



## **Best Aquaculture Practices Certification Program**

Global Aquaculture Alliance

5661 Telegraph Road, Suite 3A • St. Louis, Missouri 63129 USA

Phone: +1-314-293-5500 • Fax: +1-314-293-5525 • Web: [www.gaalliance.org/bap/](http://www.gaalliance.org/bap/)

# **Comments on BAP Standards**

## **Finfish and Crustacean Standards**

*Comments concluded January 2013*

### **New England Aquarium**

Matthew Thompson, Michael Eppling

Boston, Massachusetts, USA

#### **PREAMBLE:**

These comments are provided by the New England Aquarium to the Global Aquaculture Alliance on the Best Aquaculture Practices Certification Standards, Guidelines Draft Finfish and Crustacean Farms standards. Founded in 1969, the New England Aquarium is a global leader in ocean exploration and marine conservation and is committed to building awareness and finding innovative solutions through our marine conservation and research initiatives. The Aquarium's Sustainable Seafood Advisory Services aims to foster long-term sustainability of seafood resources and their supporting ecosystems by raising public awareness and working with the seafood industry to promote certification and best practices within wild-capture fisheries and aquaculture operations.

We appreciate the opportunity to review and comment on these draft standards. These comments should not be considered an endorsement of the Global Aquaculture Alliance or its standards; neither should the suggestions made be considered conditions to obtain that endorsement. The Aquarium recognizes the challenges and potential benefits of certification schemes, especially in regard to aquaculture production, and often offers comments and suggestions. These comments are presented from a general perspective and are not prescriptive. Limits set for standards should be defined by technical committees using balanced participation by independent technical experts and by appropriate representatives of interested parties, including, but not limited to NGOs, and representatives of the aquaculture industry.

#### **GENERAL COMMENTS:**

The Aquarium recognizes this most recent evolution of the GAA's scheme as another improvement in the BAP program, highlighting the inclusion of environmental criteria such as fish in:fish out (FIFO) metrics in this most recent draft. We also recognize the cost efficiencies associated with a universal standard, though we also acknowledge the challenges with the one-size-fits-all approach, such as standards that require careful wording so that the appropriate issues are addressed and that all producer types are considered appropriately.

Given the multi-species nature of these standards, we believe the standard-setting process for this standard revision would be enhanced through the use of multi-stakeholder technical committees that include relevant producer representation, such as representatives from the farmed shrimp, tilapia, and *Pangasius* industries.

A social technical committee could enhance the criteria in standard 3. Consistency with the fishmeal and fish oil conservation requirements in the GAA BAP feed mill standards should also be a priority; the feed mill technical committee should be reengaged to revise these criteria for the universal draft and the feed mill standard, and should also consider setting further limits to other feed ingredients, such as soy.

**BAP:** *These are important points that will be considered by the Standards Oversight Committee in upcoming meetings. In general, there is a balance to be struck between creating standards that are on the one hand workable, cost-effective and feasible for smaller producers, and on the other hand, more stringent, complex, prescriptive, metrics-based and suited only to larger ventures.*

*These recommendations from NEAQ mostly pull the standards in the latter direction, but they also note (in compliance with FAO Guidelines) that the needs of small-scale producers should also be addressed. The BAP standards are a genuine attempt to get this balance right and reflect a standards development process that builds in improvements over time.*

Difficulties setting general standards for aquaculture operations may be particularly evident for small-scale or low-intensity/extensive producers. The importance of protecting the interests of small-scale farmers is highlighted in the Food and Agriculture Organization of the United Nations (FAO) “Technical Guidelines on Aquaculture Certification” (referred to as the FAO guidelines within this document), which state that schemes “should ensure special considerations are provided to address

the interests of resource- poor small-scale farmers, especially the financial costs and benefits of

participation, without compromising food safety.” We feel the draft needs to give greater attention and flexibility for these groups. Will the Integrated Operating Module (IOM) system be applied to this standard?

**BAP:** *Yes, and a BAP cluster program (now approaching completion) will be applicable to small operations.*

A key opportunity that is, in our opinion, underutilized in the draft is area management agreements (AMAs). Currently only required for (and somewhat misplaced in) section 7, sediment control for marine cages, AMAs offer the potential to address wider issues such as cumulative environmental impacts and biosecurity, in particular. They also offer mutual benefits to the farmer, the environment, and the supply chain, since fewer disease outbreaks mean a more consistent supply.

AMAs, with some language adjustments, should be applied to all production types and species, including pond systems. The types of requirements could include contractual use of Specific Pathogen Free (SPF) postlarvae (P.L.) in shrimp, and vaccines for diseases like *streptococcus* in tilapia or for bacillary necrosis of Pangasianodon (BNP) in *Pangasius*. Details of BAP consistent AMAs could appear in the biosecurity standard and have specific requirements listed in the species-specific standards.

**BAP:** *Correct. The AMA requirements only apply to marine cage farms at the moment, hence they are in Section 7, which is exclusive to marine cages. This is a good starting point and a significant step in the evolution of this set of BAP farm standards, which has previously been focused exclusively on the management of individual farms. The intention is for the standards to evolve further and include AMA requirements for all production systems in the future after experience is gained with the implementation of AMA requirements for marine cages.*

*In response to this set of comments, a cross reference to the AMA requirements has been added to Standard 15 on biosecurity and to Standard 13 on drug and chemical management.*

The public comment draft is for the guidelines and standards and not the audit checklist, so we are unable to see if, and how, data are captured by the auditors and the GAA, which can be studied later to determine if farm improvements have been made and to set more rigorous or suitable standards when feasible. A relevant example is FIFO values, which have limits for well-established species, but not, for example, for channel catfish, cobia, pompano, etc. In our comments, we identify these areas as needing “informational questions.”

