

ROADMAP TOWARDS SUSTAINABLE FARMED SHRIMP: A GUIDE FOR RETAILERS

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“Roadmap Towards Sustainable Farmed Shrimp: A Guide for Retailers” was created by Environmental Defense Fund, FishWise, and the New England Aquarium, in consultation with a broad number of conservation organizations as well as several seafood industry groups. The Roadmap is intended to educate retailers on how to work toward procuring sustainably farmed shrimp. It is not a set of standards or best practices, but may be used to complement existing corporate commitments to aquaculture certification or as an introductory document for those businesses not yet engaged in sourcing sustainably farmed shrimp.

Shrimp is the most popular seafood in the U.S. It accounts for 25% of seafood sales nationally, an estimated three quarters of which is farmed and 80% of which is imported. Production practices in some regions of the world have had significant environmental impacts, including the destruction of important habitats, water pollution, and a heavy use of wild fish for shrimp feed. Health concerns have focused on the frequent use of drugs and other chemicals in some operations, and the presence of illegal drug residues in some farmed shrimp. These impacts and concerns, however, can be addressed with existing technology and improvements to current practices. This document presents a roadmap for seafood buyers who desire to source farmed shrimp that makes significant environmental gains over current practices. The roadmap is intended to provide a set of chronological steps that clearly identifies short, medium and long-term actions for sourcing environmentally friendly farmed shrimp. None of the steps should be considered an end-point on their own, but, instead, be part of an ongoing process to encourage continuous improvement in the shrimp farming industry.

While it is possible for a seafood buyer to embark on this path alone, a knowledgeable environmental partner or group of partners can assist in implementing different steps. If you do not currently have an environmental partner, you can contact the Seafood Choices Alliance (info@seafoodchoices.org; www.seafoodchoices.org) for suggestions of organizations that might be appropriate for helping you.

Step 1: Establishing Supply Knowledge and Traceability

1. Identify your current shrimp supply chain (e.g., volumes purchased, companies involved, etc.) and sourcing policies (i.e., any required certifications or a purchasing standard). Determine the chain of custody and level of traceability by looking at your records and establishing whether products can be tracked back to the farm or even to the ponds.
2. Utilize the “Questions to Ask Suppliers and Producers” document (see appendix) or a comparable data collection document, to access additional producer data.
3. Request general and site-specific data from your producer to identify key areas of good performance and areas for improvement.
4. Verify producer data on environmental impact through a qualified assessor with expert knowledge in shrimp farming.

Step 2: Creating the Steps for a Public Commitment

1. Devise an Action Plan that includes goals and an implementation strategy.
 - a. Define the role you wish to play in improving the environmental performance of farmed shrimp products. For example, are you committed to making a complete switch in species, sources or producers or invest time working with your current suppliers to make improvements? Establish the level of support for the program; does this have CEO buy in or is it a department-led initiative? Is this a public, marketed activity or an internal pursuit?
 - b. Decide whether to work with an environmental partner(s), business partner(s), consultants or rely on internal expertise. An environmental partner, such as an environmental non-governmental organization, may have substantial experience in this area and be able to offer support, guidance and assessment capabilities.
 - c. Include specific goals and timeframes for improvement. Effective Action Plans may include several of the mechanisms below.

Procurement:

 - i. Develop an overarching purchasing policy that requires suppliers to meet certain performance-based standards or management practices.
 - ii. Switch to producers already working toward environmentally preferable practices, or to those who are appropriately certified.
 - iii. Focus any marketing of shrimp products on environmentally responsible products and eliminate marketing on less environmentally responsible alternatives
 - iv. Phase out producers and suppliers that do not improve their environmental performance.

