waterbody movements" as follows:

"Trans-waterbody movements take place when the source waterbody is ecologically distinct from the destination (farming) waterbody, such that the live animal movements represent a risk of introducing non-native species (pathogens, parasites, other secondary species). "

Among Seafood Watch reports, there are sometimes discrepancies in recognizing movements that could be considered "trans-waterbody"; e.g. movements between neighboring, watersheds has been considered "trans-waterbody movement" while in a different report, the an entire country is considered one water body. Both interpretations can be considered accurate given the description, but this question was posed to the TAC to see whether there are further distinctions that can be made. General consensus of the conversation was that the definition should still allow for a range of interpretation to best fit the

industry in question, and that the report should strongly justify any claims about whether two waterbodies are ecologically distinct and the broader ecosystem should be taken into account.

Joint Discussion with Fisheries TAC

The Seafood Watch Fisheries TAC and the Aquaculture TAC held a joint discussion covering two topics that are shared between both standards but may be addressed differently due to inherent differences between the two forms of production:

Scale: How should the scale of an industry contribute to the evaluation of its sustainability?

Input sustainability: For fisheries that use bait, Seafood Watch evaluates the impacts on bait species as a main species. For aquaculture, assessment of wild fish products (fish meal and fish oil) is incorporated into the feed criterion and the overall weighting of the sustainability of the source is one of many factors contributing to the assessment of that input.

While the majority of the discussion revolved around input sustainability in comparison between the two standards, the question of scale was apparent within the understanding of the importance of sustainability in the inputs for either industry. Many TAC members indicated that coordination between both standards on these similar issues would be useful, however only where appropriate. For instance, several aspects of the scoring guide in the feed criterion can be useful for further development in how the fisheries standard handles bait use. This guide can also be updated in the aquaculture standard to incorporate more aspects relevant to the fisheries standard.

Action items and future steps

- Scope and scale: look into more clearly defining the unit of assessment
- Chemicals: build a guidance table that can be inserted into this criterion
- Feed: determine an appropriate weighting for source fish sustainability
- Feed: Read the ASC feed standard to learn how they are assessing crop ingredients. Bring this question to an expert working group.
- Feed: Look into other available LCA indicators to align with our mission, “Conservation of the Ocean”, but again ensure appropriate data and justification for inclusion
- Insert clarifying guidance: habitat boundaries, definition of a single treatment for chemicals, accepted uses for harvested byproducts, sustainability of the source of stock, trans-waterbody movements.
- Polyculture: produce a test case that the TAC can review

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Appendix I: Seafood Watch Aquaculture Technical Advisory Committee Meeting Agenda

22-23 May 2019
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Meeting Objectives

1. Understand the aim of Seafood Watch and the role of the Aquaculture TAC
2. Discuss, and contribute to the resolution of, the topics considered for review or improvement in the SFW Aquaculture Standard

Day 1 (22 May 2019)

07:50 – 08:30	• Meet in Lobby of the Clement Hotel • Walk to the Aquarium • Breakfast served in the Bing Board Room (starting at 8 am)
08:30 – 8:40	**Welcome, Review Agenda, Logistics and Ground Rules** *Corey Peet – Facilitator*
08:40 – 08:55	**Presentation**: Overview of the SFW Program and Future Directions *Wendy Norden – Seafood Watch Science Director*
08:55 – 09:05	**Introduction of a challenge:** What is 'sustainable aquaculture'?
09:05 – 9:45	**Introduction of Technical Advisory Committee members** • Brief self-introduction of TAC members • What is *your* definition of 'Green' aquaculture? Zero-impact or 'MSI'?
09:45 – 9:55	**Presentation**: Overview of the Standard review process & understanding the role of the SFW Aquaculture TAC *Santi Roberts – Seafood Watch Senior Science Manager*

09:55 – 10:15	**Presentation:** The Seafood Watch Aquaculture Standard: Topics for discussion and summary of public comments received *Tori Spence McConnell – Senior Aquaculture Scientist*
10:15 – 10:30	Group Photo and *Coffee Break*
10:30 – 11:30	**Sustainable Aquaculture and the Precautionary Principle:** Aquaculture sustainability: where do theory and reality intersect, and how should that point influence a 'full score' *and* a representation of 'Green'? *Taylor Voorhees– Senior Aquaculture Scientist*
11:30 – 12:30	**Scope and Scale:** How should an industry's scale contribute to the evaluation of its sustainability? *Taylor Voorhees– Senior Aquaculture Scientist*
12:30 – 13:30	*Lunch*
13:30 – 14:30	**Revisit of aquaculture sustainability and scale considerations**
14:30 – 15:15	**Getting specific… (Round 1)** • C3: Interpretation of "affected habitat" • C4: What metrics/factors are we missing for determining chemical use risk? • C9X: Revisiting the scoring table: what *should* be penalized?
15:15 – 15:30	*Coffee Break*
15:30 – 16:30	**Joint discussion with Fisheries TAC:** Compare and contrast fisheries and aquaculture sustainability regarding: • **Scale:** How should the scale of an industry contribute to the evaluation of its sustainability? • **Input sustainability:** Feed for aquaculture, bait use for capture fisheries
16:30 – 17:15	Summary of Day 1 and Meeting Wrap
18:00	*Dinner with the Fisheries TAC in the Aquarium's Open Sea Exhibit*

Day 2 (23 May 2019)

08:00 – 8:30	*Breakfast (provided)*
08:30 – 8:45	**Presentation:** Review of Day 1 and Overview of Day 2 *Corey Peet – Facilitator*

08:45 – 10:30	**Feed:** Balancing the importance between how much is used and where it comes from *Tyler Isaac– Senior Aquaculture Scientist*
10:30 – 10:45	*Coffee Break*
10:45 – 12:30	**Feed:** How can we comparatively assess the sustainability of alternative ingredients and more comprehensively assess crop-based ingredients? *Tyler Isaac– Senior Aquaculture Scientist*
12:30 – 13:15	*Lunch*
13:15 – 15:15	**Polyculture:** It's complicated: how should multi-species systems be assessed? *Tori Spence McConnell – Senior Aquaculture Scientist*
15:15-15:30	*Coffee Break*
15:30 – 16:45	**Getting specific… (Round 2)** • C5: What is an "appropriate" use of harvested by-products? • C8X: Determining the scope of brood/farmstock sourcing sustainability • C10X: Definition of "trans-waterbody movements"
16:45 – 17:30	**Closing Session** • Recap of meeting outcomes • Additional feedback and thoughts from TAC members • Outline of 'what's next…'
18:00	*Dinner at Hula's*