It is unclear if a universal hatchery/broodstock standard is also to be developed; we encourage the GAA to do so. It would also be useful to have a quick reference document to identify the requirements that have been added to or removed from the species-specific standards.

**BAP:** Yes, new, generic hatchery/broodstock/juvenile production standards, to be known as the Seed Production Unit standards, are in an advanced state of development.

To enhance credibility, we believe our comments, as well as those from other parties, should be addressed by the technical committee that formed the standards. A second comment period is requested to review subsequent changes from this first draft.

**BAP:** *This is a possibility that the SOC will shortly address in light of all feedback obtained during the public comment phase and also taking into consideration the extended gestation period of this draft and the urgent need to implement it.*

#### COMMENTS ON SPECIFIC STANDARDS:

##### 1. Community: Property Rights and Regulatory Compliance

Contracts with processing plants are particularly relevant in shrimp farming, and may extend to specific volumes of certified product being sold to processors. Farms may also agree to contractual requirements as part of AMAs or with the local community. The BAP program should ensure that farms are meeting their contractual agreements as part of being a responsible producer and also to protect supply chain commitments.

**BAP:** *Probably beyond the scope of BAP. It's usually the job of a plant to enforce its own contracts.*

##### 2. Community: Community Relations

Add a standard addressing farm appearance and noise/odor prevention, or move the language in the "Reason for Standard" to Standard 11, where the other garbage standards are listed.

**BAP:** *Agreed. This can be resolved by including a cross reference to Standard 11 on page 4:*

*"Farms shall maintain a neat and attractive appearance to avoid becoming an eyesore to local residents. Sanitary measures shall be employed to prevent odors from affecting nearby neighbors (see Standard 11). Machinery shall be maintained in good repair to avoid unnecessary noises that may disturb neighbors."*

2.2 is very loosely worded, creating a difficult standard to audit consistently. We recommend clarifying this standard.

**BAP:** *The auditor does need to know what to look for. The Implementation Guidelines offer some assistance and specify:*

*"During facility inspection, the auditor shall verify compliance with this standard through examination of maps that define public and private zones; inspection of fences, canals and other barriers; and interviews with local people and farm workers. The auditor shall select the individuals for interview. This selection can include, but not be limited to, interviewees provided by farm management."*

*So to comply with 2.2, the applicant has to demonstrate, to the satisfaction of the auditor, that he/she "manages water usage to avoid restricting the amount of water available to other users." And the auditor should be able to detect if water supplies are being monopolized to the detriment of neighbors.*

##### 3. Community: Worker Safety and Employee Relations

The revised social criteria, in our opinion, represent a positive step forward for the BAP program ...

**BAP:** *Agreed. This is an example of how BAP standards meet the need for continuous improvement.*

... but the language and limits used in the standard need to be tightened. Our comments highlight areas where we feel there are weaknesses in the standards, but we highly recommend that the BAP criteria be reviewed and set by organizations specializing in social justice, preferably by an independent social technical committee.

The language used in the standards relies heavily on the presence and acceptability of national laws, and also on auditor judgment. This is a challenge for consistency and may open the possibility of excessive impacts when national laws do not exist. Wherever possible, the GAA should use language, limits, and definitions set by the International Labour Organization (ILO), consistency with which is a requirement of the FAO guidelines. Additional guidance could be found in the Social Accountability 8000: 2008 standard. Further attention is also needed for ...

**BAP:** *Typically, deficiencies arise from weak adherence to existing laws rather than the absence of suitable law, hence the BAP standards start by insisting that existing local laws be fully complied with. Reflecting the need to build on existing laws and the importance of social issues in general, there are now 33 BAP clauses relating to employee conditions and safety, compared to 12 previously. BAP standards tackle the main concerns head-on but they are not intended to duplicate a social audit of the SA 8000 type.*

*The FAO Guidelines require that social standards accord with national law, with guidance from ILO where appropriate. They do not require that ILO conventions be included in standards. Awarding primacy to national laws is an intentional stance of the FAO member countries, many of whom worry that the imposition of international labor standards could act as non-tariff barriers to trade.*

That said, a modification to Clause 3.2 is needed:

3.2: The applicant shall comply with national child labor laws regarding the minimum working age, or the ILO Minimum Age Convention 138, whichever is higher.

... special requirements for small-scale family farms in developing countries relative to larger establishments or those in more developed areas.

**BAP:** *The procedures and requirements for certifying clusters of small-scale producers to BAP are nearing completion.*

Will the auditors be required to have additional professional qualifications, such as SA 8000, to audit to the BAP standards?

**BAP:** *Yes. Qualifications for auditors, which include social, are defined. Additionally, the mandatory BAP Auditor Training Course includes social audit requirements.*

3.2 and 3.3 focus on national laws, but do not set absolute limits. The ILO describes limits for children and young people (see ILO Convention No. 1384). A special case of “light work” could be included for small-scale, family farms only.

**BAP:** *Agreed. Modify 3.2 and 3.3:*

*3.2: The applicant shall comply with national child labor laws regarding the minimum working age, or the ILO Minimum Age Convention 138, whichever is higher.*

*3.3: The employment of young workers (above the minimum age but under 18 years old) shall be in compliance with local laws, including required access to compulsory school attendance and any restrictions on hours and time of day.*

3.5 and 3.6, as worded, infer farms sited in countries with no nationally mandated work week have no limits. The GAA should set a limit in the absence of national or reasonable regulations.

