

FISHERY ASSESSMENT REPORT

IFFO GLOBAL STANDARD FOR RESPONSIBLE SUPPLY OF FISHMEAL AND FISH OIL



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|------------------------|--|
| FISHERY: | Atlantic menhaden (<i>Brevoortia tyrannus</i>) |
| LOCATION: | USA (Virginia, New Jersey, North Carolina) |
| DATE OF REPORT: | August 2015 |
| ASSESSOR: | Sam Peacock |

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| 1. APPLICATION DETAILS AND SUMMARY OF THE ASSESSMENT OUTCOME | | | |
|--|---------------|---|---|
| Name: | | | |
| Address: | | | |
| Country: | | Zip: | |
| Tel. No. | | Fax. No. | |
| Email address: | | Applicant Code | |
| Key Contact: | | Title: | |
| Certification Body Details | | | |
| Name of Certification Body: | | Global Trust Certification Ltd. | |
| Assessor Name | Peer Reviewer | Assessment Days | Initial/Surveillance/ Re-certification |
| Sam Peacock | Deirdre Hoare | 1 | Surveillance |
| Assessment Period | August 2015 | | |
| | | | |
| Scope Details | | | |
| 1. Scope of Assessment | | IFFO Global Standard for Responsible Supply – Issue 1 | |
| 2. Fishery | | Atlantic menhaden (<i>Brevoortia tyrannus</i>) | |
| 3. Fishery Location | | USA (Virginia, New Jersey, North Carolina) | |
| 4. Fishery Method | | Purse seine | |
| Outcome of Assessment | | | |
| 5. Overall Fishery Compliance Rating | | High | |
| 6. Sub Components of Low Compliance | | None | |
| 7. Information deficiency | | None | |
| 8. Peer Review Evaluation | | Approve | |
| 9. Recommendation | | Maintain fishery approval | |

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| 2. QUALITY OF INFORMATION |
| Good; primarily ASMFC and SEDAR reports and websites |
| 3. COMPLIANCE LEVEL ACHEIVED |
| High |
| Recommendation |
| Maintain fishery approval. |
| 4. GUIDANCE FOR ONSITE ASSESSMENT |
| If 2014 total landings are available, ensure they were below 170,800t. |
| Based on HIGH compliance findings |
| Based on MEDIUM compliance findings |
| Based on LOW compliance findings |
| 5. ASSESSMENT DETERMINATION |
| The majority of management processes and frameworks have remained unchanged since the initial assessment. The most significant event was the publication of the 2015 SEDAR benchmark stock assessment, which reinforced or improved upon the conclusions of the initial assessment. The stock is no longer categorised as overfished, and continues to be categorised as not subject to overfishing. In response to this, the ASMFC have increased the TAC by 10%, and although the stock assessment does not make specific TAC recommendations, this does appear to be in line with its conclusions. The initial approval was made on the condition that the first surveillance should ensure that the fishery adheres to the (at the time) newly-introduced TAC. There is currently no additional landings data available to the assessment team, but this condition will remain in place and be checked again at the next surveillance. |
| HIGH Compliance |
| A1, A2, A3, B1, B2, C1, D2, D3, E1, E2 |
| MEDIUM Compliance |
| D1 |
| LOW Compliance |
| None |

| SUMMARY OF LEVEL OF COMPLIANCE | | | | | |
|---|---|---|------------------------|---------------------|----------------|
| | The Management Framework and Procedures | Stock assessment procedures and management advice | Precautionary approach | Management measures | Implementation |
| legal and administrative basis | A1 | | | | |
| Fisheries management should be concerned with the whole stock unit | A2 | | | | |
| Management actions should be scientifically based | A3 | | | | |
| Research in support of fisheries conservation and management should exist | | B1 | | | |
| Best scientific evidence available should be taken into account when designing conservation and management measures | | B2 | | | |
| The precautionary approach is applied in the formulation of management plans | | | C1 | | |
| The level of fishing permitted should be set according to management advice given by research organisations | | | | D1 | |
| Where excess fishing capacity exist, mechanisms should be in established to reduced capacity | | | | D2 | |
| Management measures should ensure that fishing gear and fishing practices do not have a significant impact on non-target species and the physical environment | | | | D3 | |
| A framework for sanctions of violation of laws and regulations should be efficiently exists | | | | | E1 |
| A management system for fisheries control and enforcement should be established | | | | | E2 |

