

Monterey Bay Aquarium Seafood Watch®

Developing Seafood Watch Recommendations

Contents

Introduction	2
Need for Seafood Watch Assessments.....	2
Seafood Watch Standards for Fisheries and Aquaculture.....	2
Guiding Principles	2
Fisheries Guiding Principles	3
Aquaculture Guiding Principles	3
Standards Performance Criteria	3
Fisheries Criteria	4
Aquaculture Criteria.....	8
Scoring Methodology.....	12
Seafood Watch Assessment Tool.....	13
Seafood Watch Assessment Process	13
Scope of Assessments.....	13
Prioritizing Assessments	14
Recruiting Assessors	15
Training Assessors.....	15
Assessment Process for Fisheries and Aquaculture Operations	16
Seafood Eco-certification Programs	18
Update history (beginning Jan 2017).....	18

Introduction

The purpose of this document is to provide an overview of the Seafood Watch process for assessing wild fisheries and aquaculture operations against the Seafood Watch Standards for Fisheries and Aquaculture (Standards). The current Standards can be found on the Seafood Watch website [here](#).

Need for Seafood Watch Assessments

The Seafood Watch standards and assessments currently fill a critical role in the North American marketplace. The assessments identify the environmental performance of the fishery or aquaculture operation in question providing producers with areas for improvement. The resulting fishery and aquaculture ratings inform the seafood purchasing decisions of concerned consumers and businesses. Elements of the Seafood Watch standards and program that are unique to existing eco-certification schemes and ratings programs include the following:

1. We assess the majority of the seafood on the North American market. Initial estimates are that our current recommendations cover some 70-80% of the total seafood on the US market, by volume;
2. We use a three tiered system approach with the intention of recognizing better and best performers;
3. We publish all assessment results regardless of score and rating outcome at www.seafoodwatch.org;
4. Our fisheries and aquaculture Standards press for improvement beyond current best practice;
5. Our assessments are non-voluntary;
6. Our Standards are structured to assess the impacts from farms and fisheries not only in isolation, but also in the context of the cumulative effects of multiple fisheries and aquaculture farms in the region.

Seafood Watch Standards for Fisheries and Aquaculture

The Seafood Watch [standards](#) consist of:

1. Defined guiding principles or objectives
2. Science-based performance criteria that are regularly revised based on the input from fishery and aquaculture experts
3. A robust and objective scoring methodology that results in a transparent assessment of a fishery or aquaculture operation against the respective criteria

Seafood Watch revisits the performance criteria every four years to reflect the most current science and thinking in sustainable fisheries and aquaculture. The current standards were completed in late 2015 and will be used for all assessments beginning Jan 1 2016. The revision process is documented [here](#). Assessments conducted from 2012 to 2015 inclusive were against the previous standards, available [here](#) (capture fisheries) and [here](#) (aquaculture). Assessments conducted prior to 2012 were against an earlier set of criteria, available [here](#) (wild) and [here](#) (aquaculture).

Guiding Principles

Seafood Watch defines sustainable seafood as seafood from sources, whether fished or farmed, that can maintain or increase production without jeopardizing the structure and function of affected ecosystems. In keeping with this definition, Seafood Watch refers to the following guiding principles to illustrate the qualities that fisheries and aquaculture operations must possess to be considered sustainable. These objectives inform the performance criteria and scoring methodology used to assess fisheries and aquaculture operations. A description of each principle can be found in the [standards](#) documents.

Fisheries Guiding Principles

Sustainable wild capture fisheries:

1. Follow the principles of ecosystem-based fisheries management;
2. Ensure all affected stocks¹ are healthy and abundant;
3. Fish all affected stocks at sustainable levels;
4. Minimize bycatch²;
5. Have no more than a negligible impact on any threatened, endangered or protected species;
6. Are managed to sustain long-term productivity of all affected species;
7. Avoid negative impacts on the structure, function or associated biological communities of marine habitats where fishing occurs;
8. Maintain the trophic role of all marine life;
9. Do not result in harmful ecological changes such as reduction of dependent predator populations, trophic cascades, or phase shifts;
10. Ensure that any enhancement activities and fishing activities on enhanced stocks do not negatively affect the diversity, abundance or genetic integrity of wild stocks;

Aquaculture Guiding Principles

Sustainable aquaculture farms and collective industries:

1. Have robust and up-to-date information on production practices and their impacts (or lack of impacts) publically available;
2. Prevent effluent discharges from exceeding, or contributing to exceeding, the carrying capacity of receiving waters at the local or regional level;
3. Are located at sites, scales and intensities that maintain the functionality of ecologically valuable habitats;
4. Limit the type, frequency of use, total use, or discharge of chemicals to levels representing a low risk of impact to non-target organisms;
5. Source sustainable feed ingredients and converting them efficiently with net edible nutrition gains;
6. Prevent population-level impacts to wild species or other ecosystem-level impacts from farm escapes;
7. Prevent population-level impacts to wild species through the amplification and retransmission, or increased virulence of pathogens or parasites;
8. Use eggs, larvae, or juvenile fish produced from farm-raised broodstocks thereby avoiding the need for wild capture;
9. Prevent population-level impacts to predators or other species of wildlife attracted to farm sites;
10. Avoid the potential for the accidental introduction of non-native species or pathogens during the shipment of live animals;

Standards Performance Criteria

The goal of our sustainability criteria is to allow for the assessment of the sustainability of fisheries or aquaculture operations according to our guiding principles and conservation ethic.

¹ “Affected” stocks include all stocks affected by the fishery, no matter whether target or bycatch, or whether they are ultimately retained or discarded.

² Seafood Watch defines bycatch as all fisheries-related mortality or injury other than the retained catch. Examples include discards, endangered or threatened species catch, pre-catch mortality and ghost fishing. All discards, including those released alive, are considered bycatch unless there is valid scientific evidence of high post-release survival and there is no documented evidence of negative impacts at the population level.

Fisheries Criteria

Through four criteria and twelve associated factors we assess fisheries to determine whether the abundance of both targeted and incidentally caught species is maintained in the long term at levels that allow the species to fulfill its ecological role while the structure, productivity, function and diversity of the habitat and ecosystem are all maintained. Furthermore we determine whether a management system is in place that enforces all local, national and international laws to ensure long-term productivity of the resource and integrity of the ecosystem by adhering to the precautionary approach and responding to changing circumstances.

Criterion 1 – Impacts of the Fishery on the Species Under Assessment

Relevant Guiding Principles

Ensure all affected stocks are healthy and abundant. Abundance, size, sex, age and genetic structure should be maintained at levels that do not impair the long-term productivity of the stock or fulfillment of its role in the ecosystem and food web.

Fish all affected stocks at sustainable levels. Fishing mortality should be appropriate given current abundance and [inherent vulnerability](#) to fishing while accounting for scientific uncertainty, management uncertainty, and non-fishery impacts such as habitat degradation.

The cumulative fishing mortality experienced by affected species must be at or below the level that produces maximum sustainable yield for single-species fisheries on typical species that are at target levels.

Fishing mortality may need to be lower than the level that produces maximum sustainable yield in certain cases such as multispecies fisheries, highly vulnerable species, or fisheries with high uncertainty.

For species that are depleted below target levels, fishing mortality must be at or below a level that allows the species to recover to its target abundance.

Factors

Factor 1.1 Abundance

Goal: Stock abundance and size structure of native species is maintained at a level that does not impair recruitment or productivity

Factor 1.2 Fishing Mortality

Goal: Fishing mortality is appropriate for current state of the stock

Criterion 2 – Impacts on Other Capture Species

Relevant Guiding Principles

Ensure all affected stocks are healthy and abundant. Abundance, size, sex, age and genetic structure should be maintained at levels that do not impair the long-term productivity of the stock or fulfillment of its role in the ecosystem and food web.

Fish all affected stocks at sustainable levels. Fishing mortality should be appropriate given current abundance and [inherent vulnerability](#) to fishing while accounting for scientific uncertainty, management uncertainty, and non-fishery impacts such as habitat degradation.

The cumulative fishing mortality experienced by affected species must be at or below the level that produces maximum sustainable yield for single-species fisheries on typical species that are at target levels.

Fishing mortality may need to be lower than the level that produces maximum sustainable yield in certain cases such as multispecies fisheries, highly vulnerable species, or fisheries with high uncertainty.

For species that are depleted below target levels, fishing mortality must be at or below a level that allows the species to recover to its target abundance.

Minimize [bycatch](#). Seafood Watch® defines bycatch as all fisheries-related mortality or injury other than the retained catch. Examples include discards, endangered or threatened species catch, bait species, pre-catch mortality and ghost fishing. All discards, including those released alive, are considered bycatch unless there is valid scientific evidence of high post-release survival and there is no documented evidence of negative impacts at the population level.