3.8 should include consistency with 3.7, otherwise a loophole may exist.

**BAP:** *Both 3.7 and 3.8 must be complied with, so it's not clear that there is a potential loophole.*

3.9, as worded, may provide an opportunity for farms not to pay workers sufficiently. An alternative would be to require piece workers to receive minimum wage, but then have additional monies paid on the “per-piece” basis. The sentence “where local laws allow exceptions to minimum wage and overtime pay for such workers, the facility shall provide documented proof of such laws and

compliance with them” is confusing. If it means that it is O.K. to pay below national minimum wages based on a local law, then it should be deleted, as it is inconsistent with FAO guideline #565.

**BAP:** *Agreed. Modify 3.9 (now 3.13) by deleting second sentence:*

*3.13: The facility shall maintain all relevant documents that verify piece workers (those paid a fixed "piece rate" for each unit produced or action performed regardless of time) are paid in compliance with local law, including regulations regarding equivalence to or exceeding minimum requirements for wages, hours, overtime and holiday pay.*

3.10 Add the words “and training” at the end of the sentence.

**BAP:** *Agreed. Modify 3.10*

*3.10: The facility shall appoint a management person responsible for ensuring worker health and safety and training.*

3.11 Add the words “and active feedback to address any issues identified.”

3.15 roll into 11.17.

**BAP:** *The separate clauses have different contexts.*

3.16 Add language reflecting the need for “sufficient quantities of safe drinking water should be available.”

**BAP:** *The existing clause feels stronger and includes the phrase “shall be readily available.”*

3.16: Safe drinking water shall be readily available to employees.

3.18 replace “local” with “the eating customs of the workforce.”

3.25 should also require that first aid equipment is not out of its use-by date.

**BAP:** *Agreed.*

*3.25: A first aid kit shall be readily available to employees and any expired contents shall be replaced.*

3.26 Limits for underwater time must be set using diver log history or their dive computer.

**BAP:** *Diving requirements are currently under review in the BAP salmon standards.*

#### 4. Environment: Wetland Conservation and Biodiversity Protection

Mangrove and wetland conservation requirements should apply to onshore farm buildings, such as feed or chemical stores and office buildings, that support marine and freshwater cage sites.

**BAP:** *Agreed. The standard is intended to cover farm buildings. Modify Implementation Guidelines, p. 6, to make this explicit:*

*“Farm construction and operations, including all building works, shall take place outside wetland areas and not lead to their loss.”*

Since this standard is intended to be universal, the standard could be changed into a generic standard for farm siting and include components for wetland conversion. There may be other sensitive and protected habitats that farms might be sited in, such as forests that require protection and restoration.

**BAP:** *This is a logical step, but the standard already requires that the project be legally sited. These provisions are targeted at mangroves and other wetlands, which are a major area of concern.*

Informational questions should be gathered to ascertain the level of wetland loss before 1999, and be considered for future standards, such as a no-net-loss standard or further restoration. This is particularly relevant for shrimp farms, since much of the mangrove forest lost to this industry occurred before 1999. Additionally, information should be gathered on the type of restoration chosen (natural, replanted, or paid for) and its status, and be available to the auditor to see year-on-year change.

**BAP:** *Yes, mangrove loss to shrimp farms has been almost negligible since 1999, with most damage taking place in the 1980s. This BAP standard is designed to help make such improvements in wetland stewardship permanent. Establishing the extent of historical wetland loss (which may have originally taken place due to other activities such as traditional extensive pond culture or rice cultivation) is beyond the scope of BAP.*

4.1 does not provide the auditor sufficient guidance on whether or not mangroves were lost in the process of farm construction. "High ground" can sometimes be surrounded by mangrove forests, but also farms can occupy areas where many other farms exist, meaning that wetland vegetation may be absent. Evidence should include aerial and satellite photos, where available, and could be supported with shallow sediment cores to identify mangrove or wetland vegetation material. Where mangroves were protected by law before 1999, the auditor should use the earlier date to verify whether the conversion was for allowable purposes and for the restoration requirement.

**BAP:** *Agree that this is potentially difficult. Gross signs of recent mangrove damage (tree stumps, acid-sulphate run-off from newly exposed organically rich mangrove soil) are not hard to detect, but all changes in land use that have taken place since 1999 will not be immediately obvious to the auditor. However, a lot of shrimp farms built on former mangroves are short-lived because of the difficulty of managing water exchange, biosecurity and pond bottom chemistry. The most durable farms are built further inland on soils of good agricultural quality, so the auditor can still glean a lot of useful information by studying the farm and its surroundings. On p. 6, the Implementation Guidelines state:*

*"During initial inspection, the auditor will record farm areas occupied by mangroves or wetland vegetation. If dying vegetation is observed around farms, the auditor will determine if the mortality is the result of farm operations."*

*The auditors are trained to gather photographic (and available satellite) evidence in support of their assessment of whether a farm is or is not in compliance with clause 4.1. They also check the surroundings for any construction activity that may involve mangrove or wetland alteration.*

4.2 should include language indicating a preference for natural restoration over replanting and that the auditor must verify that the restoration is likely to be viable (e.g., hydrological access for propagules). Farms should obtain signed disclosures from restoration organizations that the restoration is equivalent to three times the original area, and is protected by law from further conversion.

A further consideration for a technical committee would be to preferentially encourage coastal mangroves (within 100 m of the coast and/or those in critical need areas) above more inland restoration efforts. A possible incentive would be to use a 1:1 or 2:1 restoration for these areas vs. a 3:1 inland.