KEY: Low Compliance: Medium Compliance: High Compliance:

| | | | |
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6. RATIONALE OF THE ASSESSMENT OUTCOME

A. THE MANAGEMENT FRAMEWORK AND PROCEDURE

LEVEL OF COMPLIANCE

A1. The management of the fishery must include a legal and administrative basis for the implementation of measures and controls to support the conservation of the fishery.

| | |
|---------------|--|
| LOW | An administrative framework that ensures an efficient management of the fishery for its conservation is not established. |
| MEDIUM | An administrative framework that ensures an efficient management of the fishery for its conservation is somehow established, but there is evidence of not being efficient to ensure the conservation of the stock. |
| HIGH | A legal and administrative framework that ensures an efficient management of the fishery for its conservation is established and works efficiently toward the conservation of the stock. |

Determination: There is no evidence of any substantial changes to the fishery management framework at the State level, or in the ASMFC, since the initial assessment. H

The Atlantic menhaden stock is distributed throughout coastal western Atlantic waters, from Nova Scotia to Florida. The reduction fishery is conducted primarily in the waters of Virginia, although the stock is also subject to removals by North Carolina and New Jersey. Management of the resource is coordinated by the Atlantic States Marine Fisheries Commission (ASMFC), which is funded by a combination of member state dues and federal grants. The ASMFC has no direct jurisdiction over state fisheries, and its recommendations must be approved by state governments prior to their implementation.

Management of marine fisheries in Virginia is the responsibility of the Virginia Marine Resources Commission (VMRC); in North Carolina the NC Division of Marine Fisheries (DMF); and in New Jersey the Bureau of Marine Fisheries (BMF). Each of the states supports stock-wide research efforts and has membership of the ASMFC.

For more information on state and inter-state management of the Atlantic menhaden stock, please refer to the initial assessment (R1).

R1

LEVEL OF COMPLIANCE

A2. Fisheries management should be concerned with the whole stock unit over its entire area of distribution and take into account fishery removals and the biology of the species.

| | |
|---------------|---|
| LOW | Fisheries management is not concerned with the whole stock unit over its entire area of distribution and do not take into account any of the matters listed in 'A1'. |
| MEDIUM | Fisheries management is concerned with matters listed in 'A1' but not entirely. Fisheries, in relation to 'A1' statement, should improve to ensure the long term conservation of the marine resource. |
| HIGH | Fisheries management should be concerned with the whole stock unit over its entire area of distribution and take into account: <ul style="list-style-type: none"> • All fishery removals • The biology of the species |

Determination: As at the time of the initial assessment, the management stock unit matches the biological stock, all fishery removals are taken into account, and the biology of the species is considered during the management process. H

The initial assessment determined that the best available science suggested that Atlantic menhaden represents a single biological stock throughout its range off the east coast of the US and Canada. The 2015 benchmark stock assessment, conducted by SEDAR since the initial assessment, maintains this conclusion, and also continues to reflect the fact that the management stock unit matches this distribution. The SEDAR report also confirms that all fishery removals continue to be taken into account, along with a detailed consideration of the biology of the species.

