IFFO RS

IFFO RS
Global Standard for Responsible Supply
of Marine Ingredients

RESPONSIBLE
SUPPLY

IFFO
RS

ASSURED

Global Standard for Responsible Supply of Marine Ingredients
Fishery Assessment Methodology and Template Report V2.0

Fishery Under Assessment	Gulf Menhaden *Brevoortia patronus* Gulf States USA
Date	**August 2019**
Assessor	**Jim Daly**

Application details and summary of the assessment outcome			
Name: Daybrook Fisheries, Inc; Omega Protein Inc.			
Address: Louisiana (Abbeville, Moss Point)			
Country: USA		Zip:	
Tel. No.:		Fax. No.:	
Email address:		Applicant Code	
Key Contact:		Title:	
Certification Body Details:			
Name of Certification Body:		SAI Global Ltd	

Assessor Name	Pier Reviewer	Assessment Days	Initial/Surveillance/Re-approval	Whole fish/ By-product
Jim Daly	Sam Dignan	4	Re-approval	Whole fish

Assessment Period	2019

Scope Details	
Management Authority (Country/State)	Gulf States Marine Fisheries Commission (GSMFC); USA Gulf States
Main Species	Gulf Menhaden *Brevoortia patronus*
Fishery Location	USA Gulf of Mexico (GOM) state and federal waters
Gear Type(s)	Purse seine
Outcome of Assessment	
Overall Outcome	PASS
Clauses Failed	NONE
Peer Review Evaluation	PASS
Recommendation	APPROVE

Assessment Determination

The Gulf of Mexico (GOM) menhaden purse seine fishery is highly targeted, exploiting highly homogeneous shoals of gulf menhaden *Brevoortia patronus*. Yields comprise high proportions (up to 99%) of the target species. Gulf menhaden is distributed in both state waters (within 3 nautical miles (nm) or 9nm of shore depending on the state) and federal waters (outside 3nm or 9nm to 200nm).

Yellowfin menhaden (*Brevoortia smithi*), Finescale menhaden (*Brevoortia gunteri*) and Atlantic thread herring (*Opisthonema oglinum*) may also be incidentally harvested. Catches of these species, representing less than 1% of total catches, occur primarily at the eastern and western edges of the area of fleet activity.

The five GOM states which engage, to varying extents, in the menhaden fishery are Florida, Alabama, Mississippi, Louisiana, and Texas. As most of the fishing occurs in state waters management of the fishery is their responsibility. Each state has an administrative body tasked with management of both commercial and recreational fisheries. Eenforcement of regulations which promote sustainable fishing practices are also the responsibility of individual states, in their waters.

The Gulf States Marine Fisheries Commission (GSMFC) coordinates inter-state management. The GOM Fishery Management Council is responsible for conservation of stocks within the GOM EEZ extending from 3 (or in some states 9) to 200nm off each state's coast. The Fishery Management Plan (FMP) for gulf menhaden treats the stock as a single unit across the entire Gulf region, an approach which filters down to state level via GSMFC.

The 2018 stock assessment was undertaken through the South-east Data, Assessment, and Review (SEDAR) process and also through GSMFC which coordinated the data and assessment workshops while SEDAR coordinated the review workshop. Fishery-dependent data sources are available from 1977-2017. The five gulf states also collect a significant amount of fishery-independent data on finfish from inshore surveys; total menhaden numbers and lengths are recorded.

According to the latest assessment, the GOM menhaden population is not overfished and overfishing is not occurring. There is very little risk of overfishing occurring or of the stock being overfished.

Future assessments should look for evidence of implementation of measures that improve data and reporting of any incidental cetacean catches in the fishery. For example, there is some uncertainty and lack of data around the impact of the fishery on bottlenose dolphins.

During a recent assessment by SAI Global's Certification Committee (June 2019) when asked by the assessors all states indicated that there was no evidence of systematic non-compliance by the fleet. Future IFFO-RS fisheries assessments should examine implementation of a recommendation by SAI Global's assessment team that Clients and the Commission's Law Enforcement Community collaborate in designing and implementing reporting formats that capture each agency's annual enforcement inputs and outcomes while also respecting confidentiality provisions.

A determination reached by SAI Global's Certification Committee (June 2019) was that the fishery should be certified according to MSC Principles and Criteria.

Gulf menhaden (*Brevoortia patronus*) is assessed as a species of least concern (IUCN.org) and is not on the current list of CITES endangered species appendices (websites accessed 10.08.19).

Gulf menhaden (*Brevoortia patronus*) is approved by the assessment team for the production of fishmeal and fish oil under the IFFO-RS v 2.0 whole fish standard.

Peer Review Comments

Notes for On-site Auditor

Note: This table should be completed for whole fish assessments only.

General Results

General Clause	Outcome (Pass/Fail)
M1 - Management Framework	PASS
M2 - Surveillance, Control and Enforcement	PASS
F1 - Impacts on ETP Species	PASS
F2 - Impacts on Habitats	PASS
F3 - Ecosystem Impacts	PASS

Species-Specific Results

Category	Species	% landings	Outcome (Pass/Fail)	
Category A	Gulf Menhaden *Brevoortia patronus*	99	A1	PASS
			A2	PASS
			A3	PASS
			A4	PASS
Category B				
Category C				
Category D	Yellowfin menhaden (*Brevoortia smithi*),	<1	PASS	
Category D	Finescale menhaden (*Brevoortia gunteri*)	<1	PASS	
Category D	Atlantic thread herring (*Opisthonema oglinum*)	<1	PASS	

[List all Category A and B species. List approximate total %age of landings which are Category C and D species; these do not need to be individually named here]

HOW TO COMPLETE THIS ASSESSMENT REPORT

This assessment template uses a modular approach to assessing fisheries against the IFFO RS standard.

Whole Fish

The process for completing the template for a **whole fish** assessment is as follows:

1. ALL ASSESSMENTS: Complete the Species Characterisation table, to determine which categories of species are present in the fishery.
2. ALL ASSESSMENTS: Complete clauses M1, M2, M3: Management.
3. IF THERE ARE CATEGORY A SPECIES IN THE FISHERY: Complete clauses A1, A2, A3, A4 for **each** Category A species.
4. IF THERE ARE CATEGORY B SPECIES IN THE FISHERY: Complete the Section B risk assessment for **each** Category B species.
5. IF THERE ARE CATEGORY C SPECIES IN THE FISHERY: Complete clause C1 for **each** Category C species.
6. IF THERE ARE CATEGORY D SPECIES IN THE FISHERY: Complete Section D.
7. ALL ASSESSMENTS: Complete clauses F1, F2, F3: Further Impacts.

A fishery must score a pass in **all applicable clauses** before approval may be recommended. To achieve a pass in a clause, the fishery/species must meet **all** of the minimum requirements.

By-products

The process for completing the template for **by-product raw material** is as follows:

1. ALL ASSESSMENTS: Complete the Species Characterisation table with the names of the by-product species and stocks under assessment. The '% landings' column can be left empty; all by-products are considered as Category C and D.
2. IF THERE ARE CATEGORY C BYPRODUCTS UNDER ASSESSMENT: Complete clause C1 for **each** Category C by-product.
3. IF THERE ARE CATEGORY D BYPRODUCTS UNDER ASSESSMENT: Complete Section D.
4. ALL OTHER SECTIONS CAN BE DELETED. Clauses M1 - M3, F1 - F3, and Sections A and B do not need to be completed for a by-product assessment.

By-product approval is awarded on a species-by-species basis. Each by-product species scoring a pass under the appropriate section may be approved against the IFFO RS Standard.

SPECIES CATEGORISATION

The following table should be completed as fully as the available information permits. Any species representing more than 0.1% of the annual catch should be listed, along with an estimate of the proportion of the catch each species represents. The species should then be divided into Type 1 and Type 2 as follows:

- **Type 1 Species** can be considered the 'target' or 'main' species in the fishery. They make up the bulk of annual landings and are subjected to a detailed assessment.
- **Type 2 Species** can be considered the 'bycatch' or 'minor' species in the fishery. They make up a small proportion of the annual landings and are subjected to relatively high-level assessment.

Type 1 Species must represent 95% of the total annual catch. Type 2 Species may represent a maximum of 5% of the annual catch (see Appendix B).

Species which make up less than 0.1% of landings do not need to be listed (NOTE: ETP species are considered separately). The table should be extended if more space is needed. Discarded species should be included when known.

The 'stock' column should be used to differentiate when there are multiple biological or management stocks of one species captured by the fishery. The 'management' column should be used to indicate whether there is an adequate management regime specifically aimed at the individual species/stock. In some cases, it will be immediately clear whether there is a species-specific management regime in place (for example, if there is an annual TAC). In less clear circumstances, the rule of thumb should be that if the species meets the minimum requirements of clauses A1-A4, an adequate species-specific management regime is in place.

NOTE: If any species is categorised as Endangered or Critically Endangered on the IUCN Red List, or if it appears in the CITES appendices, it **cannot** be approved for use as an IFFO RS raw material. This applied to whole fish as well as by-products.

TYPE 1 SPECIES (Representing 95% of the catch or more)
Category A: Species-specific management regime in place.
Category B: No species-specific management regime in place.

TYPE 2 SPECIES (Representing 5% OF THE CATCH OR LESS)
Category C: Species-specific management regime in place.
Category D: No species-specific management regime in place.

Common name	Latin name	Stock	% of landings	Management	Category
Gulf Menhaden	*Brevoortia patronus*	Gulf of Mexico	99	Gulf states	A
Yellowfin menhaden	*Brevoortia smithii*	Gulf of Mexico	<1	Gulf states	D
Finescale menhaden	*Brevoortia gunteri*	Gulf of Mexico	<1	Gulf states	D
Atlantic thread herring	*Opisthonema oglinum*	Gulf of Mexico	<1	Gulf states	D

MANAGEMENT

The two clauses in this section relate to the general management regime applied to the fishery under assessment. A fishery must meet all the minimum requirements in every clause before it can be recommended for approval.