The fishery optimizes the utilization of marine resources by minimizing post-harvest loss and by efficiently using marine resources as bait.

Have no more than a negligible impact on any threatened, endangered or protected species

The fishery avoids catch of any threatened, endangered or protected (ETP) species. If any ETP species are inadvertently caught, the fishery ensures and can demonstrate that it has no more than a negligible impact on these populations.

Factors

Factors 2.1-2.2 Abundance and Fishing Pressure are assessed in the same way as in Criterion 1.

Factor 2.3 Modifying factor: Discards and bait use

Goal: Fishery optimizes the utilization of marine resources by minimizing post-harvest loss. For fisheries that use bait, bait is used efficiently.

Criterion 3 - Effectiveness of Management

Relevant Guiding Principles

The fishery is managed to sustain the long-term productivity of all affected species. Management should be appropriate for the inherent resilience of affected marine life and should incorporate data sufficient to assess the affected species and manage fishing mortality to ensure little risk of depletion. Measures should be implemented and enforced to ensure that fishery mortality does not threaten the long-term productivity or ecological role of any species in the future.

Factors

Factor 3.1 Management Strategy and Implementation

Goal: Management strategy has a high chance of preventing declines in stock productivity by taking into account the level of uncertainty, other impacts on the stock, and the potential for increased pressure in the future.

Factor 3.2 Bycatch Strategy

Goal: Management strategy prevents negative population impacts on bycatch species, particularly species of concern.

Factor 3.3 Scientific Research and Monitoring

Factor 3.4 Enforcement of Management Regulations

Factor 3.5 Stakeholder Inclusion

Criterion 4 – Impacts on the Habitat and Ecosystem

Relevant Guiding Principles

Avoid negative impacts on the structure, function or associated biota of marine habitats where fishing occurs. The fishery does not adversely affect the physical structure of the seafloor or associated biological communities.

If high-impact gears (e.g. trawls, dredges) are used, vulnerable seafloor habitats (e.g. corals, seamounts) are not fished, and potential damage to the seafloor is mitigated through substantial spatial protection, gear modifications and/or other highly effective methods.

Maintain the trophic role of all marine life. All stocks are maintained at levels that allow them to fulfill their ecological role and to maintain a functioning ecosystem and food web, as informed by the best available science.

Do not result in harmful ecological changes such as reduction of dependent predator populations, trophic cascades, or phase shifts. Fishing activities must not result in harmful changes such as depletion of dependent predators, trophic cascades, or phase shifts.

This may require fishing certain species (e.g., forage species) well below maximum sustainable yield and maintaining populations of these species well above the biomass that produces maximum sustainable yield.

Ensure that any enhancement activities and fishing activities on enhanced stocks do not negatively affect the diversity, abundance, productivity, or genetic integrity of wild stocks. Any enhancement activities are conducted at levels that do not negatively affect wild stocks by reducing diversity, abundance or genetic integrity.

Management of fisheries targeting enhanced stocks ensure that there are no negative impacts on the wild stocks, in line with the guiding principles described above, as a result of the fisheries.

Enhancement activities do not negatively affect the ecosystem through density dependent competition or any other means, as informed by the best available science.

Follow the principles of ecosystem-based fisheries management. The fishery is managed to ensure the integrity of the entire ecosystem, rather than solely focusing on maintenance of single species stock productivity. To the extent allowed by the current state of the science, ecological interactions affected by the fishery are understood and protected, and the structure and function of the ecosystem is maintained.

Factors

Factor 4.1a Physical Impact of Fishing Gear on the Habitat/Substrate

Goal: The fishery does not adversely impact the physical structure of the ocean habitat, seafloor or associated biological communities.

Factor 4.1b Modifying Factor: Mitigation of Gear Impacts

Goal: Damage to the seafloor is mitigated through protection of sensitive or vulnerable seafloor habitats, and limits on the spatial footprint of fishing on fishing effort.

Factor 4.2 Ecosystem-based Fisheries Management

Goal: All stocks are maintained at levels that allow them to fulfill their ecological role and to maintain a functioning ecosystem and food web. Fishing activities should not seriously reduce ecosystem services provided by any retained species or result in harmful changes such as trophic cascades, phase shifts or reduction of genetic diversity. Even non-native species should be considered with respect to ecosystem impacts. If a fishery is managed in order to eradicate a non-native, the potential impacts of that strategy on native species in the ecosystem should be considered and rated below.