**BAP:** *Agreed. Mangrove restoration through hydrological restoration and natural reseedling is usually preferable to replanting. Therefore modify the Implementation Guidelines on p. 6 by replacing "replanting" with "restoring" and "restoration." Restoration can encompass replanting, and farms often make use of propagules to help mangroves to re-establish themselves:*

*"Wetland removed for such purposes shall be mitigated by restoring an appropriately diverse area of wetland three times the size of the area removed."*

*"If restoration is conducted, the auditor will verify that it is viable by confirming it is initially healthy, appropriately dense and still healthy at subsequent annual audits."*

*For restoration projects, the typical verification is an acknowledgement from the restoration organization for a donation for the restoration or planting of x no. of hectares of mangroves. This comes into play for this clause and also frequently in standard. 2 "Community Relations," where mangrove volunteerism, replanting and awareness campaigns are popular means of demonstrating "unrequired mangrove stewardship."*

4.3 needs to be realistic about what is achievable by the auditor during the farm visit and the information they are likely to have available. The goal of this standard is good, but the language is very broad. This could be reworded to something like “if wetland areas are adjacent to the farm, the auditor must verify that they are hydrologically connected, such as by a stream to the coast.”

**BAP:** *The Implementation Guidelines offer help here, p. 6:*

*“During initial inspection, the auditor will record farm areas occupied by mangroves or wetland vegetation. If dying vegetation is observed around farms, the auditor will determine if the mortality is the result of farm operations. If it is, a warning will be issued and the deficiency shall be corrected for continuation of certification.”*

*Auditors rely on site and layout maps, which typically only cover the farm and immediate surrounding area. Most auditors can easily recognize a viable stand of recently planted mangroves and whether or not there is the requisite connection to a brackish water source. Propagules are only viable when they are periodically bathed in salt or brackish water.*

#### 5. Environment: Effluent Management

This standard should include measures or estimates of cumulative impacts of farm effluents. Ideally this could be included as a component of a required AMA for land-based systems sharing the same river basin or water source.

**BAP:** *Agreed. When AMAs are extended to land-based farms this is a logical step. At the moment, the standard requires a water usage calculation that, combined with the effluent concentrations, reveals annual nutrient loads.*

Reducing water exchange can improve biosecurity as well as reduce effluent loads, and is particularly relevant for the farmed shrimp industry. We propose the introduction of a standard that requires shrimp farms to only exchange water when pond water quality deteriorates below a certain level (e.g., dissolved oxygen levels of 4 mg/l) or to prevent overflowing.

**BAP:** *This frames good practice but it is probably too prescriptive to be the basis for BAP standards that try to focus on desirable outcomes and leave the farmer to choose management measures to comply. Water quality requirements vary greatly between species, for example with Pangasius, an air-breather, thriving in water that would not support other species.*

Informational data should be collected on whether farms recycle effluents, water quality, and annual loading, for use in future standard setting.

**BAP:** *Yes. Please refer to Appendix C.*

Values should be adjusted consistent with the philosophy of continual improvement, since this is a significant update for the shrimp standard.

5.2 The auditor should visually confirm that the land area used for agricultural crops is a reasonable size to use the nutrients released from the farm (based on the farm size).

5.3 needs replacing, in our opinion. For example, an extensive 50-hectare (ha) shrimp pond would have a far lower effluent impact than an intensive farm of the same size. Another consideration is that some species have higher nutrient requirements in their feed than others and may be raised at higher stocking densities, meaning that two intensive 50-ha farms of different species (e.g., shrimp vs. channel catfish) may present greatly different pollution risks.

Also, it should be noted that some aquaculture industries are concentrated in specific areas, such that the cumulative impact of many smaller farms in close proximity to one another may be significant, and therefore the concentration of pollutants in the individual effluent streams could be important. An alternative approach to this standard could include a decision matrix based on farm size or production, industry concentration, intensity of farming, and a mass balance system to determine nutrient loads, with increasingly rigorous effluent requirements relative to the pollution risk. The requirement for settling systems or filtration could also be introduced here, particularly for raceway systems.

**BAP:** Agreed. This standard does reveal the limitations of setting fixed metrics in standards because they are not adapted to all possible situations. However, the 50-ha threshold seems valid as a means to avoid large farms from using the exemption in 5.3. An auditor can readily assess a farm's area.

*At first sight, clause 5.3 appears to be a relaxation of the existing BAP effluent controls, but it is in fact a tightening of requirements. It's a modification that aims to recognize and encourage farms to recycle nearly all their water. Such water-reuse systems are becoming popular and have even attracted their own eco-certification label: Cycle Shrimp.*

*Clause 5.3 is also crafted to favor small-scale users (under 50 ha) that switch to reuse systems. As you have rightly noted above, FAO guidelines require special provisions for small-scale farmers, and the 50-ha threshold is one such provision.*

*This clause is targeted at those small shrimp farms, e.g. in Thailand and India, that are in fact leading the industry by limiting water use except for replacement after harvest. Some farms even recover most of the water used for the first crop in a two-crop season, as is the case in most of India.*

5.5 does not state the auditor will take samples during the audit, and also if those samples must abide by the sampling guidelines in the text (e.g., two samples taken between 5 a.m. and 7 a.m., and 1 p.m. and 3 p.m.). If the auditor is required to collect samples at these times, is that realistic for a farm audit, given that some farms are well outside populated areas?