M1	Management Framework – Minimum Requirements		
	M1.1	There is an organisation responsible for managing the fishery	PASS
	M1.2	There is an organisation responsible for collecting data and assessing the fishery	PASS
	M1.3	Fishery management organisations are publicly committed to sustainability	PASS
	M1.4	Fishery management organisations are legally empowered to take management actions	PASS
	M1.5	There is a consultation process through which fishery stakeholders are engaged in decision-making	PASS
	M1.6	The decision-making process is transparent, with processes and results publicly available	PASS
		Clause outcome:	**PASS**

Evidence
M1.1:
Gulf menhaden is distributed in both state waters (within 3nm or 9nm of shore) and federal waters (outside 3nm or 9nm to 200nm). As most of the fishing occurs in state waters management is the responsibility of state authorities. The five states which engage, to varying extents, in the gulf menhaden fishery are Florida, Alabama, Mississippi, Louisiana, and Texas (**Figure 1**):
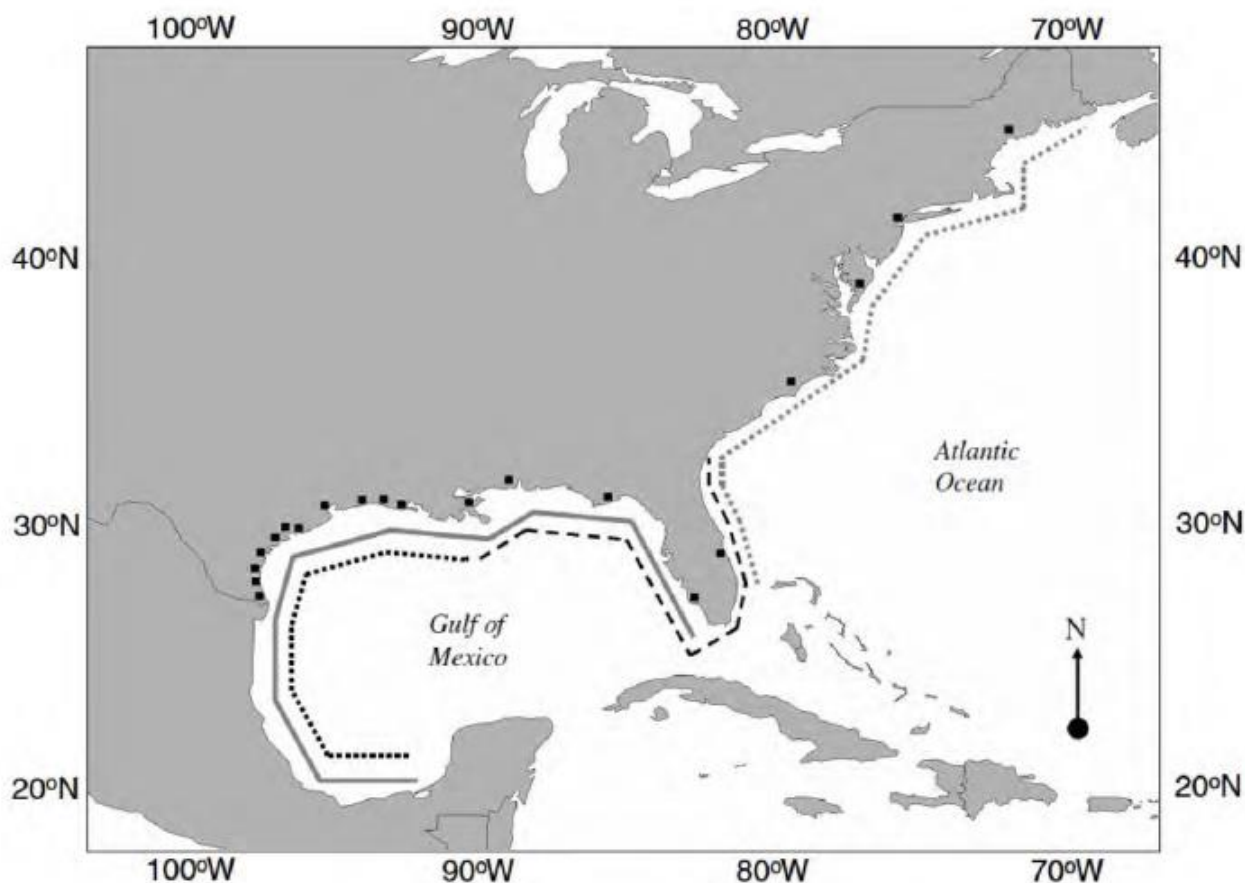
Figure 1: Geographic range of the four menhaden species: Gulf Menhaden (*Brevoortia patronus*) -smooth gray line, Gulf; Atlantic Menhaden (*B. tyrannus*) - dotted gray line, Atlantic; Finescale Menhaden (*B. gunteri*) - dotted black line, western Gulf; and Yellowfin Menhaden (*B. smithi*) - dashed black line, eastern Gulf. R10

Each state has an administrative body tasked with management of both commercial and recreational fisheries. The Gulf States Marine Fisheries Commission (GSMFC) coordinates inter-state fisheries management and is composed of three members from each of gulf states, the head of the Marine Resource Agency, a member of each state legislature, and a citizen of each state with thorough knowledge of marine fisheries.

The GSMFC was established by an act of Congress in 1949. Its mandate is:

"to promote better utilization of the fisheries, marine, shell and anadromous, of the seaboard of the Gulf of Mexico, by the development of a joint program for the promotion and protection of such fisheries and the prevention of the physical waste of fisheries from any cause.''

The GSMFC makes recommendations to state governments based on results of scientific studies carried out by state, federal and academic agencies. It is also responsible, within the Gulf region, for the Interjurisdictional Fisheries (IJF) Program designed to develop management plans for transboundary stocks such as gulf menhaden. The Menhaden Advisory Committee (MAC) is a component of the GSMFC and served as the Technical Committee throughout the most recent stock assessment process (2018).

Primary management authorities at each state level are the Florida Fish and Wildlife Conservation (FWC) Commission; the Department of Conservation and Natural Resources (DCNR) Alabama; the Department of Marine Resources (DMR) Mississippi; the Department of Wildlife and Fisheries (DWF) Louisiana and the Texas Parks and Wildlife Department (TPWD). Each authority is legally empowered to introduce and enforce fisheries management regulations, through either state administrative code, statutes, or specific legal instruments.
Federal agencies include the National Marine Fisheries Service (NMFS) or National Oceanic and Atmospheric Administration (NOAA)); the National Park Service (NPS), the U.S. Army Corps of Engineers (USACOE),

the U.S. Fish and Wildlife Service (USFWS) and the Environmental Protection Agency (EPA). All are also involved directly or indirectly with the management of gulf menhaden.

Within NMFS a total of 474 fish stocks or stock complexes are managed in a total of 46 Fisheries Management Plans (FMP's). The FMP for gulf menhaden treats the stock as a single unit across the entire Gulf region, an approach which filters down to state level via the GSMFC.

The Gulf of Mexico Fishery Management Council is responsible for the conservation and management of fish stocks within the Gulf of Mexico Exclusive Economic Zone (EEZ); extending from 3 to 200 nautical miles off the coasts of Louisiana, Mississippi, and Alabama, and 9 to 200 nautical miles off Texas and the west coast of Florida.

There are organisations responsible for managing the fishery.
R1-R11

M1.2
The stock assessment for Gulf Menhaden was benchmarked in 2013, updated in 2016, and underwent a benchmark again in late 2018. The Southeast Data, Assessment, and Review (SEDAR) is a cooperative fishery management council process initiated in 2002 to improve quality and reliability of fishery stock assessments in the South Atlantic, Gulf of Mexico, and U.S. Caribbean.

The 2018 assessment of the Gulf menhaden fishery was undertaken through SEDAR and also through GSMFC who coordinated the Data and Assessment Workshops. SEDAR coordinated the Review Workshop.

There is an organisation responsible for collecting data and assessing the fishery
R3, R10-R11

M1.3:
The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act MSA) is the primary law governing marine fisheries management in US federal waters. First passed in 1976, the Magnuson-Stevens Act fosters long-term biological and economic sustainability of the country's marine fisheries out to 200 nm from shore.

Key objectives of the Magnuson-Stevens Act are to:
- Prevent overfishing and where necessary rebuild overfished stocks.
- Increase long-term economic and social benefits of marine fisheries.
- Ensure a safe and sustainable supply of seafood.

NMFS are responsible for the stewardship of the US's ocean resources and habitat and are charged with providing the following services to all stakeholders:
- Productive and sustainable fisheries
- Safe sources of seafood
- Recovery and conservation of protected resources
- Healthy ecosystems.
- An ecosystem-based approach to management.

Using the Magnuson-Stevens Act as the guide, NMFS work in partnership with Regional Fishery Management Councils (RFMC's e.g. the Gulf of Mexico Fishery Management Council) to assess and predict the status of fish stocks, set catch limits, ensure compliance with fisheries regulations, and reduce bycatch.

Mission statements and objectives of each state body charged with managing the fishery all contain references to sustainable resource management.

Fishery management organisations are publicly committed to sustainability
R3, R9, R11-R12; R21-R23

M 1.4:

The Interjurisdictional Fisheries (IJF) Program is designed to develop management plans for transboundary stocks such as gulf menhaden. Implementation of the Program is under the auspices of the GSMFC.

The Interjurisdictional Fisheries Act of 1986 (Title III, Public Law 99-659) was established by Congress to:
- Promote gulf state activities in support of management of interjurisdictional fishery resources.
- Encourage management of interjurisdictional fishery resources throughout their range.

Congress authorized federal funding to support state research and management projects consistent with these purposes. Additional funds were also authorized to support development and revision of interstate Fishery Management Plans (FMPs) by GSMFC and other marine fishery commissions.

After passage of the act GSMFC initiated the development of an FMP planning and approval process. The GSMFC decided to pattern its plans after those of the GMFMC (Gulf of Mexico Fisheries Management Council) under the Magnuson Fishery Conservation and Management Act of 1976 (MSA). This statute is the primary law governing marine fisheries management in US federal waters. First passed in 1976, the MSA fosters long-term biological and economic sustainability of the country's marine fisheries out to 200 nautical miles from shore.

Key objectives of the MSA are to:
- Prevent overfishing
- Rebuild overfished stocks
- Increase long-term economic and social benefits
- Ensure a safe and sustainable supply of seafood.

Each state authority is empowered to introduce and enforce fisheries regulations, through either State administrative codes, statutes, or specific legal instruments.

Fishery management organisations are legally empowered to take management actions.
R1, R3, R21-R23

M1.5:
Gulf States Marine Fisheries Commission (GSMFC):
The Commission and its subordinate structures have well-established, inclusive and transparent consultation and engagement processes in which to seek input and comments from affected and impacted stakeholder groups and the general public on important policy and management changes.