Aquaculture Criteria

Through eight criteria and fifteen associated factors we can assess the ecological sustainability of all aquaculture species and production systems at all scales from individual farms to regional, national and international industries. Two factors (3.3X and 6.2X) are exceptional factors that may not be relevant to all aquaculture production, yet can be a significant concern for those production practices where relevant. Whereas all other factors score positively and contribute to the overall score total, the exceptional factors are given a negative score which is subtracted from the final total score for those aquaculture operations where it is a concern.

Criterion 1 – Data

Relevant Guiding Principle

Having robust and up-to-date information on production practices and their impacts publically available. Poor data quality or availability limits the ability to understand and assess the environmental impacts of aquaculture production and subsequently for seafood purchasers to make informed choices. Robust and up-to-date information on production practices and their impacts should be publically available.

Factors

Factor 1.1 Data relevance

Confirm which data categories are relevant to the aquaculture operations being assessed.

Factor 1.2 Data quality

A measure of the availability and quality of relevant data.

Criterion 2 – Effluent

Relevant Guiding Principle

Not allowing effluent discharges to exceed, or contribute to exceeding, the carrying capacity of receiving waters at the local or regional level. Aquaculture farms minimize or avoid the production and discharge of wastes at the farm level in combination with an effective management or regulatory system to control the location, scale and cumulative impacts of the industry's waste discharges.

Factors

Factor 2.1 Waste discharged per ton of fish

A measure of the amount of waste discharged from the farm per ton of fish produced, using nitrogen as the most data-rich proxy indicator.

Factor 2.2 Management of farm-level and cumulative impacts

A measure of the presence and effectiveness of laws, regulations, management control measures, farm-level practices or eco-certification (appropriate to the scale of the industry) to limit the total discharge of wastes from farms and the cumulative impacts of aquaculture effluent from multiple farms to within the carrying capacity of the receiving environment.

Criterion 3 – Habitat

Relevant Guiding Principle

Being located at sites, scales and intensities that maintain the functionality of ecologically valuable habitats. The siting of aquaculture farms does not result in the loss of critical ecosystem services at the local, regional, or ecosystem level.

Factors

Factor 3.1 Habitat conversion and function

A categorical measure of habitat impact taking account of the ongoing functionality of affected habitats and the historic or ongoing nature of the habitat conversion for aquaculture.

Factor 3.2 Farm siting regulation and management

Ecosystem impacts are driven largely by the cumulative effects of multiple farms in a location, habitat type, region or a country, and on their separation distances, connectivity and overall intensity. This factor (3.2) is a measure of the presence and effectiveness of regulatory or management measures appropriate to the scale of the industry, and therefore a measure of confidence that the cumulative impacts of farms sited in the habitats declared in Factor 3.1 above are at appropriate spatial scales.

Criterion 4 – Chemical Use

Relevant Guiding Principle

Limiting the type, frequency of use, total use, or discharge of chemicals to levels representing a low risk of impact to non-target organisms. Aquaculture farms avoid the discharge of chemicals toxic to aquatic life or limit the type, frequency or total volume of use to ensure a low risk of impact to non-target organisms.

Factor

Factor 4.1 Evidence or risk of chemicals use

A measure of the likelihood of chemical use and discharge to the environment, taking account of the fundamentally poor availability of and low confidence in chemical use data.

Criterion 5 - Feed

Relevant Guiding Principle

Sourcing sustainable feed ingredients and converting them efficiently with net edible nutrition gains. Producing feeds and their constituent ingredients has complex global ecological impacts, and the efficiency of conversion can result in net food gains or dramatic net losses of nutrients. Aquaculture operations source only sustainable feed ingredients or those of low value for human consumption (e.g. by-products of other food production), and convert them efficiently and responsibly.

Factors

Factor 5.1 Wild fish use

A measure of the amount of wild fish used to produce farmed fish, combined with the sustainability of the fisheries from which they are sourced.

Factor 5.2 Net protein gain or loss

A measure of the net protein efficiency of the fish farming process based on the edible protein inputs and the utilized protein outputs.

Factor 5.3 Feed footprint

An approximate measure of the global resources used to produce aquaculture feeds based on the global ocean and land area used to produce the feed ingredients necessary to grow one ton of farmed fish.

Criterion 6 – Escapes

Relevant Guiding Principle

Preventing population-level impacts to wild species or other ecosystem-level impacts from farm escapes. Aquaculture farms, by limiting escapes or the nature of escapees, prevent competition, reductions in genetic fitness, predation, habitat damage, spawning disruption, and other impacts on wild fish and ecosystems that may result from the escape of native, non-native and/or genetically distinct farmed species.