**BAP:** The Implementation Guidelines provide clarity on this point, p. 7:

*"To confirm compliance with BAP water quality criteria at farms, the auditor will during the inspection process witness effluent sampling and preparation for analysis by an independent laboratory.*

*Analysis of the samples collected by the auditor shall be done by a private or government laboratory following standard methods as published by the American Public Health Association, American Water Works Association and Water Environment Federation – <http://www.standardmethods.org>."*

*The Implementation Guidelines describe how samples must be handled so that they don't deteriorate before they can be analyzed. Auditors are trained to witness the sampling procedure. If they miss the 0500-0700 window (which is needed for D.O.), they will cover the sampling for the other water quality variables.*

#### 6. Environment: Water Quality Control

Since standard 6 applies to many species, maximum daily feeding rates should be set based on the nutrient content of feeds, rather than the weight used.

**BAP:** Agreed. Ideally they should. The existing feeding rate limits are based on typical compound feeds used for tilapia. These limits, combined with FIFO targets, do impose a cap on potential pollution.

Standard 5.12.2 from the tilapia standard is missing from the draft. This standard came into effect if multiple cages were in the same water body (i.e., from more than one farm site), then the total daily feed input of all operations into that water body had to meet the maximum daily feed input based on hydraulic retention time (HRT). This is an important standard and should be included in this draft. This standard could also be tied into an AMA for freshwater cage systems.

**BAP:** Agreed. Additional clause needed.

*The Implementation Guidelines already state:*

*"If there are multiple cage and net pen operations in a water body, the total daily feed inputs of all operations shall not exceed the maximum allowable daily feed input based on HRT."*

*Additional Clause:*

*6.3: Is it true that the total feed input for all culture operations on the lake or reservoir does not exceed the BAP maximum allowable daily feed input?*



## 7. Environment: Sediment Control

The primary role of AMAs is for disease control and biosecurity rather than sediment control. Standards 7.8 and 7.9 should be moved to the biosecurity standard (#15).

**BAP:** *Agreed, but make use of cross-references rather than move AMA requirements. The AMA requirements only apply to marine cage farms at the moment. Hence they are in Section 7, which is exclusive to marine cages.*

*This is a good starting point and a significant step in the evolution of this set of BAP farm standards, which has previously been focused exclusively on the management of individual farms. The intention is for the standards to evolve further and include AMA requirements for all production systems in the future after experience is gained with the implementation of AMA requirements for marine cages.*

*Modify Standard 13 (Drug and Chemical Management) by adding a cross reference to AMAs to the Implementation Guidelines on p. 24:*

*“Good health management focuses on the prevention of disease rather than disease treatment with chemical compounds.*

*The best ways of controlling disease are to avoid stocking diseased fish, adopt fallowing and “all in, all out” stocking procedures at cage and net pen sites (see area management requirements, Standard 7), and avoid environmental stress by maintaining good water quality in culture systems.”*

*Also modify Standard 15 to include a cross-reference on p 25:*

### *Implementation*

*Measures shall be taken to avoid the spread of disease within the BAP farm or to neighboring farms or client farms to which animals are transferred for further growout. For marine cage farms, see also area management requirements, Standard 7.*

The majority of standards in this section are taken from the BAP salmon standards. Regarding sediment control, Atlantic salmon farming is often a highly regulated and monitored industry, though regulations, benthic health indicators, and sampling practices differ between jurisdictions. The metrics in the salmon standards were used because the costs associated with new metrics in areas where salmon are farmed would be too burdensome.

Since the universal standards will be applied to many different industries and in countries where regulations are not as extensive; we believe more guidance and metrics should be included in the standards. These metrics and requirements should be based on the size of the farm, water depth, and sediment type.

**BAP:** *It is felt that the existing provisions of the salmon standard are a valid reference point. As regards countries with no sediment monitoring regulations, the Implementation Guidelines are clear enough and they do require the characteristics you mention (the size of the farm, water depth, and sediment type) to be taken into consideration:*

*“In countries or regions where sediment monitoring is not required as described above and/or where an allowed sediment impact zone is not defined, applicants shall write and implement a monitoring plan that requires them to:*

- Nominate an independent individual or company with demonstrated expertise in sediment sampling and analysis to design a sediment sampling and analysis program appropriate to the farm conditions and to conduct sediment monitoring as required below.*
- Chart an allowable sediment impact zone that shall not exceed the total area of the farm plus a boundary zone of 40 m around it. The footprint may be shifted in any direction to account for normally occurring uneven current patterns, as long as the total area remains the same.*
- Monitor the organic build-up on the seabed within this zone by the method deemed best for the type of sediment that exists there. The choice of method shall be justified by prior documentation of the type of sediments over which the farm is located.*
- Conduct sediment sampling to coincide with the period of peak feeding during each crop cycle. Samples shall be taken along at least two transects that pass directly through the farm and align with the dominant flow of water at the farm site. One sample with three replicates shall be taken at the edge of the farm and another at the 25-m or 40-m boundary. (See above.)*

- *Five replicate samples shall also be taken from at least two reference stations within 1 km of the farm that have similar depth and sediment characteristics as occur at the farm and where there is no fish production.*
- *Demonstrate by statistical analysis of the results that there is no organic build-up due to farm activity at the boundary of the allowable sediment impact zone in comparison to the reference station, as determined by the monitoring method chosen.*
- *Collect and store data from which the farm's feed based carbon and nitrogen discharges can be calculated."*

7.1 Based on farm size, farms in shallower water (less than 40 m) with sediment bottoms should be required to measure at least one chemical and one biological parameter at a suitable down current distance from the cages. Chemical parameters, such as sulphides, redox potential, and organic carbon should be suggested for testing, and with a guidance limit for each in case that national rules are less rigorous or don't exist (e.g., 1,300 µM/l sulphide). Biological assessments could include assessments by grabs, videos, or full biodiversity assessments. Depending on farm size, these could range from simple presence/absence assessments to more detailed assessments.