Reform

 - v. Develop farm assessment tools specific for the producer or encourage higher standards from current assessment tools.
 - vi. Perform and document site-by-site assessment of all farmed shrimp producers, identify areas of improvement and work with current producers toward environmentally preferable practices.
 - vii. Identify opportunities for quantifiable change, such as obtaining appropriate certifications and/or meeting performance-based standards.
 - viii. Take an active role in industry improvement-related activities, such as public comment periods for certification schemes or participation in the WWF-facilitated Aquaculture Dialogues (www.worldwildlife.org/shrimpdialogue).
2. Commit to implementing your Action Plan: State the goals, commit to deadlines and identify critical quantifiable indicators of progress (e.g. a 15% increase in purchasing chemical-free shrimp).
3. Be transparent: make your goals and timeline publicly available, release an annual status report that summarizes planned actions and goals achieved, and make sustainability information regarding your shrimp easily accessible to customers and other interested parties.

Step 3: Achieving Change and Improving Performance

1. Implement the Action Plan.
2. Explain to your staff the reasons for your commitment towards the sustainable farmed shrimp roadmap and keep them updated of ongoing progress.
3. Educate your customers about the key issues, the actions being taken, and achievements using quantifiable statements where possible. Help consumers make informed decisions by training sales staff and using tools such as promotions, pamphlets, signage etc.
4. Educate your producers (and any others that approach you) about the Action Plan, their role within it and the goals you want to achieve. Direct them to resources that will enable them to get background on the issues and potential solutions to the problems involved.
5. Monitor progress
 - a. Monitor continual improvement by requiring regular performance data from the producer (see appendix "Questions to Ask Suppliers and Producers"). Ensure these data are collected using a standardized approach and set appropriate timelines with the producer up front.
 - b. Set appropriate timelines for appointments to discuss progress with producers, environmental partners and other stakeholders to maintain the Action Plan and assess its effectiveness. Be upfront about what is expected and when.
 - c. If working with independent party, such as an environmental partner, have them verify improvements and review performance data.
6. Upon the completion of a target or goal or at the end of a set time period (e.g. annually), review the Action Plan, and discuss with suppliers and other parties the successes and failures of each point. Make changes if inadequate progress is being made and establish new targets and goals where necessary.

Appendix

QUESTIONS TO ASK SUPPLIERS AND PRODUCERS

(*Note: These questions are intended to provide guidance for buyers to solicit information from farmed shrimp producers and suppliers with the intention of establishing a better understanding of existing practices in farmed shrimp production. It is also an attempt to establish baselines and standardize the type of data needed to conduct environmental assessments of farmed shrimp operations. Producer questions are intended to be applied at the individual farm level.)

SUPPLIER POLICIES AND PROGRAMS:

- Do you have a sourcing policy with regards to obtaining shrimp, such as required certification or production standards? How are these enforced?
- Which certifications do you require?
- Do you require site visits and inspections? If so, who conducts the inspections and how are they conducted?
- Do you have a person responsible for sustainability reporting to executive management about progress meeting the company's commitment?
- Can you identify the chain of custody for each product from the farm (pond level) to the supplier? If so, how and in what format are the data?
- What % of the supply is from vertically integrated farms?
- Is there potential for a retailer-specific sourcing policy?

PRODUCER QUESTIONS (Note: Farms should complete individually)

General Information:

- Name of farm and contact person.
- Which species of shrimp do you farm?
- What is the annual production of the farm? What % are sold to the supplier?
- At what density are post larvae stocked and at what stage (e.g. Nauplii, mysis, PL3, 6 or 12, etc.)?
- What is the general size and depth of grow-out ponds (include range)?
- How many times do you feed the shrimp daily? Is this considered largely supplemental?
- Intensity of production (e.g., extensive, semi-intensive, intensive, super-intensive)?
Intensity defined as: (Choose best fit)