Factors

Factor 6.1 Escape Risk Score

A measure of the escape risk (for the species being farmed) inherent in the production system, accounting for improvements in production system technology and management techniques when these changes have demonstrably resulted in low or no escapes.

Factor 6.2 Invasiveness

A trait-based measure of the likelihood of genetic and/or ecological disturbance from escapees based on their native or non-native status, and/or their domestication and ecological characteristics.

Criterion 7 – Disease, Pathogen and Parasite Interaction

Relevant Guiding Principle

Preventing population-level impacts to wild species through the amplification and retransmission, or increased virulence of pathogens or parasites. Aquaculture farms pose no substantial risk of deleterious effects to wild populations through the amplification and retransmission of pathogens or parasites, or the increased virulence of naturally occurring pathogens.

Factor

Disease, pathogen and parasite interaction

A measure of the infection risk between farm and wild populations, assuming that farms, by their nature, typically act as amplifiers of local naturally occurring and introduced pathogens and parasites.

Criterion 8 – Source of Stock – Independence from Wild Fish Stocks

Relevant Guiding Principle

Using eggs, larvae, or juvenile fish produced from farm-raised broodstocks thereby avoiding the need for wild capture. Aquaculture farms use eggs, larvae, or juvenile fish produced from farm-raised broodstocks thereby avoiding the need for wild capture, or where farm-raised broodstocks are not yet available, ensure that the harvest of wild broodstock does not have population-level impacts on affected species. Wild-caught juveniles may be used from passive inflow, or natural settlement.

Factor

Independence from wild capture fisheries

A measure of the aquaculture operation's independence from active capture of wild fish for on-growing or broodstock.

Criterion 9X – Predator and wildlife mortalities

Relevant Guiding Principle

Preventing population-level impacts to predators or other species of wildlife attracted to farm sites. Aquaculture operations use non-lethal exclusion devices or deterrents, prevent accidental mortality of wildlife, and use lethal control only as a last resort, thereby ensuring any mortalities do not have population-level impacts on affected species.

Factor

Predator and wildlife mortalities

A measure of the mortality of predators or other wildlife caused or contributed to by farming operations

Criterion 10X – Escape of unintentionally introduced species

Relevant Guiding Principle

Avoiding the potential for the accidental introduction of non-native species or pathogens during the shipment of live animals. Aquaculture farms avoid the international or trans-waterbody movements of live animals, or ensure that either the source or destination of movements is biosecure in order to avoid the introduction of unintended pathogens, parasites and invasive species to the natural environment.

Factors

Factor 10Xa – International or trans-waterbody animal shipments

Approximate percentage of production reliant on the ongoing international or trans-waterbody movement of broodstock, eggs, larvae, or juveniles within one generation of the farmed product, or the transport of unprocessed feed.

Factor 10Xb – Biosecurity of source and destination (for introduced species)

Scoring Methodology

Seafood Watch scores are based on robust scientific evidence where possible and reflect the conservation ethic of the Seafood Watch program. There are numerous calculations in different criteria and factors for both fisheries and aquaculture assessments, all of which are handled automatically by our Seafood Watch Assessment Tool (see below). The overall scoring and final rating is intuitive, simple and transparent, and maps to the basic Seafood Watch format of a Green “Best Choice”, Yellow “Good Alternative” and Red “Avoid”. The final rating is a function of the final numeric score and a set of decision rules as detailed in our [standards](#), and summarized here:

Rating	Fisheries	Aquaculture	Explanation
Best Choice	Final Score >3.2, and either Criterion 1 or Criterion 3 (or both) is Green, and no Red Criteria, and no Critical scores	Final Score >6.6, and no Red Criteria, and no Critical ³ scores	Wild-caught and farm-raised seafood on the “Best Choice” list are ecologically sustainable, well managed and caught or farmed in ways that cause little or no harm to habitats or other wildlife. These operations align with all of our guiding principles.
Good Alternative	Final score >2.2, and no more than one Red Criterion, and no Critical scores, and does not meet the criteria for Best Choice (above)	Final score >3.3 and <6.6, and no more than one Red Criterion, and no Critical scores.	Wild-caught and farm-raised seafood on the “Good Alternative” list cannot be considered fully sustainable at this time. They align with most of our guiding principles, but there is either one conservation concern needing substantial improvement, or there is significant uncertainty associated with the impacts of this fishery or aquaculture operations.
Avoid	Final Score <=2.2, or two or more Red Criteria, or one or more Critical scores.	Final Score <3.3, or two or more Red Criteria, or one or more Critical scores.	Wild-caught and farm-raised seafood on the “Avoid” list are caught or farmed in ways that have a high risk of causing significant harm to the environment. They do not align with our guiding principles, and are considered unsustainable due to either a critical conservation concern, or multiple areas where improvement is needed.