**BAP:** *However, as with the salmon standard, there is a need to avoid being over prescriptive. Clause 7.4, combined with the implementation requirements (listed above in response to previous comment):*

*7.4: Monitoring of sediment conditions shall be undertaken at the time of peak feeding during the production cycle and shall be conducted according to the requirements of the farm's operating permits or its own plan in countries or regions where sediment monitoring is not required, and as specified in the implementation requirements.*

Depending on farm size, a mandatory fallow period should be included.

**BAP:** *As with the salmon farm standards, it is felt that a mandatory fallow period would be too prescriptive. Where possible, the BAP standards focus on defining desirable outcomes rather than the precise means of achieving them.*

## 8. Environment: Soil and Water Conservation

8.1 Farms should be required to monitor seepage and a maximum cap should be set for this. Controls are also required on the release of saline water into fresh or seasonally fresh water, even if the farm is on non-permeable soil or lined.

Saline water release has been known to affect agricultural crops downstream of inland shrimp farms. A proposed standard would be not to release saline water into inland water bodies when they are tested as "freshwater." This could also be built into pond AMAs, where farms operate in (or outfall into) the same river basin. A definition of permeable soil should be included.

**BAP:** *See clause 8.2, which targets salinization:*

*8.2: For inland brackish ponds, quarterly monitoring of neighboring well and surface water shall not show that chloride levels are increasing due to farm operations.*

*Appendix A also states: No discharge above 800mg/l chloride into freshwater (initial requirement). Freshwater being defined as "Water with less than 1 ppt salinity, specific conductance below 1,500 mmhos/cm or chloride < 500 mg/l."*

8.4 The language used is too vague to be audited effectively, and issues that need to be addressed should be divided into separate and clear standards. Would subsidence have been addressed through monitoring the water table in 8.3? For flow-through systems like raceways, the change in flow of water may be significant and, as such, stronger wording is required for this production system.

**BAP:** *Although the language here does not cover every eventuality or possible impact, clause 8.4 is still useful. In cases where abstraction for aquaculture has caused land subsidence, e.g. in Taiwan in the 1980s, buildings have been undermined, and this damage was immediately apparent. Admittedly, "ecological damage" covers a lot of possibilities. As such, the clause can be useful because it gives the auditor the ability to demand corrective actions for a farm that is causing obvious ecological damage through overuse of freshwater resources.*

8.4: *Use of water from wells, lakes, streams, springs or other natural sources shall not cause ecological damage or subsidence in surrounding areas.*

8.6 change “avoided” to “not permitted.”

**BAP:** *Agreed. Modify 8.6. And it needs to be clear, as stated in the Implementation Guidelines, that we are referring to wetlands:*

8.6: *Dredge and fill activities in sensitive wetlands or wetland buffers, aimed at increasing the area available for pond construction, shall not be conducted.*

8.7 seems to be contradicted by 8.9 regarding soil containment on the farm. Biosecurity should be considered when disposing of sediments.

**BAP:** *8.7 talks about the use of sediments for agriculture or landfill, while 8.9 discourages the creation of piles of soil (degraded areas).*

8.11 The language here is unclear. What will be audited? This should be considered in terms of farm size.

**BAP:** *The relevant Implementation Guidelines are:*

*“Prevention of erosion avoids resedimentation of soil material from effluents downstream from farms. The control of erosion from effluent involves reducing the impact energy of discharges upon soil and reducing water velocity in ditches to prevent scouring. Drainpipes should extend at least 1 m beyond embankments at an elevation near the ditch bottom. The pipe outlet area should be protected with a splash shield or riprap to reduce effluent energy. Drainpipes that discharge directly into streams should extend over the stream bank to prevent erosion and be located near the stream’s normal water level.”*

8.12 should state that the minimum sedimentation pond size must meet or exceed the value derived using the calculation in the guidance (though the calculation itself needs to be made clearer; for example, where does “37.5” come from?). Does this make sense for raceway systems, which could use alternative filtration systems, such as drum filters? Perhaps change to ponds only or create a separate standard for raceways?

**BAP:** *Agreed. Need to specify this is for pond farms. Modify 8.12 thus:*

8.12: *If the applicant’s ponds produce more than 20 mt/ha/crop, the facility shall possess sufficient sedimentation basin capacity to handle the associated sludge/sediment. The facility shall process all sludge/sediment in sedimentation basins and not dump material in sensitive wetland or mangrove areas, or public water bodies.*

*Please refer to the equation in Appendix A (appended to this response). The 37.5 comes from rearranging the equation.*

## 9. Environment: Fishmeal and Fish Oil Conservation

The language used in this standard differs in places from the GAA’s feed mill standards. This is most evident with the language in the “Implementation” section, which identifies that fishmeal and fish oil shall come from approved certified sources before June 2015, whereas the BAP Feed Mill Standards (Rev 6/12) only requires that at least 50% of fishmeal and fish oil from direct reduction fisheries and at least 50% of fishmeal and fish oil from by-products come from approved certified sources by 2015.

**BAP:** *Agreed. Need to clarify the Implementation Guidelines, p. 17:*

*“This requirement will be reassessed before June 2015 with the ultimate goal that all fishmeal and fish oil should come from approved certified sources.”*

Standard 9.7 of the universal draft is an additional element.