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| | | |
|---|--|----------|
| R1, R2 | | |
| LEVEL OF COMPLIANCE | | |
| <i>A3. Management actions should be based on long-term conservation objectives</i> | | |
| LOW | Management actions are not based on long term management objectives. | |
| MEDIUM | Management actions are based on long term management objectives. However the actions are not scientifically formulated. | |
| HIGH | Management actions are based on long term management objectives, and actions are science based. | |
| <i>Determination: Management of the resource continues to be based on the regularly-updated ASMFC FMP.</i> | | H |
| <p>Atlantic menhaden management is based on a regularly-updated Interstate Fishery Management Plan (IFMP) which is published by the ASMFC. At the time of the initial assessment, the most recent version of the plan was published in 2012; this is still the case. The objectives of the management plan are:</p> <p><i>“to manage the Atlantic menhaden fishery in a manner that is biologically, economically, socially and ecologically sound, while protecting the resource and those who benefit from it...To minimize the chance of a population decline due to overfishing, reduce the risk of recruitment failure, reduce impacts to species which are ecologically dependent on Atlantic menhaden, and minimize adverse effects on participants in the fishery”.</i></p> <p>Reference points for the fishery are defined in the IFMP and are set relative to Maximum Spawning Potential (MSP), where 100% MSP is the situation in the totally unfished stock. The 2012 IFMP sets the overfishing threshold at $F_{15\%MSP}$, with the target reference point $F_{30\%MSP}$. The IFMP also established an annual TAC of 170,800t; this has recently been increased to 187,880t as a result of the 2015 stock assessment – this is covered in more detail in section D1.</p> | | |
| R1, R4 | | |
| B. STOCK ASSESSMENT PROCEDURES AND MANAGEMENT ADVICE | | |
| LEVEL OF COMPLIANCE | | |
| <i>B1. Research in support of fisheries conservation and management should exist.</i> | | |
| LOW | Research to support the conservation and management of the stock, non-target species and physical environment does not exist | |
| MEDIUM | Research to support the conservation and the management of the stock, non-target species and physical environment exists, however research programmes could be significantly improved to decrease scientific advice uncertainty. | |
| HIGH | Research to support the conservation and the management of the stock, non-target species and physical environment exist, and existent research is considered most adequate for the long term conservation of the target, non-target and physical environment | |
| <i>Determination: Data collection and stock assessment activities continue to be carried out in support of the management of the stock. Since the initial assessment, a full benchmarking assessment has been conducted by SEDAR which provides further evidence to support a high compliance rating in this section.</i> | | H |
| <p>Management of the stock is informed by data collection at the state and inter-state levels, and by frequent stock assessments conducted by the ASMFC. At the time of the initial assessment the most recent stock assessment was conducted in 2011, but since that time a new benchmarking assessment has been conducted and published by Southeast Data, Assessment and Review (SEDAR). This new assessment states that, in relation to the current reference points, the stock is neither overfished nor subject to overfishing. The report also recommends updated reference points for the fishery based on the outcomes of the latest benchmarking. Despite these recommendations representing more conservative reference points, the current fishery remains neither overfished nor subject to overfishing when compared to them, as demonstrated by the table below.</p> | | |

The current stock status represents a substantial improvement on the results of the 2012 stock assessment. The estimated fishing effort is currently 0.27, where in 2012 it was estimated at 4.5.

| Current Reference Points | Benchmark | Current value |
|------------------------------|-----------|-------------------------|
| $F_{15\%}$ (threshold) | 3.41 | 0.27 (age-3; full F) |
| $F_{30\%}$ (target) | 1.07 | 0.27 (age-3; full F) |
| $FEC_{15\%}$ (threshold) | 45,889 | 156,495 |
| $FEC_{30\%}$ (target) | 92,444 | 156,495 |
| Recommended Reference Points | Benchmark | Current value |
| $F_{20\%}$ (threshold) | 2.01 | 0.24 (age-2) |
| $F_{36\%}$ (target) | 0.82 | 0.24 (age-2) |
| $FEC_{20\%}$ | 61,401 | 156,495 |
| $FEC_{36\%}$ | 111,077 | 156,495 |

Current (top) and newly-recommended (bottom) fishing mortality and fecundity target and limit reference points. F is fishing mortality; FEC is fecundity in billions of eggs. From the SEDAR report 2015 (R2).

R1, R2

LEVEL OF COMPLIANCE

B2. Best scientific evidence available should be taken into account when designing conservation and management measures.

| | |
|---------------|--|
| LOW | Scientific advice is not taken into account when designing conservation and management measures. |
| MEDIUM | Scientific advice is taken into account, when designing conservation and management measures. However some areas of discrepancy are identified that could have a significant impact in the long term conservation of the marine environment. |
| HIGH | Scientific advice is taken into account, when designing conservation and management measures, in a comprehensively manner. |

Determination: Management of the fishery continues to rapidly reflect the conclusions and recommendations of stock assessments.