GSMFC established requirements that each Fishery Management Plan (FMP) be developed by a Technical Task Force (TTF) comprised of State fisheries experts. Members were to be appointed by each State's representative on the S-FFMC (State-Federal Fisheries Management Committee) (**Figure 2**):

Each of the Subcommittees or Committees of the GSMFC (Commercial/Recreational Fisheries Advisory Panel, Law Enforcement Committee, and TCC Habitat Subcommittee) also appointed one member or delegate to the TTF (**Figure 2**):

DMS = Data Management Subcommittee
SAT = Stock Assessment Team
HSC = Habitat Subcommittee
LEC = Law Enforcement Committee
CRFAP = Comm/Rec Fishery Advisory Committee
TTF = Technical Task Force

TCC = Technical Coordinating Committee
S-FFMC = State-Federal Fisheries Management Committee
GSMFC = Gulf States Marine Fisheries Commission
*Outside Review = standing committees, trade associations, general public
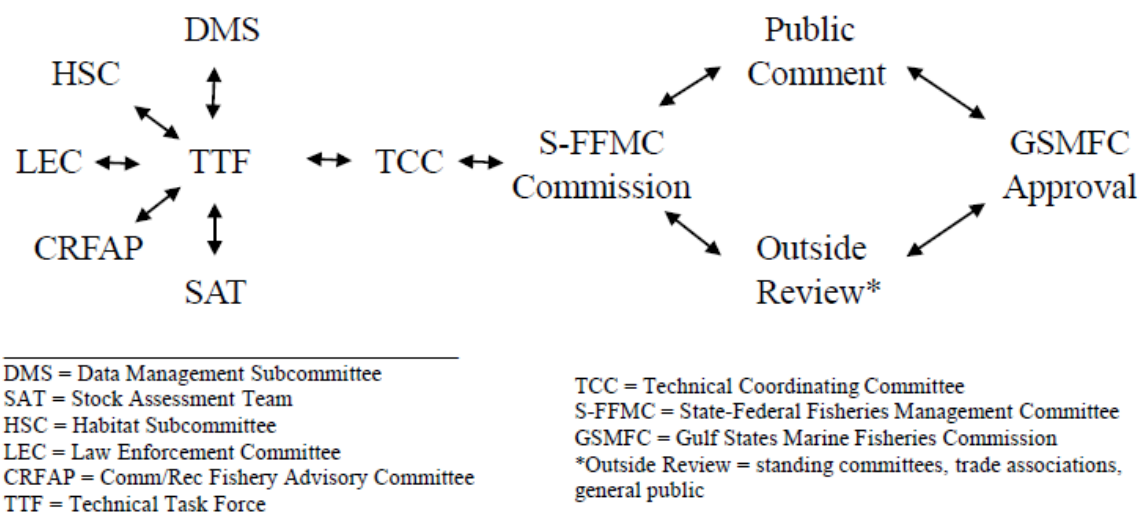
Figure 2 Development and approval process for the Gulf menhaden FMP (2012) R1

Outside review of the FMP includes standing committees, trade associations and the general public. At state level management advisory services, including public consultation and engagement, are assigned to each states' advisory committees e.g. Florida's Fish and Wildlife Conservation Commission (**M 1.6**).

There is a consultation process through which fishery stakeholders are engaged in decision-making.
R1, R3, R16

M1.6:
The Gulf of Mexico FMC is responsible for the conservation and management of fish stocks within the Gulf of Mexico Exclusive Economic Zone (EEZ). Plans and specific management measures (such as fishing seasons, quotas, and closed areas) are developed based on sound scientific advice, and are initiated, evaluated, and ultimately adopted in a fully transparent and public process. These plans and measures are then implemented by the National Marine Fisheries Service (NMFS).

Florida's Fish and Wildlife Conservation Commission (Commission) is committed to providing ample opportunity for public input at each meeting. As standard practice, the Commission welcomes public input regarding agenda items using the approved speaker registration process and time limits. Meeting minutes are regularly posted online.

In Alabama the Conservation Advisory Board, created by statute, is composed of 10 members appointed by the Governor and three ex-officio members in the persons of the Governor, the Commissioner of Agriculture and Industries, and the Director of the Alabama Cooperative Extension System. The Advisory Board assists in formulating policies for the Department of Conservation, examines all rules and regulations and makes recommendations for their change or amendment. Meetings usually take place in February, March or May. Meeting minutes are posted online.

Consultations and advisory council minutes are available online on the Department of Marine Resources (DMR Mississippi) website on the public notices link.

Within Louisiana's Department of Wildlife and Fisheries, Commission meetings provide and encourage opportunities for public input. The Department encourages public participation throughout the management process to not only ensure stakeholders' interests are considered but also to ensure they understand the regulatory process and resulting management actions. Commission minutes are available online.

Texas Parks and Wildlife Commission Meetings are open to the public. Anyone who is interested in speaking to the Commission is encouraged to attend. Agendas and transcripts are grouped by fiscal year. Meetings are held at TPWD Headquarters in Austin, Texas. The Commission adopts policies and rules to carry out all programs of the Texas Parks and Wildlife Department. Each August the Commission conducts an annual public

hearing to receive input from partners, stakeholders and constituents concerning any issues relating to Department policies, goals, programs, and responsibilities.   Minutes of meetings are available online.

The decision-making process is transparent, with processes and results publically available

R11; R16-R20

References p 32

Standard clauses 1.3.1.1, 1.3.1.2

M2	Surveillance, Control and Enforcement - Minimum Requirements		
	M2.1	There is an organisation responsible for monitoring compliance with fishery laws and regulations	PASS
	M2.2	There is a framework of sanctions which are applied when laws and regulations are discovered to have been broken	PASS
	M2.3	There is no substantial evidence of widespread non-compliance in the fishery, and no substantial evidence of IUU fishing	PASS
	M2.4	Compliance with laws and regulations is actively monitored, through a regime which may include at-sea and portside inspections, observer programmes, and VMS.	PASS
		Clause outcome:	PASS

Evidence
M2.1:
NOAA's Office of Law Enforcement (OLE) investigates violations of marine resource protection laws. The Office of the General Counsel's Enforcement Section is NOAA's civil prosecutor. Together, the two offices make up NOAA's enforcement program.

OLE directly supports core mission mandates of NOAA Fisheries:
- Maximizing productivity of sustainable fisheries and fishing communities
- Protection, recovery, and conservation of protected species

OLE jurisdiction generally covers ocean waters between 3 and 200 miles offshore and adjacent to all US states and territories. The Southeast Division covers Federal waters off Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina and North Carolina.

The United States Coast Guard, in Federal waters, is responsible for enforcing fishery management regulations adopted pursuant to management plans developed by GMFMC.

The Fish and Wildlife Act (1956) aids States in the form of law enforcement training and cooperative law enforcement agreements.

Enforcement of fishing regulations is also the responsibility of individual States:
- Louisiana – Enforcement Division of the Louisiana Department of Wildlife and Fisheries.
- Mississippi – Marine Patrol of the Mississippi Department of Marine Resources.
- Texas – Marine Enforcement Section of the Texas Parks and Wildlife Department.
- Florida – Division of Law Enforcement of the Florida Fish and Wildlife Conservation Commission.
- Alabama – Marine Police Division of the Alabama Marine Resources Division.

Louisiana
The Mission of the Enforcement Division is to establish and maintain compliance through the execution and enforcement of laws, rules and regulations of the State relative to the management, conservation and protection of renewable natural wildlife and fisheries resources.

Mississippi
Fisheries enforcement in Mississippi is the responsibility of the Marine Patrol of the Mississippi Department of Marine Resources. The Marine Patrol provides enforcement of Federal and State (within 3nm) laws and the ordinances of the Commission on Marine Resources for the protection, propagation, preservation and conservation of Mississippi's seafood, aquatic life and associated coastal wetland habitats.

Texas
Texan game wardens have authority granted under the Texas Water Safety Act to provide law enforcement, boating safety and education, and resource protection for all the public waters of the State and the Gulf of Mexico out to nine nm. All game wardens are certified Marine Safety Enforcement Officers. The enforcement of regulations regarding the commercial fishing and shrimping industries, oyster reef and harvest management, invasive species, protection of environmentally sensitive areas, recreational sport hunting and fishing activities, and the protection of water quality are all the responsibility of the Marine Enforcement Section. Texas Parks and Wildlife Department (TPWD) assist in the enforcement of Federal regulations, working hand in hand with the National Marine Fisheries, U.S. Coast Guard, and other Federal resource protection agencies.

Florida

The Division's four core missions are resource protection, environmental protection, boating and waterways, and public safety. The Division of Law Enforcement represents a large part of the Fish and Wildlife Conservation (FWC) personnel, with over 1,000 employees, over 800 of whom are sworn officers. In 2012 the FWC Division of Law Enforcement was combined with the Department of Environmental Protection's Division of Law Enforcement and parts of the Department of Agriculture and Consumer Services' Office of Agricultural Law Enforcement to include officers assigned to patrol state forests and investigators responsible for commercial aquaculture violations.

Alabama

The Department of Conservation and Natural Resources is an executive and administrative department of the State of Alabama created by Statute. The Commissioner advises the Governor and Legislature on management of freshwater fish, wildlife, marine resources, state lands, state parks, and other natural resources. The Department has four divisions including Marine Resources. Ffisheries enforcement in Alabama is the responsibility of the Marine Police Division of the Alabama Marine Resources Division.

There is an organisation (s) responsible for monitoring compliance with fishery laws and regulations.
R4-R8; R22

M2.2
Louisiana

Sanctions for violations of laws and regulations are set out in Title 56 of the Louisiana Revised Statutes. Violations are classified from Class 1 to Class 8, with Class 8 being the most serious.

Punishments include:
- Class 1 - First offense a fine of US$50 or imprisonment for not more than fifteen days, or both. Second offense, a fine of not less than US$75 not more than US$250 or imprisonment for not less than thirty days not more than sixty days, or both. Third and subsequent offenses a fine of not less than US$200 not more than US$550 dollars and imprisonment for not less than thirty days not more than ninety days
- Class 8 - For each offense, the fine shall not be less than US$5,000 not more than US$7,000 and the violator may be imprisoned in jail for not less than sixty days not more than six months.

More general powers of the legislature include the seizure of assets related to the transgression, and revocation of fishing licenses.

Mississippi

Violation of any provision of the saltwater fishing regulations is classified as a misdemeanor, and upon conviction is punishable by a fine of up to US$500. Each day of a continuing violation constitutes a separate violation. Violations of more than 1 section or subsection of the regulations or parts thereof are considered separate offenses and punished as such. Any person or vessel convicted of a 2nd or subsequent violation of any provisions of these regulations is considered guilty of a misdemeanor and upon conviction can be punished by a fine of up to US$10,000.