Seafood Watch Assessment Tool

In 2013 we launched a web-based Seafood Watch Assessment Tool (SWAT) that automatically calculates overall scores and ratings. The tool allows us to generate, update and deliver Seafood Watch reports (the summary of our seafood assessments) more efficiently and with greater transparency. SWAT is now accessible to various stakeholders, internal and external, at different times in the process via a web interface <http://swat.seafoodwatch.org/>.

What is SWAT and who can use it?

SWAT puts the process of generating Seafood Watch reports, including gathering expert input, and conducting internal and external peer reviews into an online platform. Within SWAT an online report template standardizes data collection and synthesis, allows for more efficient reviews and automates report scoring.

Users can employ SWAT in different ways. Members of the public who want to provide data for existing or future Seafood Watch reports may do so at any time by visiting the SWAT homepage. The homepage also serves as the portal from where report authors and reviewers can access their assigned report. External analysts and reviewers have access to reports that are currently in progress (including updates to published reports) only with permission of Seafood Watch. Experts with an interest in peer reviewing a report that is underway can contact [Seafood Watch](#) for more information.

What are the benefits of SWAT?

The benefits of SWAT include increased stakeholder engagement, streamlining of the report process, increased data and scoring consistency between reports, better data management through automatic notification of events (i.e. updates, expiry dates etc), and increased ease in updating existing reports. For our NGO colleagues, access to in-progress reports provides an expanded comment period.

Seafood Watch Assessment Process

Scope of Assessments

Seafood Watch assesses the ecological impacts on marine and freshwater ecosystems of fisheries and aquaculture operations up to the dock or farm gate. Seafood Watch assessments do not consider all ecological impacts (e.g. land use, air pollution), post-harvest impacts such as processing or transportation, or non-ecological impacts such as social issues, human health or animal welfare.

Fisheries

Fisheries assessments generally focus on a single fishery, as defined by region and target species (which may include multiple target species, in the case of a multispecies fishery). A single assessment may contain multiple recommendations to address different gear types, biological stocks, or regional variations in ecological impacts and management, as needed. In a few cases, an assessment may focus on a subset of a fishery. These cases include:

- If a portion of a fishery is eco-certified to a standard that benchmarks to equivalent to Seafood Watch yellow or better, we may create an assessment that addresses only the uncertified portion of the fishery. The certified portion will be listed separately on our website.

- If an [External Assessment](#) is requested for a subset of a fishery, we may perform an assessment covering that subset, provided that it is not already eco-certified to a standard that benchmarks to equivalent to Seafood Watch yellow or better. Please note, even in cases where the scope of an assessment covers a subset of a fishery, we still require that the assessment considers fishing mortality (for all species, target and bycatch) from the entire fishery, as well as the cumulative effect of fisheries mortality from other fisheries.

Aquaculture

The standards are designed to be utilized at any scale, from a single farm to a whole aquaculture sector. However, Seafood Watch focuses on providing assessments at the country/region level (see exceptions below). The benefit of such an approach is that we can better capture the cumulative impacts of aquaculture in a region. We do recognize that this approach may not reflect the efforts of the best performing farms and therefore have a program whereby third-parties (i.e. a farm) can self-fund an individual assessment using our [External Assessment Program](#). Furthermore, Seafood Watch has benchmarked key seafood eco-certification programs which will enable us to recommend farms that are certified by standards found to be equivalent to at least a “Good Alternative” (yellow).

Seafood Watch will assess at the “farm level” if one of the following conditions is met:

- It is the only farm producing a species in a country for which we want a species-country recommendation;
- Production from a country into the U.S. market for which we want a species-country recommendation is dominated by a single farm;
- We can only get data from a single farm.

Seafood Watch will not assess at the farm-level when:

- We already have a country-species assessment;
- It is a single farm in a country where we don’t have a species-country assessment and it is not on our priority list;
- The farm is certified by an equivalent eco-certification standard.