ASMFC stock assessments form the basis for the development and amendment of management measures via the IFMP; as such, scientific evidence is the starting point for the management of the fishery and informs every stage of the process. The initial assessment provided a number of examples of recent, rapid responses by managers to scientific recommendations. In response to the 2015 stock assessment report, the Atlantic Menhaden Management Board of the ASMFC has already:

- Increased the TAC for 2015 and 2016 to 187,880t, and;
- Committed to the development of an amendment to establish ecologically-based reference points.

As at the time of the initial assessment, the assessment team was not able to find any significant examples of scientific recommendations being ignored.

R1, R2

C. THE PRECAUTIONARY APPROACH

LEVEL OF COMPLIANCE

C1. The precautionary approach is applied in the formulation of management plans.

| | |
|---------------|---|
| LOW | The precautionary approach is not applied in the formulation of management plans. |
| MEDIUM | The precautionary approach is applied, however not all uncertainties are taken into account. |
| HIGH | The precautionary approach is applied, taking into account uncertainties relating to the dynamic of fish population (recruitment, mortality, growth and fecundity), and the impact of the fishing activities, such as discards and by-catch |

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| | of non-target species as well as on the physical environment (Habitats). | H |
| <p>Determination: Stock assessments and management continue to factor in potential sources of error, and there is evidence throughout the management approach of an adherence to the precautionary approach.</p> <p>The regular Atlantic menhaden stock assessment includes consideration of potential sources of bias and uncertainty in all the data sources used to conduct the assessment, and in the results of the assessment itself. The 2015 SEDAR report includes consideration of uncertainties in all data sources, including those identified in the initial assessment. The results of the stock assessment are presented with 95% confidence intervals. A further example of the precautionary nature of management is the recommended increase in the stock reference points. At the time of the initial assessment, a similar action increasing how conservatively the reference points were set had recently been introduced. As shown in section B1, a similar recommendation has just been made in the SEDAR report, to correct for the fact that biomass was particularly low at the time the previous points were set.</p> <p>R1, R2</p> | | |

| D. MANAGEMENT MEASURES | | |
|--|--|---|
| LEVEL OF COMPLIANCE | | |
| <i>D1. The level of fishing permitted should be set according to management advice given by research organisations.</i> | | |
| LOW | The level of fishing permitted is not set according to management advice given by research organisations. | |
| MEDIUM | The level of fishing permitted is higher than management advice given by research organisations. However, the difference is not considered to have a significant impact of the sustainability of the stock | |
| HIGH | The level of fishing permitted is set according to management advice given by research organisations. | |
| <p>Determination: There is no additional evidence to indicate whether fishing effort has remained within the TAC or not. The TAC has been increased by 10% to reflect the results of the stock assessment, which does not make specific TAC recommendations. The assessment team considers a medium compliance rating to remain appropriate.</p> <p>Historically, the Atlantic menhaden fishery has not been subject to direct restrictions on the total level of fishing permitted. The 2012 FMP established a 170,800t TAC in response to findings that the stock was overfished, and at the time of the initial assessment the only available landings data since that time (landings for 2013) were 131,000t. For this reason, the fishery was awarded a medium compliance under this section, under the condition that future landings remained within the TAC. The 2015 SEDAR assessment does not include any updated landings data; total landings for 2014 were not available to the assessment team to determine whether the TAC was adhered to in that year.</p> <p>As a result of the low fishing mortality found by the 2015 stock assessment, the ASMFC increased the TAC for 2015 and 2016 by 10%, to 187,880. The stock assessment does not include a specific TAC recommendation, but this action is consistent with the precautionary approach when considering the stock status in relation to reference points.</p> <p>R1 – R3</p> | | M |
| LEVEL OF COMPLIANCE | | |
| <i>D2. Where excess fishing capacity exist, mechanisms should be in established to reduced capacity to allow for the recovery of the stock to sustainable levels.</i> | | |
| LOW | Mechanisms to allow for recovery of the stock to sustainable levels are not established. | |
| MEDIUM | Mechanisms to allow for recovery of the stock to sustainable levels are somehow established. However there is no evidence of the efficiency of the methods used. | |
| HIGH | Mechanisms are established to reduce capacity to allow for the recovery of the stock to sustainable levels and there are evidences of recovery. | |