Texas

When a Texas Game Warden encounters a violation of hunting and fishing regulations, there will be a criminal complaint filed in either a justice court or a county court. Fines for such violations are assessed by the presiding judge hearing the case. In addition to assessed fines that may be associated with a criminal complaint, violators are also liable to civil restitution for the loss of or damage to wildlife resources that have resulted from the violation. Failure to pay the civil recovery value will result in the Department's refusal to issue any license, tag or permit in the violator's name until restitution is made. An individual who hunts or fishes after such a refusal commits a Class A misdemeanor which is punishable by a fine not less than US$500 not more than US$4,000; punishment in jail not to exceed one year; or both fine and confinement.

Florida

Penalties for violations of Florida marine laws and regulations are established in Florida Statutes, Chapter 379. Upon arrest and conviction for violation of specified laws or regulations, a license-holder is required to show

just cause as to why his or her saltwater products license or, in some cases, the specific endorsement, should not be suspended or revoked. Major violations trigger a suspension or monetary penalty and the license holder has administrative recourse.

The Fish and Wildlife Commission (FWC) are responsible for setting fees, licensing, and penalties as laid down in the 2012 Florida Statutes, Title XXVIII.

Chapter 379, Section 407 of the 2012 Florida Statutes state that unless otherwise provided by law, any person, firm, or corporation who violates any provision of this chapter, or any rule of the Fish and Wildlife Commission (FWC) relating to the conservation of marine resources, shall be punished upon a first conviction, by imprisonment for a period of not more than 60 days or by a fine of not less than $100 nor more than $500, or by both such fine and imprisonment.

Alabama
Title 9, Section 11 of the 2009 Alabama Code Section 9-11-156 describes "Penalties for violations of provisions of article":

"Any person, firm, co-partnership, association or corporation violating any of the provisions of this article or rules and regulations based thereon shall be guilty of a Class A misdemeanor and, upon conviction for the first offense, shall be punished by a fine of not more than $2,000.00 and/or sentenced to imprisonment for not more than one year; upon conviction for the second or any subsequent offense, the punishment shall be by a fine of not less than $500.00 nor more than $2,000.00, and/or by imprisonment for not less than one month nor more than one year.

A framework of sanctions is applied when laws and regulations are discovered to have been broken.

R1, R4-R8; R22

M2.3:
States do not report on enforcement activities specifically as regards operations of the purse seine fleet. This extends to surveillance activities targeting marine protected areas and other spatial management requirements.

During a recent assessment by SAI Global's Certification Committee (June 2019) when asked by the assessors all states indicated that there was no evidence of systematic non-compliance by the purse seine fleet. The assessment team noted that Omega Inc (a major stakeholder in the fishery) has a self-monitoring code for crew members that requires compliance with all laws and rules.

While the perceptions of some stakeholders and individuals are that fleet operations are not adequately monitored at sea or in port the SAI Global assessment team concluded that the likelihood of frequent or repetitive fishing infractions by the purse seine fleet is very low.

Further IFFO-RS fisheries assessments should examine the implementation of a recommendation by SAI Global's assessment team that Clients and the Commission's Law Enforcement Community collaborate in designing and implementing a reporting format that captures each agency's annual enforcement inputs and outcomes while respecting confidentiality provisions.

There is no substantial evidence of widespread non-compliance in the fishery, and no substantial evidence of IUU fishing.
R12

M 2.4
All vessels in the fleet for the commercial reduction fishery are required to operate Vessel Monitoring Systems (VMS) when on fishing trips. These units transmit positional information to a communication service provider who, in turn, makes information available to the competent authorities for fisheries control. VMS allows authorities to pinpoint where a vessel has been operating in order to ensure they have not encroached on any protected areas of seabed.

In Louisiana the Enforcement Division of the Louisiana Department of Wildlife and Fisheries (LDWF) is responsible for managing fisheries out to 9 nautical miles. LDWF in conjunction with NOAA Fisheries and U.S. Coast Guard enforcement agents ensure fishermen are complying with rules and regulations in place. Enforcement techniques such as patrols and investigations catch violators as well as outreach and education to prevent illegal activities. The most common fishing violations include fishing out of season, fishing in restricted areas and exceeding catch limits.

In Mississippi the Office of Marine Fisheries provides for the effective management of the state's marine fisheries, including menhaden and other commercially and recreationally important species. The Office utilizes the most appropriate methods for management, including seafood safety inspections of processing and distribution facilities.

In Texas game wardens have authority granted under the Texas Water Safety Act to provide law enforcement, boating safety and education, and resource protection for all State and Gulf of Mexico waters out to nine nm. All game wardens are certified Marine Safety Enforcement Officers. Texas Parks and Wildlife Department (TPWD) assist in the enforcement of Federal regulations, working hand in hand with the National Marine Fisheries, U.S. Coast Guard, and other Federal resource protection agencies.

Florida's Fish and Wildlife Commission's (FWC) Division of Law Enforcement is responsible for protecting Florida's natural resources, including fish, wildlife and the environment. FWC officers have full police powers and statewide jurisdiction. They patrol rural, wilderness and inshore and offshore areas and are often the sole law enforcement presence in many remote parts of the state. The Division has cooperative agreements with the NMFS and the U.S. Fish and Wildlife Service. Officers are also cross-deputized to enforce federal marine fisheries and wildlife laws, thus ensuring State and Federal consistency in resource-protection efforts.

The Enforcement Section of Marine Resources is responsible for enforcing state laws and regulations pertaining to Alabama's marine resources and working cooperatively with other State agencies and Federal fisheries enforcement agencies to protect fisheries resources in Federal waters adjacent to Alabama. The section also works with the U.S. Coast Guard, NOAA Office of Law Enforcement and the Alabama Law Enforcement Agency to accomplish their missions.

Compliance with laws and regulations is actively monitored, through a regime which may include at-sea and portside inspections, observer programmes, and VMS.

R4-R8; R12

References p32

Standard clause 1.3.1.3

CATEGORY A SPECIES

The four clauses in this section apply to Category A species. Clauses A1 - A4 should be completed for **each** Category A species. If there are no Category A species in the fishery under assessment, this section can be deleted. A Category A species must meet the minimum requirements of all four clauses before it can be recommended for approval. If the species fails any of these clauses it should be re-assessed as a Category B species.

Species Name	Gulf Menhaden *Brevoortia patronus*	
A1	**Data Collection - Minimum Requirements**	
A1.1	Landings data are collected such that the fishery-wide removals of this species are known.	PASS
A1.2	Sufficient additional information is collected to enable an indication of stock status to be estimated.	PASS
	Clause outcome:	**PASS**

Evidence
A 1.1
The commercial purse-seine reduction fishery for gulf menhaden has been extensively sampled by the NMFS. Fishery-dependent data sources from 1977-2017 that inform the stock assessment include:

- Detailed catch records that enumerate daily vessel landings.
- Port samples that include comprehensive dockside sampling of vessels throughout the fishing season at all menhaden factories for size and age composition of the catch.
- Daily logbooks that itemize catch and fishing locations for individual purse-seine sets.

Landings of gulf menhaden for bait are generally less than 2% of total landings for the species. Bait landings and recreational landings of gulf Menhaden, which are minimal, were combined with landings from the reduction fishery to provide a complete time series (1977-2017) of removals (**R10**).

Landings data are collected such that the fishery-wide removals of this species are known.
R10
A 1.2:
The five gulf states also collect a significant amount of fishery-independent data on finfish from inshore surveys. Although gulf menhaden are generally not target species of these surveys, total species numbers and lengths are recorded. Updated biological parameters such as estimates of mean weight at age and natural mortality are also used. Assessments include full consideration of the habitats preferred and required by the species.

In the 2018 assessment, the Beaufort Assessment Model (BAM, a forward-projecting age-structured model) was used. The model is a catch at age model using forward computations assuming separability of fishing mortality into year and age components to estimate population sizes given observed catches, catch-at-age, and indices of abundance. Recruitment of menhaden is highly episodic and is not well described by traditional stock recruitment relationships.

The base configuration of the BAM incorporated:

Fishing seasons 1977-2017, Ages 0 to 4+, Spawning occurring on January 1, Age-varying natural mortality scaled to an estimated based on a tagging study. Also:

- A single time series of landings. Commercial age compositions.
- A recruitment index based on seine data, an adult abundance index based on Louisiana gill net data.
- Length compositions from the gill net survey.
- A Beverton-Holt stock recruitment curve with a steepness fixed at 0.99.
- Logistic selectivity for the gill net index, dome-shaped selectivity for the reduction fishery.

Uncertainty was explored with BAM using sensitivity runs and Monte Carlo bootstrapping (MCB). Sensitivity runs for BAM investigated differences in the start year of the model, selectivity for the fishery, values of natural

mortality, the stock recruitment curve, weighting, index inclusion, and growth. MCB runs (N = 5,000) included uncertainty in all of the data streams, selectivity, and natural mortality.

Sufficient additional information is collected to enable an indication of stock status to be estimated.
R10

References p 32
Standard clause 1.3.2.1.1

A2	**Stock Assessment - Minimum Requirements**		
	A2.1	A stock assessment is conducted at least once every 3 years (or every 5 years if there is substantial supporting information that this is sufficient for the long-term sustainable management of the stock) and considers all fishery removals and the biological characteristics of the species.	PASS
	A2.2	The assessment provides an estimate of the status of the biological stock relative to a reference point or proxy.	PASS
	A2.3	The assessment provides an indication of the volume of fishery removals which is appropriate for the current stock status.	PASS
	A2.4	The assessment is subject to internal or external peer review.	PASS
	A2.5	The assessment is made publically available.	PASS
		Clause outcome:	**PASS**

Evidence
A 2.1:
A benchmark assessment, which modelled the years 1977 – 2011, was conducted in 2013 (SEDAR 32A, 2013) while an updated assessment, incorporating data from 2012 – 2015, was conducted in 2016 (GDAR02, 2016). More recently a benchmark assessment was undertaken in 2018 (SEDAR 63); a draft assessment report becoming available in October. This benchmark assessment covers the period 1977 – 2017.

A stock assessment is conducted at least once every 3 years and considers all fishery removals and biological characteristics of the species.
R10

A 2.2.
Biological reference points (benchmarks) were derived analytically assuming equilibrium dynamics. The Gulf menhaden fishery is managed using spawning potential ratio (SPR) benchmarks, as outlined in the 2015 FMP. The current threshold for fishing mortality is F=M, the current threshold for spawning stock biomass, measured as fecundity, is SSB25% at F=0. The current target for fishing mortality is F=0.75M, and the current target for spawning stock biomass, measured as fecundity, is SSB50% at F=0. Standard errors of benchmarks were approximated as those from the MCB analysis.