Extensive	Semi-Intensive	Intensive	Super-Intensive
<ul style="list-style-type: none"> ○ PL stocked 4-10/m² ○ 5-10 hectare ponds ○ Little or no aeration ○ Natural pond with/without supplemental feed (1x/day) ○ Tidal influence (no water exchange or minimal pumping) 	<ul style="list-style-type: none"> ○ PL stocked 10-30/m² ○ 1-5 hectare ponds ○ Minimal aeration ○ Regular pumped water exchange ○ Supplemental feeding (2-3x/day) 	<ul style="list-style-type: none"> ○ PL stocked 60-300m² ○ 0.1-1 hectare ponds ○ Heavy aeration ○ Deeper ponds (>1.5m) ○ High water exchange ○ High feeding rates (2-5x/day) ○ Including bio-floc systems 	<ul style="list-style-type: none"> ○ High stocking density (300-450 juveniles/m²) ○ Enclosed, biosecure indoor raceway systems (e.g., Recirculating Aquaculture System) ○ No water exchange and/or limited discharge

Source: FAO 2008 (http://www.fao.org/fishery/culturedspecies/Litopenaeus_vannamei/en)

- What sizes of shrimp do you produce? What is the yield volume per size category as a proportion of the whole?
- Do you have rights to your land through ownership or a legal lease?
- What are the legal requirements to a shrimp farm in the area? Do you require a discharge permit or a license to farm? If so, when does this lease expire?
- If national or local rules require you to submit data on environmental factors, please provide copies of these data?
- Is the farm part of a cluster of farms or part of any local farming groups?
- Is the farm certified under any third-party certification schemes (organic labels such as Naturland, Bio Suisse and/or other labels such as BAP certified, GlobalGAP etc)?
- If yes...
 - By whom are you certified? Provide contact information of certifier and certification number
 - Identify which components are certified by whom (i.e. who certifies the farms, who certifies the processing plant, etc.).
 - Does this certification carry chain of custody?
 - How long has the farm been certified?
 - When is your certification up for review?
 - If not yet certified, at what point in the certification process is your farm?
- If no....
 - Are any other traceability systems in place, and what detail to they provide?
- Are the farms part of a vertically integrated system? Which parts of the system do you own (hatchery, processing plant, farm only, feed mill, etc.)?
- What are your ponds made of? How are they lined? What actions have you taken to prevent leaks, seepage or discharge? Do you collect data to ensure that wells and groundwater are not salinized?
- If your farm(s) is located in a coastal area, is there a safety mechanism in place should severe inclement weather or storms threaten the area?
- Do you remove pond sediments? If so, how are the sediments removed and where are they disposed of? In the disposal area what measures are taken to prevent saline contamination?
- Are saline pond effluents released directly into freshwater resources, such as rivers?
- Are saline pond effluents or sediments are disposed of or released onto agricultural land?

Siting:

- Provide the GPS coordinates and maps for your farm(s).
 - If near a coastal system, mark the high tide line on the map.
 - If near on previously on mangroves or sensitive wetlands, mark the areas where these areas are/were. (See Addendum: Ramsar Classification System for Wetland Types for definitions)
 - Include details on the flow of water through the system with pond and farm inlets and outlets marked, along with farm structures and pumping stations. If supply will only come from certain ponds, mark them on the map.
 - If near or on an area of critical biodiversity importance such as Ramsar sites, Birdlife International IBA (Important Bird Area) sites or AZE (Alliance for Zero Extinction) sites or similar local, state, or international designation, mark the boundaries on the map.

- If water sampling is performed, mark on the map the sites sampled (please include a reference so the data can be linked to the sample site).
- When was the site established?
- What were the historical land uses before becoming a shrimp farm?
- If you purchased a pre-built farm, when did you take ownership?
- Where is your farm within the tidal zone or how far is it from the tidal zone?
- Is it on a wetland? Include types and % coverage of each if appropriate (see Addendum: Ramsar Classification System for Wetland Types for definitions)
- Is there an intake system from riparian / coastal water systems?
- Is the farm located in or obstructing access to traditional fishing grounds or important economic areas? If so, what systems have you introduced to minimize these impacts (e.g. paths for fishermen across farm)?
- Was there an environmental impact assessment performed at the site of the pond, farm, or processing facility? If so, is this report publicly available?
- Was the farm sited on any mangrove forests, other wetlands, or areas of critical biodiversity importance? If so, were any corrective actions taken, such as restoration, to mitigate this destruction? Include size and location of areas impacted and please indicate if any monitoring exists.
- Is there a contingency plan for the occurrence of any environmental/biological mishaps?
- Are there any other monitoring programs for biodiversity or the environment around the farms? Please state if these are voluntary or required by law and how they are evaluated.
- What steps are taken to prevent erosion of pond dikes, what percentage of pond dike is lost to erosion annually?