There have been no significant changes to capacity management in the USA since the previous assessment. H

In August 2004 the NMFS published the United States National Plan of Action for the Management of Fishing Capacity. The main pledges by NMFS set out within were as follows:

- Establish and, when necessary and appropriate, revise the medium and long-term national capacity reduction targets
- Prepare regular assessments of overcapacity in federally managed fisheries
- Work with the regional fisheries Councils to reduce overcapacity in fisheries under their jurisdiction
- Convene a national meeting in 2005 that addresses, among other things, the capacity issue, where NOAA Fisheries and its constituents can review progress and focus on future priorities
- Help the Councils develop/ prioritize goals for capacity reduction in specific fisheries

Management measures which have an effect on fishing capacity which have been implemented in the USA include limited entry, exclusive quota programs, individual transferrable quotas, community development quotas and fishing cooperatives. A final effective approach which has been taken in some fisheries is the implementation of buyout schemes.

R1

LEVEL OF COMPLIANCE

D3. Management measures should ensure that fishing gear and fishing practices do not have a significant impact on non-target species and the physical environment.

| | |
|---------------|--|
| LOW | There are no management measures to prevent the impact of the fishing methods and fishing practices on non-target species and the physical environment. |
| MEDIUM | There are management measures to prevent the impact of the fishing methods and fishing practices on non-target species and the physical environment. However it is not science based. |
| HIGH | There are management measures to prevent the impact of the fishing methods and fishing practices on non-target species and the physical environment. Measures are based on scientific information. |

Determination: There is no evidence of substantial changes in the management of the fishery in relation to non-target species and the environment. The ASMFC has committed to the development of ecologically-based reference points, to better reflect menhaden’s role as a prey species. H

Numerous past studies have shown that there is little or no bycatch in the menhaden purse seine fishery. Some states restrict bycatch to 1% or less of the total catch on a vessel by regulation. The Virginia Institute of Marine Science studied bycatch levels of finfish, turtles, and marine mammals in the Atlantic menhaden fishery. Results from that study indicated that bycatch in the 1992 Atlantic menhaden reduction fishery was minimal, comprising about 0.04% by number.

The IFMP contains a substantial section detailing the relevant federal legal instruments in relation to ETP species, and their impacts and requirements in relation to the Atlantic menhaden fishery. The Endangered Species Act of 1973 (ESA) provides for the conservation of species that are endangered or threatened throughout all or a significant portion of their range, and the conservation of the ecosystems on which they depend.

Menhaden form a critical link between the lower and upper levels of the Chesapeake Bay food web, because they are a key forage species for fish such as striped bass, weakfish, and bluefish and are filter feeders, grazing on planktonic organisms such as algae and zooplankton. The stated goals of the Atlantic menhaden

IFMP include:

- Protect fishery habitats and water quality in the nursery grounds to insure recruitment levels are adequate to support and maintain a healthy menhaden population.
- Improve understanding of menhaden biology, food web ecology and multispecies interactions that may bear upon predator-prey and recruitment dynamics.
- Protect and maintain the important ecological role Atlantic menhaden play along the coast.
- Improve understanding of climatic drivers of recruitment.

In addition to these, in 2015 the ASMFC committed to the development of ecologically-based reference points, to reflect menhadens role as a forage and prey species. The first meeting of the Biological Ecological Reference Points Working Group was conducted in April 2015 to initiate this process.

Habitat effects are generally low for purse seines, although occasional contact is known to occur and, in these cases, can cause damage to fragile ecosystems (e.g. corals), particularly when targeting benthic-pelagic schooling species such as menhaden. The risk of ghost fishing by lost gear is also very low for purse seines.