**BAP: 9.7:** *If there is a lack of availability of marine ingredients from certified responsible sources, the feed supplier shall use ingredients from fishery improvement projects as these become available.*

We would prefer that the GAA use the more stringent of the two sets of standards, but consistency between the universal and feed mill standards should be ensured. The GAA should undertake a revision of the feed mill standard by a representative multi-stakeholder technical committee to set appropriate criteria for fishmeal and fish oil sourcing and maintain consistency between the two standards.

**BAP:** *The question of the feed mill standards and, in particular, the fishmeal/fish oil requirements, will go to the SOC.*

We approve of the inclusion of limits on fishmeal and fish oil set in this standard revision, since the previous species standards set no limits. (Note that the language referring to this still exists in the “Implementation” section and should be deleted). However, we have concerns over the methodology used and the metrics set.

**BAP:** *Agreed. Implementation Guidelines need to be modified:*

*“Metric standards for some key aquaculture species have been set and anonymous, pooled fish in:fish out data shall be used in the future to establish metric standards for other species.”*

We would prefer the use of the Feed Fish Equivalency Ratio (FFER) calculation, as used in Tacon and Metian (2008)<sup>6</sup>. This calculation does not make assumptions about the use of leftover fishmeal and fish oil once the species needs are met, and thus gives a clearer image of the fisheries resources needed to raise a species relative to the GAA’s FIFO system.

**BAP:** *The method adopted is that of Jackson/IFFO, which, although not perfect, avoids some of the distortions inherent in the Tacon method. Both methods can track trends and can be used to encourage more efficient usage of fishmeal and fish oil (<http://www.iffonet.net/downloads/100.pdf>).*

We are also concerned that the limits set in the standard are inconsistently challenging to the species named. For example, using the average fishmeal and fish oil inclusion factors (10% and 1.5%, respectively) and feed-conversion ratios (FCRs) (1.5) presented for Vietnam catfish in Tacon and Metian (2008), the FIFO is 0.66. This is above GAA’s limit for *Pangasius* and therefore highly challenging for this industry.

However, if we backtrack from the *L. vannamei* FIFO limit of 1.5 (using reasonable estimates based on the Aquarium’s experience of an FCR of 1.5 and a fish oil inclusion percentage of 1.5), then feed can contain as much as 26.5% fishmeal in the feed, which (again, based on our experience) is not as challenging. We believe that in order to set more meaningful FIFO (or preferably FFER) limits that represent improvements over industry norms, a representative multi-stakeholder technical committee that includes eNGOs and farmers should be used.

**BAP:** *The reference point for the BAP FIFO ratios is the Aquaculture Dialogues rather than Tacon’s data.*

*The Aquaculture Dialogue standards aim to identify the best 20% of producers, while BAP is a more mainstream standard. The BAP FIFO limits are thus set marginally higher at approximately 1.2 x the Aquaculture Dialogue targets. Some approximation is necessary because the two calculation methods are different, with the dialogues basing their ratios sometimes on fish oil and sometimes on fishmeal and the Jackson method using oil and meal.*

We believe that a generic cap of FIFO should be included for where no species-specific limits are specified, so that excessive users of fishmeal and fish oil are excluded. We propose an upper limit for that generic bar to be an FIFO of 2.0, as this is the initial limit for farmed salmon, decreasing to 1.5 by 2016. However, this limit would be best set by a representative multistakeholder technical committee that includes eNGOs, farmers and feed producers.

**BAP:** *Good idea for consideration, but probably too prescriptive at this stage in the absence of accumulated data from the field for a wide range of species. Remember how salmon farming started with high FIFO ratios but now has greatly reduced them. A global FIFO limit could damage innovation because new aquaculture candidate species may not initially be efficient converters.*

Feed ingredients other than fishmeal and fish oil can be associated with environmental concerns (e.g., soy, GMOs), and should therefore be addressed in these standards as well as the feed mill standards. Environmental benefits can also be gained by using local resources as opposed to transporting others from long distances, provided these meet the environmental metrics. A preference for qualifying local ingredients or by-products should be encouraged.

**BAP:** *Agreed. But given the importance of sustainably sourced fishmeal and fish oil, this is a good issue to start on.*

Feed data should be collected in an informational question for future standard setting and for recording progress towards improvement.

9.1 The data here are captured in point 9.6's requirement to meet the feed mill standards 3.1 and 3.2; suggest deleting.

**BAP:** *Agreed. There is duplication, but it's helpful to also keep 9.1 as a stand-alone requirement should the feed mill requirements 3.1-3.3 be modified in the future.*

9.5 see comments above.

9.7 is not in the feed mill standards; please see the above comments.

How will fishery improvement projects (FIPs) be identified, and how will effective projects be separated from ineffective projects? The Conservation Alliance for Seafood Solutions has published guidelines on supporting FIPs that could be used to define suitable FIPs. In the case that no certified or FIP products are available, a list of criteria (e.g., dynamite or poison fishing) that would exclude certain fisheries based on poor environmental performance should be included.

**BAP:** *These are important considerations. The standard only aims to encourage the development of FIPs. The longer-term solution is certified fishmeal and fish oil.*

10. Environment: Stocking Sources, Control of Escapes, Biodiversity and Wildlife Protection, GMOs  
The "Reason for Standard" section includes the statement "since some consumers do not desire genetically modified foods, they should be provided with reliable information to enable informed choices." However, the BAP program does not have a mechanism in place for informing consumers that a species had been genetically modified, or fed genetically modified feed ingredients, and does not require that this information be captured in the traceability standard (#16), but only requires that the farm maintain records on this. This information should also be collected by the auditor for GAA records. The GAA should then decide if they wish to label these products as part of their program.