Water Quality:

- What is your daily water exchange rate? When/how frequently are ponds drained?
- What is the water source for your ponds?
- Is the water quality of the ponds monitored? Please detail the parameters monitored and the corrective action taken to respond to decreasing water quality (e.g. turning on aerators in low dissolved oxygen events).
- Do you use aerators, if so what percentage of time are they run through the grow-out period?
- Do you test your inlet water? For what parameters? Provide details on any pre-treatments to inlet water including treatment name, quantity of product used, and storage methods.
- Is the effluent treated? How (e.g., settling pond/artificial wetland/recirculating system)?
- Do you use your effluent for agricultural purposes?
- Provide data on total suspended solids, five-day biochemical oxygen demand, soluble phosphorous, and salinity or total ammonia nitrogen for effluent leaving the site especially related to the characteristics of incoming source water.
- How have these data changed over time?

Feed:

- What feed do you use for the grow-out portion of the farm? If formulated feed, identify the producer and feed type.
- What is the FCR?
- What is the composition of the feed? Specify the fish meal and fish oil inclusion rates, as well as other animal protein sources.
- What are the species used for the fish meal and fish oil? Where were these species fished from? Please indicate the percentages of each.

- Do you fertilize the pond to increase natural production? If so, what do you use and how much do you apply (this can include polyculture with waterfowl)?
- Do you employ a feed monitoring system, such as using only feeding trays? Please describe the system and how the results are used.
- What is the fate of shrimp processing wastes, for example disposal by burial or conversion into shrimp head meal?

Disease history and treatments:

- Describe the disease history for at least the last 3 years. Include details on disease, % of production affected, % mortality attributed to it, treatments used, and if a chemical was applied, the type, volume used and whether it was veterinarian prescribed.
- If disease reporting is a government requirement, please provide copies of the disease reports.
- What other chemicals are used on site? Include name, reason and volumes used.
- Are any chemicals used prophylactically? If so, which ones?
- Do you conduct regular health assessments on the shrimp? If so, what is considered and how often are the assessments conducted?
- Do you use probiotic bacteria or bio-floc in the system? If so, is the bacteria native or introduced (or brand name)? Is bacteria sampled in the effluent waters and what systems are employed to prevent escape? How are the probiotics added to the system (e.g. mixed with wheat and molasses, etc.)?
- Describe the farms biosecurity systems.
- Do you fallow or sterilize ponds at the end of the production cycle? If so, how?

Seed:

- Are the seed used wild caught or hatchery-raised? If hatchery-raised, give the name, location and contact information of supplier.
- Are they certified Specific Pathogen Resistant (SPR) or SPF (Specific Pathogen Free)?
- If wild caught, are they screened for disease, evaluated for health or treated in anyway prior to introduction to the system? Are they from a targeted fishery or bycatch* from another fishery? What is the bycatch of these collection methods? What is the conservation status of these populations as well as the wild shrimp populations?
(*Bycatch is defined as "part of a catch of a fishing unit taken incidentally in addition to the target species towards which fishing effort is directed. Some or all of it may be returned to the sea as discards, usually dead or dying." (<http://www.fao.org/fi/glossary/>))

Impacts on other Species:

- Are the species cultured native, widely farmed locally, or non-native to the area?
- Do you farm genetically engineered shrimp?
- In the past 5 years, describe the number of escape incidents (include any required governmental reports on the escape, if required).
- What systems are in place to prevent escapes at the farm?
- What are the main nuisance predators at the farm? How are they controlled?
- What form of predator control is used? If destructive methods for predator control are employed, what species and numbers were killed in the last three years and by which control method?
- Are there any threatened or endangered species in the local area?
- Do you need a license for these methods, and do you have one?