The IFMP also requires that member states identify and protect areas of habitat crucial to menhaden, including prohibiting the use of gears or practices which cause habitat damage or inflict bycatch mortality on menhaden.

R1, R5

E. IMPLEMENTATION

| LEVEL OF COMPLIANCE | |
|--|--|
| <i>E1. There should be a framework for sanctions of violation of Laws and regulations.</i> | |
| LOW | A framework for sanctions of violation of Laws and regulations do not efficiently exist. |
| MEDIUM | A framework for sanctions of violation of Laws and regulations do exist but do not work efficiently. |
| HIGH | A framework for sanctions of violation of Laws and regulations exists and is proven to be efficient. |

Determination: The initial assessment identified functional and effective sanctions in place in Virginia and North Carolina, and some limited sanctions in New Jersey. There have been no substantial changes since that time.

Sanctions for violations of fishery laws and regulations are in place in each of the three states in which the reduction fishery is conducted. Sanctions described in the Code of Virginia (Title 28.2, Fisheries and Habitat of the Tidal Waters) include fines, confiscation of gear, cancellation of fishing permits, and imprisonment. North Carolina General Statutes § 113-187 (Penalties for violations of subchapter and rules) states that violations of the marine fisheries subchapter, or any rules created through it, can be punished by fines, house arrest, community service, incarceration, or confiscation of gear or fish, depending on the specific nature of the violation and any prior convictions. Sanctions described in the New Jersey Statutes (Title 23, Fish and Game, Wild Birds and Animals) appear to be limited to fines.

For more detail on the sanctions in place in each state, please refer to the initial assessment (R1)

R1

| LEVEL OF COMPLIANCE | |
|---|---|
| <i>E2. A management system for fisheries control and enforcement should be established.</i> | |
| LOW | A management system for fisheries control and enforcement is not established. |
| MEDIUM | A management system for fisheries control and enforcement is established but do not work efficiently. |

| | | |
|---|--|---|
| HIGH | A management system for fisheries control and enforcement is established and work efficiently. | H |
| <p>Determination: As at the time of the initial assessment, all three states engaging in the menhaden reduction fishery have effective law enforcement organisations in place, which are also monitored by the Law Enforcement Committee of the ASMFC.</p> <p>Each of the states in which the menhaden reduction fishery is conducted has established effective fishery control and enforcement systems. The Virginia Marine Police (VMP) comprise the largest division within the Virginia Marine Resources Commission, and are responsible for enforcing state and federal commercial and recreational fishery laws and regulations. The enforcement of marine fishery laws and rules in NC falls under the jurisdiction of the North Carolina Marine Patrol (NCMP). The Bureau of Law Enforcement, within the DEP’s Division of Fish and Wildlife, constitutes New Jersey’s wildlife law enforcement agency. The activities of all three are monitored and reported upon by the Law Enforcement Committee (LEC) of the ASMFC.</p> <p>For more information on the control and enforcement systems in place in the fishery, please refer to the initial assessment (R1)</p> <p>R1</p> | | |

| |
|---------------------|
| 7. KEY STAKEHOLDERS |
| |

8. REFERENCES

- R1 – USA Atlantic Menhaden initial assessment, May 2014: <http://www.iffo.net/files/iffoweb/approved-raw-materials/whole-fish/usa-atlantic-menhaden-initial-assessment-may-20141.pdf>
- R2 – SEDAR 40 Atlantic menhaden stock assessment report, January 2015: http://www.asmfc.org/uploads/file/55089931S40_AtlMenhadenSAR_CombinedFINAL_1.15.2015-reduced.pdf
- R3 – Atlantic menhaden 2015 TAC press release: http://www.asmfc.org/uploads/file/554a42c4pr15AtlMenhadenTAC_AmendmentInitiation.pdf
- R4 – ASMFC species page, Atlantic Menhaden: <http://www.asmfc.org/species/atlantic-menhaden>
- R5 – Minutes of the first meeting of the BERP WG: http://www.asmfc.org/uploads/file/5579f41fBERP_WorkingGroup_April2015.pdf