Prioritizing Assessments

In the United States alone there are 715 commercially fished species. Global capture fisheries production in 2008 was about 90 million tons originating from many thousands of fisheries. In addition, global aquaculture production in 2008 was approximately 50 million tons with production originating from every continent except Antarctica. In fact, the United States imports 91% of its seafood, about half of which is from aquaculture.

The program can maintain a limited number of Seafood Watch assessments, the scope of which varies from assessments of individual to multiple fisheries and farms, typically yielding multiple Seafood Watch recommendations. To ensure we best utilize our resources and focus on the most relevant species we conduct a prioritization exercise each fall to determine the top priority assessments that we will be assessing in the next year. This process incorporates:

- needed updates of our current assessments (so our assessments are always up-to-date),
- production and trade statistics and commissioned national market research (to determine overall market importance),
- internal regional market research (to identify top sources in regional markets),

- data on which sources are eco-certified to a standard equivalent to at least a Good Alternative (based on our eco-certification [benchmarking work](#)),
- feedback on priorities from our strategic business partners, conservation partners, chefs and the public.

We also include a wildcard element to capture unforeseen and otherwise exceptional priorities.

Following selection of the priority Seafood Watch assessments, we establish expiration dates to determine the order in which individual assessments need to be updated. All assessments have a three-year expiration date (four years for fisheries) by default but can be changed according to the individual circumstances of each report. If we become aware of data or information that suggests our overall rating is no longer current (through public comment or our active review of stock assessment updates, for example), the affected assessment will be considered a high priority for update before the expiration date.

Recruiting Assessors

Seafood Watch currently works with around 50 contract Assessors. The basic requirements for Seafood Watch Assessors are as follows:

- Ideal candidates should have, or be working towards, a Masters or PhD in fisheries science, aquaculture, marine ecology, or have equivalent experience/ education in the field.
- Proficiency with Microsoft Word/ Excel and online scientific literature review is mandatory.
- Outstanding written and verbal communication skills in English are critical.

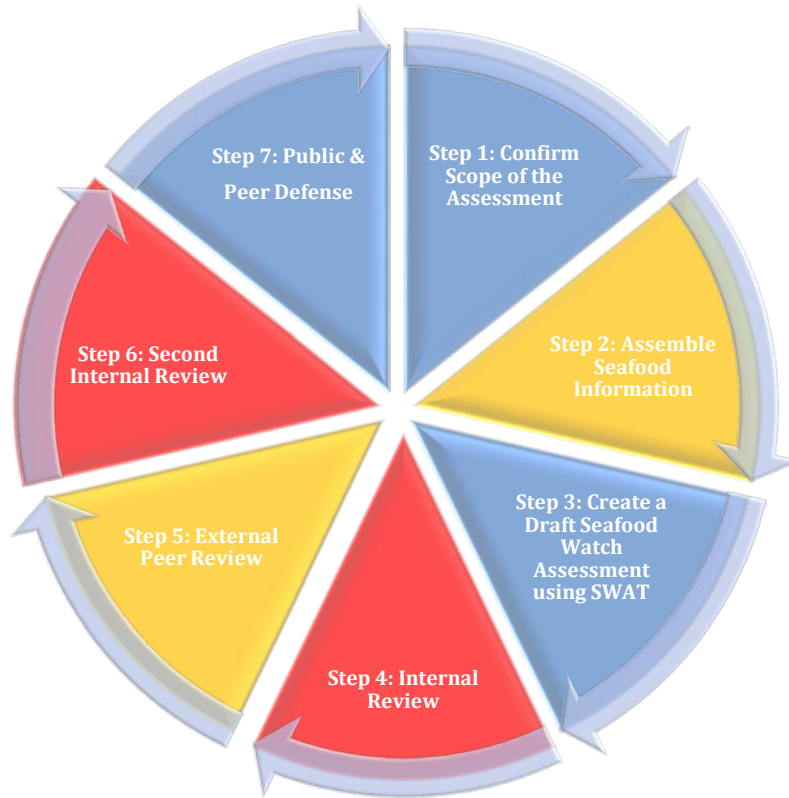
Training Assessors

The training program for Seafood Watch Assessors begins with a webinar on the program, the assessment process and the standard they'll be using, and culminates with the completion of their first assessment. The full program is illustrated in the diagram below.



Assessment Process for Fisheries and Aquaculture Operations

The process by which we draft Seafood Watch assessments and generate seafood recommendations is summarized in the flowchart below. Most of the work is conducted by the Assessor (blue slices), but all assessments are reviewed by staff or a trained Reviewer (red slices), and all undergo considerable external review (yellow slices) from experts in the fishery or aquaculture operation.