Social concerns:

- Is the farm located in or obstructing access to traditional fishing grounds or important economic areas? If so, what systems have you introduced to minimize these impacts (e.g. paths for fishermen across farm)?
- Is the farm involved with any community projects such as building and/or operating schools, orphanages, etc.? Please describe these in detail.
- What is the ownership/management structure of the farm (locally owned, cooperative, conglomerate, etc.)?
- Please detail any other social issues or conflicts that are currently unresolved?

Food Safety History:

- Have any imports from the farm to the US been rejected by the FDA in the past 5 years? If so, please explain each incident and detail any subsequent corrective action taken by the farm.

Additional Information:

Please include any other information that would help determine the environmental performance of the farms, etc.

Feedback:

Please make any comments as to how these questions could be improved.

Addendum: Ramsar Classification System for Wetland Type

(source: <http://www.fao.org/docrep/003/X6611E/x6611e03d.htm>)

Marine/Coastal

- A. Permanent shallow marine waters less than six metres deep at low tide; includes sea bays and straits.
- B. Marine subtidal aquatic beds; includes kelp beds, sea-grass beds, tropical marine meadows.
- C. Coral reefs.
- D. Rocky marine shores; includes rocky offshore islands, sea cliffs.
- E. Sand, shingle or pebble shores; includes sand bars, spits and sandy islets; includes dune systems.
- F. Estuarine waters; permanent water of estuaries and estuarine systems of deltas.
- G. Intertidal mud, sand or salt flats.
- H. Intertidal marshes; includes salt marshes, salt meadows, saltings, raised salt marshes; includes tidal brackish and freshwater marshes.
- I. Intertidal forested wetlands; includes mangrove swamps, nipah swamps and tidal freshwater swamp forests.
- J. Coastal brackish/saline lagoons; brackish to saline lagoons with at least one relatively narrow connection to the sea.
- K. Coastal freshwater lagoons; includes freshwater delta lagoons.

Inland Wetlands

- L. Permanent inland deltas.
- M. Permanent rivers/streams/creeks; includes waterfalls.
- N. Seasonal/intermittent/irregular rivers/streams/creeks.
- O. Permanent freshwater lakes (over 8 ha); includes large oxbow lakes.
- P. Seasonal/intermittent freshwater lakes (over 8 ha); includes floodplain lakes.
- Q. Permanent saline/brackish/alkaline lakes.
- R. Seasonal/intermittent saline/brackish/alkaline lakes and flats.*
- Sp. Permanent saline/brackish/alkaline marshes/pools.
- Ss. Seasonal/intermittent saline/brackish/alkaline marshes/ pools.*
- Tp. Permanent freshwater marshes/pools; ponds (below 8 ha), marshes and swamps on inorganic soils; with emergent vegetation water-logged for at least most of the growing season.
- Ts. Seasonal/intermittent freshwater marshes/pools on inorganic soil; includes sloughs, potholes, seasonally flooded meadows, sedge marshes.*
- U. Non-forested peatlands; includes shrub or open bogs, swamps, fens.
- Va. Alpine wetlands; includes alpine meadows, temporary waters from snowmelt.
- Vt. Tundra wetlands; includes tundra pools, temporary waters from snowmelt.
- W. Shrub-dominated wetlands; Shrub swamps, shrub-dominated freshwater marsh, shrub carr, alder thicket; on inorganic soils.*
- Xf. Freshwater, tree-dominated wetlands; includes freshwater swamp forest, seasonally flooded forest, wooded swamps; on inorganic soils.*
- Xp. Forested peatlands; peat swamp forest.*
- Y. Freshwater springs; oases.
- Zg. Geothermal wetlands.
- Zk. Subterranean karst and cave hydrological systems.

* As appropriate, includes: floodplain wetlands such as seasonally inundated grassland (including natural wet meadows), shrublands, woodlands or forest.