The assessment provides estimates of the status of the biological stock relative to reference points or proxies.
R10

A 2.3
Estimates of SSB/SSB25% of F=0 and SSB/SSB 50% at F=0 as time series were provided for the 2018 assessment. The history of SSB in these figures suggests that the population may have been near the overfished level in the past. Results indicate that the geometric mean of fecundity estimates for the terminal three years are well above SSB25% at F=0, with not a single bootstrap estimate falling below 1.0 (**Table 1**).

Table 1 Estimated status indicators, benchmarks, and related quantities from the Beaufort catch age model conditional on estimated current selectivity. Rate estimates (F) are in units of y-1, and status indicators are dimensionless. Spawning stock biomass is measured in total fecundity in million eggs R10, R12

Benchmarks and Terminal Years Geometric Means	Base BAM Model Estimates
R_0	116.5
Y at F_{MSY}	infinite
$F_{2015-2017}$	0.78
$F_{30\%}$	>10.0
$F_{35\%}$	>10.0
$F_{F=M}$	1.32
$F_{F=0.75M}$	0.99
F at $SSB_{25\% \text{ at } F=0}$	>10.0
F at $SSB_{50\% \text{ at } F=0}$	4.71
$SSB_{2015-2017}$	3,522,173
$SSB_{30\%}$	<2,074,992
$SSB_{35\%}$	<2,074,992
$SSB_{25\% \text{ at } F=0}$	1,244,281
$SSB_{50\% \text{ at } F=0}$	2,488,562
SSB at $F_{F=M}$	3,212,045
SSB at $F_{F=0.75M}$	3,408,847

Point estimates of the benchmarks were FF=M =1.32, FF=0.75M = 0.99, SSB25% at F=0 = 1,244,281, and SSB50% at =F=0 =2,488,562.

The time series of estimates of full fishing mortality over F F=M and FF=0.75M were also provided in the 2018 assessment. Fishing mortality rates suggests that overfishing occurred in the 1980s and 1990s but is unlikely to be occurring in the present.

Figure 3 indicates the status of fishing mortality and SSB (measured as fecundity) relative to biological reference points (benchmarks) from the base BAM model.
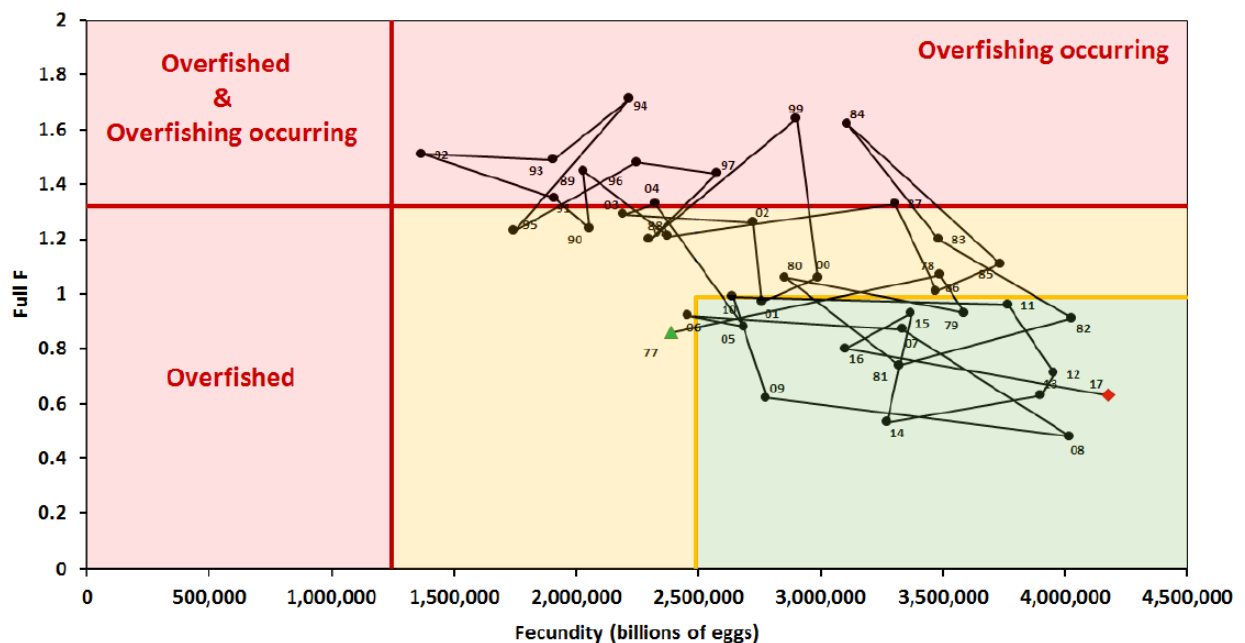
Figure 3: Phase plot (1977 – 2017) from the base run with fishing mortality benchmarks of F = M (threshold) and F = 0.75M (target) and associated spawning stock biomass (fecundity in billions of eggs) benchmarks of SSB25% at F=0 (threshold) and SSB50% at F=0 (target). Year is displayed beside each data point with the green triangle marking the first year and the red square marking the terminal year. R10

- Green zone indicates that the population is not overfished, and that overfishing is not occurring.

- Upper right yellow zone indicates that the stock is not overfished but overfishing is occurring.
- Bottom left yellow zone indicates that the stock is in an overfished state, but overfishing is not occurring.
- Red zone indicates that that the stock is in an overfished state and overfishing is occurring.

According to the latest assessment, the Gulf of Mexico Gulf menhaden population is not overfished, and overfishing is not occurring. Furthermore, there is very little risk of overfishing occurring or of the stock being overfished.

The fishery is not managed using a Total Allowable Catch (TAC) based system, but rather by technical measures. All five states manage the fishery with closed areas, restricted fishing seasons, limited licensing and other technical measures. Texas is currently the only gulf state which sets a TAC for menhaden of 14,288 mt annually. Once this quantity has been landed, the fishery is closed. Stock assessments indicate that these mechanisms have been effective at keeping fishing pressure below, and SSB (measured as fecundity) above, defined thresholds.

Louisiana and Alabama allow an additional season for the bait fishery after the reduction fishery closes. Louisiana's bait fishery runs from the end of the reduction season to December 1st or until the harvest quota of 3,000 metric tons is met. If the quota is not met before December 1st, an early bait season begins on April 1st of the following year. The reduction fishery does not operate in Florida's waters due to gear restrictions and area closures; there is a 1 million-pound (454 metric tons) harvest quota for the bait fishery in Florida' waters.

The assessment provides an indication of the volume of fishery removals appropriate for the current stock status
R10, R12

Standard clause 1.3.2.2, 1.3.2.1.2, 1.3.2.1.4
References p 32

A3	**Harvest Strategy - Minimum Requirements**		
	A3.1	There is a mechanism in place by which total fishing mortality of this species is restricted.	PASS
	A3.2	Total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment. Where a specific quantity of removals is recommended, the actual removals may exceed this by up to 10% ONLY if the stock status is above the limit reference point or proxy.	PASS
	A3.3	Commercial fishery removals are prohibited when the stock has been estimated to be below the limit reference point or proxy (small quotas for research or non-target catch of the species in other fisheries are permissible).	PASS
		Clause outcome:	**PASS**

Evidence
A 3.1:
NOAA's Office of Law Enforcement (OLE) investigates violations of marine resource protection laws. The Office of the General Counsel's Enforcement Section is NOAA's civil prosecutor. Together, the two offices make up NOAA's enforcement program.

OLE directly supports core mission mandates of NOAA Fisheries:
- Maximizing productivity of sustainable fisheries and fishing communities
- Protection, recovery, and conservation of protected species

OLE jurisdiction generally covers ocean waters between 3 and 200 miles offshore and adjacent to all US states and territories. The Southeast Division covers Federal waters off Texas, Louisiana, Mississippi, Alabama, Florida, Georgia, South Carolina and North Carolina. The United States Coast Guard, in Federal waters, is responsible for enforcing fishery management regulations adopted pursuant to management plans developed by GMFMC. The Fish and Wildlife Act (1956) aids States in the form of law enforcement training and cooperative law enforcement agreements.

Enforcement of fishing regulations is also the responsibility of individual States:
- Louisiana – Enforcement Division of the Louisiana Department of Wildlife and Fisheries.
- Mississippi – Marine Patrol of the Mississippi Department of Marine Resources.
- Texas – Marine Enforcement Section of the Texas Parks and Wildlife Department.
- Florida – Division of Law Enforcement of the Florida Fish and Wildlife Conservation Commission.
- Alabama – Marine Police Division of the Alabama Marine Resources Division.

There is a mechanism in place by which total fishing mortality of this species is restricted.
R12

A 3.2
The 2018 assessment model included a time series of landings that was a combination of landings from the commercial reduction purse seine fleet, commercial bait landings, and recreational landings for 1977‑2017. A large portion of the landings, ~99%, are from the commercial reduction fleet.