Step 1: Confirm scope of the assessment

Each Seafood Watch assessment has a profile created on the Seafood Watch Assessment Tool reflecting the initial outline of fisheries or aquaculture operations to be assessed, generally including the species or stock of interest, the harvest method or production system and region. The researcher confirms the scope of work based on what is actually available on the US/North American market (or likely will be, if forecasts are available). For fishery assessments specifically it may also be appropriate to include other species if they are caught in the same fishery(s) and are also available on the US/North American market.

Step 2: Assemble Seafood Information

A robust Seafood Watch assessment is dependent on the researcher obtaining the most up-to-date and relevant information available from both literature and relevant experts.

Literature we use includes: peer-reviewed published scientific papers, national and regional management agency publications and scientific committee reports, the United Nations Food and Agriculture Organization reports, independent certification organizations and other relevant government documents or websites. Seafood Watch also uses data and information from industry and conservation groups. However, all claims by these latter sources

are substantiated by independent, third party verification where possible, and used with an appropriate level of caution when not.

Seafood Watch also works with key experts to compensate for the lag time in published data reflecting the most up-to-date information and/or when there are gaps or conflicting data. Experts can include academic and government scientists, resource managers, members of the fishing, aquaculture, and seafood industries and non-governmental organizations.

Step 3: Create a Draft Seafood Watch Assessment using SWAT

The entire process for drafting, reviewing and peer reviewing fisheries assessments is conducted via the [Seafood Watch Assessment Tool](#). The tool streamlines the assessment process by integrating the Seafood Watch assessment criteria, data input, scoring calculations and review into a web-based interface. Data are entered into the SWAT using a linear process that is assisted by detailed guidance on our standard.

Step 4: Internal Review

Seafood Watch science team members login to SWAT to conduct an internal review of the first draft to ensure all relevant sections are completed, all information is referenced, all scores and final recommendations agree with the data, and the appropriate information has been utilized. We also review for scientific rigor, correct interpretation of the criteria and consistency with existing Seafood Watch assessments to ensure it meets Seafood Watch criteria. The researcher makes any revisions as necessary and the review cycle continues until Seafood Watch approves the draft for external peer review.

Step 5: External Peer Review

Peer review is essential to ensure scientifically robust assessments based on appropriate interpretation of the most up-to-date data and information available for the species in question. Seafood Watch assessments must be peer reviewed by at least three scientists with expertise in the species. These experts are drawn from government, academia, the conservation community, and the seafood industry. Peer review is conducted via SWAT so that Seafood Watch can monitor the process and ensure that the researcher addresses the comments and makes revisions if warranted.

Step 6: Second Internal Review

Internal staff or a trained reviewer reads through the expert comments and provides guidance to the assessor in how to address them, as appropriate. The reviewer also ensures relevant expert comments are incorporated into the final draft.

Step 7: Public and Peer Defense

Reviewed Seafood Watch assessments and the ensuing recommendations are formally presented (typically via webinar) to Seafood Watch staff and partner environmental organizations⁴. This step provides our outreach staff and partners with the opportunity to interact with the analyst and more fully understand the recommendations. If

⁴ These organizations are those that use Seafood Watch recommendations in their outreach to consumers and business partners. Attendees from these organizations observe to become better acquainted with the recommendations as they will utilize the information to inform their work.

any significant issues, questions, or comments arise that cannot be adequately addressed, a subsequent session will be held to address these.

Publish Official Seafood Watch Assessment and Recommendation

Each Seafood Watch assessment generated on SWAT is copy-edited and published online at www.seafoodwatch.org.

Seafood Eco-certification Programs

We strongly support the concept of independent eco-certification programs for seafood. In 2012, we completed a comprehensive study of 10 eco-certification programs to determine if any had standards equivalent to our own sustainability criteria. As a result of this study, we can now recommend that seafood buyers look for the eco-certified seafood products [on our website](#), in addition to choosing from our "Best Choices" and "Good Alternatives" lists. We identified these standards as equivalent to at least our yellow "Good Alternative" recommendation.

Document Update History

January 2017 (this document): Updated scope of fisheries assessments. Also, the guiding principles regarding greenhouse gas emissions have been removed to be consistent with the revised Standard for Wild Fisheries and Standard for Aquaculture, and other documents. Text added to state that fisheries reports have a default four-year expiration date.