**BAP:** *This is certainly an important issue. The Implementation Guidelines state:*

*"Should genetically modified fish or crustaceans be commercialized in the future, producers shall comply with all regulations in producing and consuming countries regarding such organisms."*

*So the BAP program is primed to address the question of GMOs. The existing BAP record-keeping and traceability requirements ensure that the farmed species, irrespective of G.M. status, is correctly identified along the value chain. Note additionally that the BAP salmon standards prohibit the production of GMO salmon in cages even though such fish are not yet commercialized.*

*The issue of G.M. feed ingredients is best addressed through organic standards rather than mainstream standards such as BAP.*

Regarding non-native species introductions, conforming to the codes stated is an important step. However, the GAA could encourage the use of additional technologies, such as sterility, ploidy, monosexing, etc, to further reduce escapement impact potential. FAO and ICES codes include some ongoing requirements for farms, such as monitoring for the presence of the species in the surrounding areas. These should be included in the standard 10.6.

**BAP:** *Agreed. New recommendations on page 18:*

*“Non-Native Species*

*Introductions of species to countries where such species are not native, not feral or not already farmed shall be subject to the provisions of the 2005 ICES Code of Practice on the Introductions and Transfers of Marine Organisms or, in the case of freshwater species, FAO 1988: Codes of Practice and Manual of Procedures for Consideration of Introduction and Transfers of Marine and Freshwater Organisms. To reduce the potential impact of escapes, technologies such as sterility, ploidy and monosexing are encouraged.”*

Informational data should be collected on numbers of escapes, reasons for escape, number and species of predator mortalities, and the cause of each mortality. This information should be used by the GAA to set new standards.

Fish Containment and Wildlife Interaction Plans should be a requirement for all species, but with a reduced burden for small-scale producers.

**BAP:** *The BAP requirement for fish containment and wildlife interaction plans started with the salmon farm standards and is now being required for marine cage farms. Logically it will become a universal BAP requirement as the program evolves. In general, BAP tries to set universal standards that can be applied to different-sized operations, so a lower standard for small farms is not planned.*

10.2 and 10.4 should be combined into one standard.

**BAP:** *Agreed. 10.2 effectively covers 10.4, so 10.4 can be removed.*

10.3 may need language for estimating the numbers of a species stocked where accurate counting (> 3% error) technologies do not exist.

10.5 Given this is a universal standard, is some nuance required for when wild juveniles do not present environmental risks (such as if wild populations are healthy)? If this adjustment is made, the health status of the wild juveniles would need to be established; e.g., through quarantine.

**BAP:** *For aquaculture of fish and crustaceans (i.e., excluding mussels and some other bivalves), it is felt that hatchery production of seed is a basic building block for a more sustainable industry based on selective breeding. The progressive trend will eventually include exclusive use of captive-reared broodstock, too. Harvesting of wild juveniles has the potential to create conflicts with fisheries and may have negative biodiversity impacts.*

10.8 Recommend raising this to double screens (or a similar back-up in place) and adding a requirement for regular inspection (e.g., at least daily) and maintenance.

10.9 should include a monitoring requirement (e.g., at least twice each week) for the nets that the auditor can verify.

10.10 needs some more guidance. This may be fine for small-scale cage systems, but for larger operations, an engineer report might be required with some minimum specs set by the GAA.

**BAP:** *The existing requirement for input from local producer associations avoids the risk of being unhelpfully prescriptive.*

Both 10.11 and 10.16 should include failure analysis and a feedback loop to address future risks. The auditor should ensure that failures were not a result of inconsistency with the GAA standards.

**BAP:** *The Implementation Guidelines spell out the requirements for the Fish Containment Plan and these do require feedback:*

- A site risk analysis updated at least annually shall identify the potential and actual causes of fish escapes, determine their relative likelihood of occurrence or recurrence at the farm site, and identify critical control points for effective escape risk monitoring, reduction and response by farm staff.*
- Procedures based on the risk analysis shall include management protocols and actions designed to monitor escape risks, reduce them when identified and respond to escape events in a timely and effective manner. The efficacy of these measures shall be verified and documented through the year.*

• *If an escape is known or suspected to have occurred, the cause shall be investigated immediately, and steps shall be taken to correct it. These actions shall be documented in farm records.*"

11. Environment: Storage, Disposal of Farm Supplies and Wastes

11.1 could be combined with 11.2 and 11.3. Why are "agricultural" chemicals singled out? Farms should keep material safety data sheets (MSDS) or equivalent for all hazardous chemicals (hazardous to the environment, species stocked or personnel) stored and used on the farm.

**BAP:** *It's just to distinguish these mostly bulky items from "drugs and chemicals," which are covered in Standard 13.*

11.4 is ambiguous and calls for auditor judgment calls, which could be inconsistent. Recommend rewording for clarity of auditable requirements.

11.6, does this capture 11.7 and 11.8?

**BAP:** *Yes, there is some overlap between these standards but auditor and self-assessment feedback indicates that they each serve to draw attention to specific issues.*

7 Available at:

[www.solutionsforseafood.org/sites/solutionsforseafood.org/files/documents/fip\\_guidelines.pdf](http://www.solutionsforseafood.org/sites/solutionsforseafood.org/files/documents/fip_guidelines.pdf)

11.9 should be reworded for audit consistency; e.g., *evidence of measures to prevent infestation...shall be evident during the audit.*