Landings were modelled with the Baranov catch equation (Baranov 1918) and fitted in units of 1,000s of metric tons (mt) (**Figure 4**):
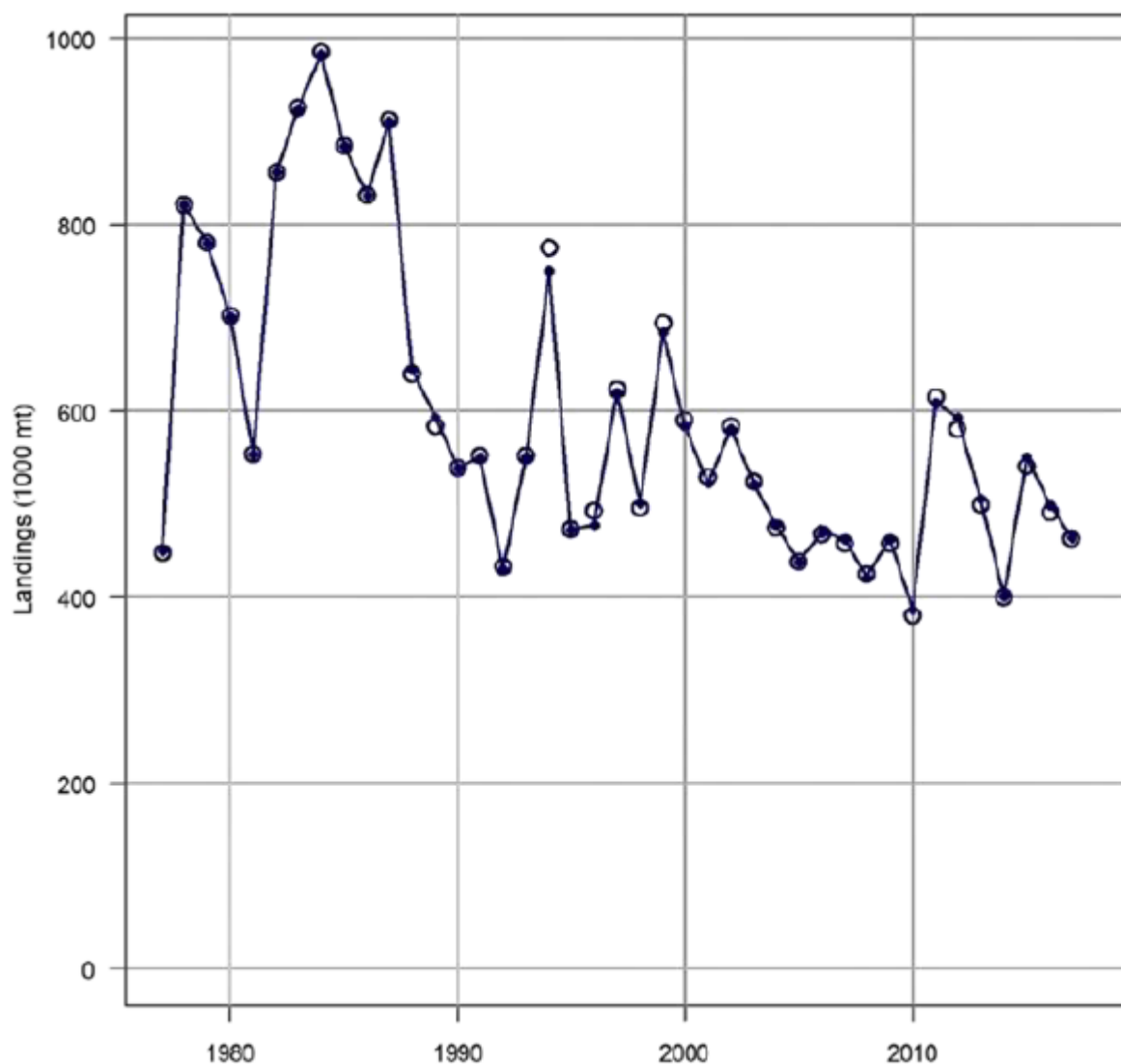

Figure 4 Observed (open circles) and estimated (line, solid circles) commercial reduction, commercial bait, and recreational landings (1,000s mt). R10

Commercial harvest exceeded 800,000 mt during much of the 1980s but declined afterwards to stabilize between 400,000 and 500,000 mt for much of the past decade. US GOM (Gulf of Mexico) menhaden landings in 2015 were approx. 535,700 t.

The current Harvest Control Rule (HCR) aims to keep exploitation levels below the reference target level of 663,583 mt annually; since the late-80s (1987), landings have only exceeded this level twice (1994 and 1999) and have not done so in the past 19 seasons. Evidence indicates that in the last 10 years the exploitation rate has resulted in the stock's fluctuating around the default biomass target stipulated by MSC (i.e. 75% B0).

Furthermore, fishing mortality (F) has significantly reduced such that, in recent years, it has been fluctuating around 0.5M with the most recent estimate (F_{2017}) being less than 0.5M [based on F2017 (0.63) < 0.5M (0.67)] (SEDAR 63, 2018).

Available evidence indicates that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs. In 2018, 34 vessels were involved in the Gulf Menhaden reduction fishery: 28 reduction fishing vessels, 5 run boats, and 1 bait vessel.

Total fishery removals of this species do not regularly exceed the level indicated or stated in the stock assessment.
R12

A 3.3
As the Gulf Menhaden fishery generally operates in State waters respective state marine agencies are responsible for regulating and monitoring the Gulf Menhaden fishing activities in their waters and provide management for the fishery directly.

In the 2015 revision to the FMP recommendations were made related to the adoption of reference points. Since the benchmark assessment (SEDAR 2013a) did not produce reliable estimates of MSY, levels of effort in reference to the MSY proxy (fecundity (SSB)) were selected as reference points by MAC and approved by GSMFC. Estimates of equilibrium landings associated with a reference target (F35%) and limit (F30%) levels were calculated at 663,583 mt and 680,765 mt, respectively. These harvest levels were designated as accountability measures to ensure the fishery remains viable.

In the event that two consecutive fishing years produce harvests exceeding the target F35%, a stock assessment update will be requested. If harvest surpasses the limit F30% in a single year, a stock assessment update will be requested.

Finally, it was recommended that a benchmark stock assessment should be conducted every five years in conjunction with a management plan revision and that forecasts of year class strength utilizing the state agencies fishery-independent data should be provided to GSMFC's MAC prior to the fishing season to help track fluctuations in population abundance and year class strength.

All GOM states have developed and implemented well-defined and longstanding Monitoring, Control and Surveillance (MCS) systems to enforce relevant management measures, strategies and/or rules for the fisheries and wildlife in their jurisdiction (land and water). States＇ MCS systems are informed by strategic objectives, goals and activities, including coordination with federal authorities (e.g. NOAA-NMFS for marine areas) through bilateral Joint Force Agreements (JFAs).

Commercial fishery removals are prohibited when the stock has been estimated to be below the limit reference point or proxy.
R1, R12

References p 32

Standard clause 1.3.2.1.3

A4	Stock Status - Minimum Requirements		
	A4.1	The stock is at or above the target reference point, OR IF NOT: The stock is above the limit reference point or proxy and there is evidence that a fall below the limit reference point would result in fishery closure OR IF NOT: The stock is estimated to be below the limit reference point or proxy, but fishery removals are prohibited.	PASS
		Clause outcome:	**PASS**

Evidence

A 4.1:

The base run configuration of BAM indicates that the stock is not experiencing overfishing and is not overfished. Sensitivity runs, and bootstrapping indicate that stock status is highly likely to be consistent with that indicated by the base run (**A 2.3**).

The stock is at or above the target reference point.

R10, R12

References p 32

Standard clause 1.3.2.1.4

CATEGORY D SPECIES

In a whole fish assessment, Category D species are those which make up less than 5% of landings and are not subject to a species-specific management regime. In the case of mixed trawl fisheries, Category D species may make up the majority of landings. In a by-product assessment, Category D species are those which are not subject to a species-specific management regime. In both cases, the comparative lack of scientific information on the status of the population of the species means that a risk-assessment style approach must be taken.

The process for assessing Category D species involves the use of a Productivity-Susceptibility Analysis (PSA) to further subdivide the species into 'Critical Risk', 'Major Risk' and 'Minor Risk' groups. If there are no Category D species in the fishery under assessment, this section can be deleted.

Productivity and susceptibility ratings are calculated using a process derived from the APFIC document "Regional Guidelines for the Management of Tropical Trawl Fisheries, which in turn was derived from papers by Patrick *et al* (2009) and Hobday *et al* (2007). Table D1 should be completed for each Category D species as follows:

- Firstly, the best available information should be used to fill in values for each productivity and susceptibility attribute.
- Table D2 should be used to convert each attribute value into a score between 1 and 3.
- The average score for productivity attributes and the average for susceptibility attributes should be calculated.
- Table D3 should be used to determine whether the species is required to meet the requirements of Table D4. A species which does not need to meet the requirements of D4 is automatically awarded a pass.
- Table D4 should be used to assess those species indicated by Table D3 to determine a pass/fail rating.
- Any Category D species which has been categorised by the IUCN Red List as Endangered or Critically Endangered, or which appears in the CITES appendices, automatically results in a fail.

D1	Species Name:	Yellowfin menhaden *Brevoortia smithi*		
	Productivity Attribute		**Value**	**Score**
	Average age at maturity (years)		1.4 - 2.3	1
	Average maximum age (years)		<10	1
	Fecundity (eggs/spawning)		>10,000	1
	Average maximum size (cm)		33	1
	Average size at maturity (cm)		20	1
	Reproductive strategy		Spawner	1
	Mean trophic level		2.3	1
		Average Productivity Score		**1**
	Susceptibility Attribute		**Value**	**Score**
	Overlap of adult species range with fishery		<10%	1
	Distribution		Not used	
	Habitat		Not used	
	Depth range		Low overlap based on landings	1
	Selectivity		Low overlap based on landings	3
	Post-capture mortality		Most conservative	3
		Average Susceptibility Score		**2.5**
		PSA Risk Rating (From Table D3)		**PASS**
		Compliance rating		**HIGH**

D1	Species Name:	Finescale menhaden *Brevoortia gunteri*		
	Productivity Attribute		**Value**	**Score**
	Average age at maturity (years)		1.3 – 2.1	1
	Average maximum age (years)		<10	1
	Fecundity (eggs/spawning)		>10,000	1
	Average maximum size (cm)		30	1
	Average size at maturity (cm)		18.5	1
	Reproductive strategy		Spawner	1
	Mean trophic level		2.4	1
		Average Productivity Score		**1**
	Susceptibility Attribute		**Value**	**Score**
	Overlap of adult species range with fishery		<10%	1
	Distribution		Not used	
	Habitat		Not used	
	Depth range		Low overlap based on landings	1
	Selectivity		Low overlap based on landings	3
	Post-capture mortality		Most conservative	3
		Average Susceptibility Score		**2**
		PSA Risk Rating (From Table D3)		**PASS**
		Compliance rating		**HIGH**

R15

References p 32

Standard clauses 1.3.2.2

D1	Species Name:	Atlantic thread herring *Opisthonema oglinum*		
	Productivity Attribute		**Value**	**Score**
	Average age at maturity (years)		1.9-2.4	1
	Average maximum age (years)		9	2
	Fecundity (eggs/spawning)		1,000,000	1
	Average maximum size (cm)		130	2
	Average size at maturity (cm)		30	1
	Reproductive strategy		Spawner	1
	Mean trophic level		4.5	3
		Average Productivity Score		**1.57**
	Susceptibility Attribute		**Value**	**Score**
	Overlap of adult species range with fishery		<10%	1
	Distribution		Not used	
	Habitat		Not used	
	Depth range		Low overlap based on landings	1
	Selectivity		Low overlap based on landings	3
	Post-capture mortality		Most conservative	3
		Average Susceptibility Score		**2**
		PSA Risk Rating (From Table D3)		**PASS**
		Compliance rating		**HIGH**

R13 References p 32

Table D2 - Productivity / Susceptibility attributes and scores.

Productivity attributes	Low productivity/ High risk — Score 3	Medium productivity/ Medium risk — Score 2	High productivity/ Low risk — Score 1
Average age at maturity (years)	>4	2 to 4	<2
Average maximum age (years)	>30	10 to 30	<10
Fecundity (eggs/spawning)	<1 000	1 000 to 10 000	>10 000
Average maximum size (cm)	>150	60 to 150	<60
Average size at maturity (cm)	>150	30 to 150	<30
Reproductive strategy	Live bearer, mouth brooder or significant parental investment	Demersal spawner "berried"	Broadcast spawner
Mean trophic level	>3.25	2.5–3.25	<2.5

Susceptibility attributes		High susceptibility/ High risk — Score 3	Medium susceptibility/ Medium risk — Score 2	Low susceptibility/ Low risk — Score 1
Availability	1) Overlap of adult species range with fishery	>50% of stock occurs in the area fished	Between 25% and 50% of the stock occurs in the area fished	<25% of stock occurs in the area fished
	2) Distribution	Only in the country/ fishery	Limited range in the region	Throughout region/ global distribution
Encounterability	1) Habitat	Habitat preference of species make it highly likely to encounter trawl gear (e.g. demersal, muddy/sandy bottom)	Habitat preference of species make it moderately likely to encounter trawl gear (e.g. rocky bottom/reefs)	Depth or distribution of species make it unlikely to encounter trawl gear (e.g. epi-pelagic or meso-pelagic)
	2) Depth range	High overlap with trawl fishing gear (20 to 60 m depth)	Medium overlap with trawl fishing gear (10 to 20 m depth)	Low overlap with trawl fishing gear (0 to 10 m, >70 m depth)
Selectivity		Species >2 times mesh size or up to 4 m length	Species 1 to 2 times mesh size or 4 to 5 m length	Species <mesh size or >5 m length
Post capture mortality		Most dead or retained Trawl tow >3 hours	Alive after net hauled Trawl tow 0.5 to 3 hours	Released alive Trawl tow <0.5 hours

Note: Availability 2 is only used when there is no information for Availability 1; the most conservative score between Encounterability 1 and 2 is used.

D3		Average Susceptibility Score		
		1.00 – 1.75	1.76 – 2.24	2.25 – 3.00
Average Productivity Score	1.00 – 1.75	PASS	PASS	PASS
	1.76 – 2.24	PASS	PASS	TABLE D4
	2.25 – 3.00	PASS	TABLE D4	TABLE D4

D4	Species Name		
	Impacts On Species Categorised as Vulnerable by D1-D3 - Minimum Requirements		
	D4.1	The potential impacts of the fishery on this species are considered during the management process, and reasonable measures are taken to minimise these impacts.	
	D4.2	There is no substantial evidence that the fishery has a significant negative impact on the species.	
		Outcome:	
Evidence			
References			
Standard clause 1.3.2.2			

FURTHER IMPACTS

The three clauses in this section relate to impacts the fishery may have in other areas. A fishery must meet the minimum requirements of all three clauses before it can be recommended for approval.

F1	**Impacts on ETP Species - Minimum Requirements**	
	F1.1	Interactions with ETP species are recorded.	PASS
	F1.2	There is no substantial evidence that the fishery has a significant negative effect on ETP species.	PASS
	F1.3	If the fishery is known to interact with ETP species, measures are in place to minimise mortality.	PASS
	Clause outcome:	PASS

Evidence

F 1.1

Table 2 includes all ETP species in the Gulf of Mexico recognized by national legislation and/or listed in binding international agreements. The fishery takes place in shallow coastal waters and is extremely unlikely to impact any species generally distributed in continental shelf (20 – 200 m) and/or oceanic waters (>200 m):

Table 2: Endangered, Threatened and Protected (ETP) species in the GOM recognized by national ETP legislation and/or listed in binding international agreements R12

Group	Species name	Latin	Listed	ETP Status
Dolphins	Bottlenose Dolphin	*Tursiops truncatus*	MMPA	Protected
	Striped Dolphin	*Stenella coeruleoalba*	MMPA	Protected
	Fraser's Dolphin	*Lagenodelphis hosei*	MMPA	Protected
	Melon-headed whale	*Peponocephala electra*	MMPA	Protected
	Risso's Dolphin	*Grampus griseus*	MMPA	Protected
	Pygmy Killer Whale	*Feresa attenuata*	MMPA	Protected
	Orca	*Orcinus orca*	MMPA	Protected
	Atlantic Spotted Dolphin	*Stenella frontalis*	MMPA	Protected
	Spinner Dolphin	*Stenella longirostris*	MMPA	Protected
	Clymene Dolphin	*Stenella clymene*	MMPA	Protected
	False Killer Whale	*Pseudorca crassidens*	MMPA	Protected
	Rough-toothed dolphin	*Steno bredanensis*	MMPA	Protected
	Pantropical spotted dolphin	*Stenella attenuata*	MMPA	Protected
	Short-finned pilot whale	*Globicephala macrorhynchus*	MMPA	Protected
Baleen whales	Minke Whale	*Balaenoptera acutorostrata*	MMPA	Protected
	Bryde's Whale	*Balaenoptera edeni*	MMPA	Protected
	Sei Whale	*Balaenoptera borealis*	MMPA, ESA	Endangered
	Fin Whale	*Balaenoptera physalus*	MMPA, ESA	Endangered
	Humpback Whale	*Megaptera novaeangliae*	MMPA, ESA	Endangered
	Blue Whale	*Balaenoptera musculus*	MMPA	Protected
	North Atlantic Right Whale	*Eubalaena glacialis*	MMPA, ESA	Protected
Toothed whales	Gervais' beaked whale	*Mesoplodon europaeus*	MMPA	Protected
	Blainville's beaked whale	*Mesoplodon densirostris*	MMPA	Protected
	Cuvier's beaked whale	*Ziphius cavirostris*	MMPA	Protected
	Sowerby's Beaked Whale	*Mesoplodon bidens*	MMPA	Protected
	Sperm Whale	*Physeter macrocephalus*	MMPA, ESA	Endangered
	Pygmy Sperm Whale	*Kogia breviceps*	MMPA	Protected
	Dwarf Sperm Whale	*Kogia sima*	MMPA	Protected
Manatee	Florida manatee	*Trichechus manatus latirostris*	MMPA, ESA	Endangered
Turtles	Green sea turtle	*Chelonia mydas*	ESA	Threatened
	Hawksbill sea turtle	*Eretmochelys imbricata*	ESA	Endangered
	Kemp's ridley sea turtle	*Lepidochelys kempii*	ESA	Endangered
	Leatherback sea turtle	*Dermochelys coriacea*	ESA	Endangered
	Loggerhead sea turtle	*Caretta caretta*	ESA	Threatened
Fish	Gulf sturgeon	*Acipenser oxyrinchus desotoi*	ESA	Threatened
	Nassau grouper	*Epinephelus striatus*	ESA	Threatened
	Smalltooth sawfish	*Pristis pectinata*	ESA	Endangered
Corals	Lobed star coral	*Orbicella annularis*	ESA	Threatened
	Mountainous star coral	*Orbicella faveolata*	ESA	Threatened
	Boulder star coral	*Orbicella franksi*	ESA	Threatened
	Elkhorn coral	*Acropora palmata*	ESA	Threatened

There are 28 different species of marine mammals known to occur in the Gulf all of which are protected under the Marine Mammal Protection Act (MMPA); of these, 6 are also listed as endangered under the Endangered Species Act (ESA) (sperm, sei, fin, blue, humpback and North Atlantic right whales).

Only 3 species of marine mammals (Atlantic spotted and Risso's dolphins), commonly occur in nearshore waters of the Gulf. Of the six ESA-listed whales only sperm whales commonly occur in the Gulf; no threatened or endangered species of whales are generally found in nearshore waters. Bottlenose dolphins are the most commonly observed marine mammal species in nearshore waters of the Gulf and are the only species of marine mammal recorded as being incidentally killed or injured in the menhaden fishery.

NMFS are required to implement monitoring programs to estimate human-caused mortality and serious injury of marine mammals from interactions with commercial fisheries, and to estimate the potential biological removal (PBR) for marine mammal stocks i.e. the maximum number of individuals that may be removed from that stock while allowing that stock to reach or maintain its optimum sustainable population.

Interactions are primarily with northern and western coastal stocks of bottlenose dolphins. While there are a small number of vessels (37 – 40) in the fleet there are a fairly large number of sets. Observer coverage has been limited with only a pilot program in 2011 in which three takes of marine mammals (bottlenose dolphins) were observed, all of which were released alive and uninjured. There were 13 self-reported takes from 2000 – 2013, previous analyses suggest as many as 57 mortalities occurred in the period 1992 – 1995.

Interactions with ETP species are recorded.
R12

F 1.2:
SAI Global MSC assessors concluded in their Final Report (June 2019) that:

''*There is a strategy in place for managing the Unit of Assessment (UOA) impact on ETP species, including measures to minimise mortality, designed to be highly likely to achieve national and international requirements for the protection of ETP species.*''

Section 117 of the MMPA requires NMFS and FWS to conduct stock assessment reports for each marine mammal stock in their respective jurisdictions. As part of each stock assessment various estimates are made including the stock's potential biological removal (PBR) level as a result of activity in the fishery. PBR level is an estimate of the number of individuals that could be taken as a result of human activities while still allowing the stock to recover to or remain within the envelope of its optimum sustainable population size.

PBR limits have been estimated for all four bottlenose dolphin stocks known to be impacted by the menhaden fishery. Based on data from 1992–1995 the fishery was classified as a Category II fishery (mortalities and serious injuries of a marine mammal stock > 1% and < 50% of the stock's PBR level. Category I fisheries are estimated to pose the greatest risk.

Since 1995 the number of vessels involved in the fishery has decreased and the use of hose cages has become ubiquitous across the menhaden fleet, meaning levels of incidental take have likely decreased. In addition, estimated PBRs for GOM dolphins' stocks have increased since the fishery was designated a category II fishery.

There is no substantial evidence that the fishery has a significant negative effect on ETP species.
R12

F 1.3:
A number of changes of fishing practices have been introduced to minimize the risk of interactions with bottlenose dolphins:

- If a pilot detects the presence of bottlenose dolphins in the proximity of a school of menhaden, they will not direct the purse seine vessel to set on that school of fish.
- When making a set and encircling a school of menhaden, if dolphins are observed within the school of menhaden, the purse seining will be stopped, and the school of menhaden allowed to escape.
- Steamers will not approach the encircling and cinching of the purse seine by the two purses seine boats to keep the menhaden from escaping the net, a standard practice that drives more menhaden into the purse net, when any marine mammals are in the area.
- Typically, bottlenose dolphins ride in the bow wake of the purse boats when they set the net, so when mammals are observed in such close proximity, the set will be discontinued.

As a Category II fishery all fishers participating in GOM menhaden fishery are required to accommodate an onboard observer upon request. NMFS may develop and implement take reduction plans for any Category II fishery that interacts with a strategic stock and fishers would then be required to implement these plans.

Any vessel owner or operator participating in the GOM menhaden fishery must report all incidental mortalities and injuries of marine mammals that occur during commercial fishing operations to NMFS within 48 hours of the end of the fishing trip. There were 13 self-reported takes from 2000‑2013, NMFS reported to the SAI Global MSC Assessment Team that since 2000 they received reports of 19 mortalities of bottlenose dolphin incidental to the fishery.

If the fishery is known to interact with ETP species, measures are in place to minimise mortality.
R12

References p 32

Standard clause 1.3.3.1

F2	**Impacts on Habitats - Minimum Requirements**		
	F2.1	Potential habitat interactions are considered in the management decision-making process.	PASS
	F2.2	There is no substantial evidence that the fishery has a significant negative impact on physical habitats.	PASS
	F2.3	If the fishery is known to interact with physical habitats, there are measures in place to minimise and mitigate negative impacts.	PASS
		Clause outcome:	**PASS**

Evidence
F 2.1:
In general purse seine gear is used exclusively in the water column and as result most purse seine fisheries have no physical impacts on the benthos. However, the menhaden fishery is different in that it is prosecuted in shallow gulf waters resulting in regular contact between the bottom and the fishing gear.

For each species managed by the GOM FMC a profile, habitat association table and map of essential fish habitats (EFH) have been created. EFH maps are defined based on five eco-regions: 1. South Florida; 2. North Florida 3. East Louisiana, Mississippi and Alabama, 4. East Texas and West Louisiana and 5. West Texas; three habitat zones (estuarine, nearshore, offshore) and specific habitat types.

Maps of EFH for each species managed by the GMFMC including for different life stages of that species, have been developed and are available online.

Other important habitats in the Gulf ecosystem, assessed in SAI Global's Final Report (June 2019) as Vulnerable Marine Ecosystems (VMEs) include salt marshes, mangroves, oyster reefs and seagrass beds. In their Final Report (June 2019) the SAI Global assessors concluded that the spatial extent of the menhaden fishery is known and there is minimal spatial overlap between it and any identified VMEs.

Potential habitat interactions are considered in the management decision-making process.
R12
F 2.2
The potential impacts of the fishing gear used in the menhaden fishery are well-understood with studies showing how pelagic fisheries have less effect on habitat than other gear types. In addition, the range of benthic habitats within the spatial extent of the fishery is well-studied. The location of each set of the fishing

gear is reported through the Captains Daily Fishing Reports (CDFR) and can be verified through VMS if required.

Due to the expense of the purse seine net and adverse publicity that follows fish spills resulting from net tears, every effort is made to ensure fishery operations are conducted over smooth muddy bottoms.

The main habitat impacted by the nGoM (Eastern, Northern, Western) menhaden fishery is mud/sand in shallow coastal waters, generally <15m (50ft). Predominant benthic sediment types in the area are terrigenous (derived from land-based sources) sands, silts and clays. Fine sediments such as these have been shown to be unstable in areas affected by waves and currents meaning that impacts from the fishery are likely less than those resulting from natural phenomena (storms, hurricanes etc.). There is evidence that the nGoM menhaden fishery is highly unlikely to reduce structure and function of commonly encountered habitats to a point where there would be serious or irreversible harm.

There is no substantial evidence that the fishery has a significant negative impact on physical habitats. If the fishery is known to interact with ETP species, measures are in place to minimise mortality.
R12
F 2.3:
The way in which the fishery operates combined with extensive knowledge of benthic habitats within its range, the spatial monitoring of menhaden fishing activity via VMS and the closure of areas likely to be vulnerable to bottom contact fishing gears constitute a strategy to mitigate negative impacts of the fishery on habitats.
R10, R12

| **References p 32** |
| *Standard clause 1.3.3.2* |

F3	**Ecosystem Impacts - Minimum Requirements**		
	F3.1	The broader ecosystem within which the fishery occurs is considered during the management decision-making process.	PASS
	F3.2	There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem.	PASS
	F3.3	If one or more of the species identified during species categorisation plays a key role in the marine ecosystem, additional precaution is included in recommendations relating to the total permissible fishery removals.	PASS
		Clause outcome:	**PASS**

Evidence
F 3.1:
The purposes of the 1986 Interjurisdictional Fisheries Act (IJF Act) are to:

- Promote and encourage State activities in support of the management of interjurisdictional fishery resources;
- Promote and encourage management of interjurisdictional fishery resources throughout their range;
- Promote and encourage research in preparation for the implementation of the use of ecosystems and interspecies approaches to the conservation and management of interjurisdictional fishery resources throughout their range.

The Magnuson Fishery Conservation and Management Act of 1976 (MSA) is the primary law governing marine fisheries management in US federal waters. First passed in 1976, the MSA fosters long-term biological and economic sustainability of the country's marine fisheries out to 200 nautical miles from shore.

Key objectives of the MSA are to:

- Prevent overfishing

- Rebuild overfished stocks
- Increase long-term economic and social benefits
- Ensure a safe and sustainable supply of seafood.

The Coastal Zone Management (CZM) Act (1972) encourages coastal states to develop and implement coastal zone management plans, thereby allowing States and the Federal government work together for the protection of U.S. coastal zones from overdevelopment of the environment.

States receive federal assistance grants to maintain federally-approved planning programs for enhancing, protecting, and utilizing coastal resources. These are State programs, but the act requires that Federal activities must be consistent with the respective states' CZM programs.

Depending upon individual state's program, the Act provides the opportunity for considerable protection and enhancement of fishery resources by regulation of activities and by planning for future development in the least environmentally damaging manner.
The broader ecosystem within which the fishery occurs is considered during the management decision-making process.
R21-R23

F3.2:

Gulf menhaden stock status with respect to ecosystem needs has been evaluated from 1977-2017. According to current MSC guidelines, expectations for key-LTL stocks (such as gulf menhaden) shall be a default biomass target level consistent with ecosystem needs of 75% of the spawning stock level that would be expected in the absence of fishing.

As of the latest stock assessment the catch at age model estimated current biomass (B_{2017}) to be 102% of biomass that would be expected in the absence of fishing which corresponds to 1.36 times the level expected to satisfy ecosystem needs. The stock is at or fluctuating around a level consistent with ecosystem needs.

There is no substantial evidence that the fishery has a significant negative impact on the marine ecosystem.
R12

F 3.3:
The Gulf menhaden purse seine fishery is highly targeted, exploiting highly homogeneous shoals. Yields comprise high proportions (up to 99%) of the target species. Yellowfin menhaden (*Brevoortia smithi*), Finescale menhaden (*Brevoortia gunteri*) and Atlantic thread herring (*Opisthonema oglinum*) may also be incidentally harvested. Catches of these species, representing less than 1% of total catches, occur primarily at the Eastern and Western edges of area of activity of the menhaden fleet.

In this fishery assessment no additional species have been identified as playing a key role in the marine ecosystem.

References

R1 - Gulf Menhaden Fishery Management Plan (2015 Revision):

http://www.gsmfc.org/publications/GSMFC%20Number%20240.pdf

R2 - GSMFC: Menhaden Factsheet

R3 – GSMFC: https://www.gsmfc.org/

R4 - Florida Fish and Wildlife Conservation Commission: https://myfwc.com

R5 - Alabama Department of Conservation and Natural Resources: https://www.outdooralabama.com/top-navigation/contact-us

R6 - Department of Wildlife and Fisheries (Louisiana**)** http://www.wlf.louisiana.gov/

R7 - Department of Marine Resources (Mississippi) http://dmr.ms.gov/

R8 - Texas Parks and Wildlife Department https://tpwd.texas.gov

R9 – NOAA National Marine Fisheries Service (NMFS): https://www.fisheries.noaa.gov/about-us

R10 - SEDAR Gulf Menhaden Fishery Assessment Report (2018) http://sedarweb.org/sedar-63

R11 - Gulf of Mexico Fishery Management Council http://www.fisherycouncils.org/gulf-of-mexico

R12 - Marine Stewardship Council Full Assessment Final Report (SAI Global Ltd) June 2019:

https://fisheries.msc.org/en/fisheries/u.s.-gulf-of-mexico-menhaden-purse-seine/@@assessments

R13 Fishbase**:** Atlantic thread herring

https://www.fishbase.se/Summary/SpeciesSummary.php?ID=1486&AT=thread+herring

R14 Fishbase: Yellowfin menhaden

https://www.fishbase.se/Summary/SpeciesSummary.php?ID=1591&AT=Yellowfin+menhaden

R15 Fishbase: Finescale menhaden   *Brevoortia gunteri*

https://www.fishbase.se/Summary/SpeciesSummary.php?ID=1588&AT=Finescale+menhaden

R16 Florida Fish and Wildlife Conservation Commission (April 2017) Commission Meeting

https://myfwc.com/about/commission/commission-meetings/april-2017/

R17 Alabama DCNR Conservation Advisory Board:

https://www.outdooralabama.com/about-us/conservation-advisory-board

R18 Department of Marine Resources (Mississippi) http://dmr.ms.gov/index.php/news-a-events/public-notices

R19 Department of Wildlife and Fisheries (Louisiana**)** http://www.wlf.louisiana.gov/fishing/how-we-manage-fisheries

R20 Texas Parks and Wildlife Commission Meetings https://tpwd.texas.gov/business/feedback/meetings/

R21 Interjurisdictional Fisheries Act of 1986, Public Law 99-659, Title III, 16 U.S.C.

http://www.fedprogramsearch.com/cfda/interjurisdictional_fisheries_act_of_1986.htm

R22 NOAA Office of Law Enforcement (OLE): https://www.fisheries.noaa.gov/topic/enforcement

R23 Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act MSA):

https://www.fisheries.noaa.gov/resource/document/magnuson-stevens-fishery-conservation-and-management-act

R24 Coastal Zone Management Act of 1972 (CZM Act):

https://coast.noaa.gov/czm/media/CZMA_10_11_06.pdf

Standard clause 1.3.3.3