Status Determination Criteria for the Penaeid Shrimp



Draft Amendment 20

to the Fishery Management Plan for the Shrimp Fishery of the Gulf, U.S. Waters

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ABBREVIATIONS USED IN THIS DOCUMENT

ABC	acceptable biological catch
ACL	annual catch limit
AM	accountability measure
BiOp	biological opinion
BRD	bycatch reduction device
CFR	code of federal regulations
Council	Gulf Council
CPUE	catch-per-unit-effort
DPS	distinct population segments
E.O.	Executive Order
EA	Environmental Assessment
EDM	Empirical Dynamic Modeling
EEZ	exclusive economic zone
EFH	essential fish habitat
EIS	environmental impact statement
ELB	electronic logbook
FMP	Fishery Management Plan
GMFMC	Gulf of Mexico Fishery Management Council
Gulf	Gulf of America (Formerly Gulf of Mexico)
Magnuson-Stevens Act	Magnuson-Stevens Fishery Conservation and Management Act
MFMT	maximum fishing mortality threshold
mp	million pounds
mpt	million pounds of tails
MSST	minimum stock size threshold
MSY	maximum sustainable yield
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
OFL	overfishing limit
OMB	Office of Management and Budget
OY	optimum yield
RFA	Regulatory flexibility analysis
RIR	Regulatory Impact Review
Secretary	Secretary of Commerce
SEDAR	Southeast Data, Assessment, and Review
SEFSC	Southeast Fisheries Science Center
SERO	Southeast Regional Office
TED	turtle excluder device

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CHAPTER 1. INTRODUCTION

1.1 Background

The Gulf of America (Gulf) shrimp fishery is managed by the Gulf Council (Council) through the Fishery Management Plan (FMP) for the Shrimp Fishery of the Gulf, U.S. Waters (Shrimp FMP). Four species are included under the Shrimp FMP: brown shrimp, *Farfantepenaeus aztecus*; pink shrimp, *Farfantepenaeus duorarum*; white shrimp, *Litopenaeus setiferus*; and royal red shrimp, *Pleoticus robustus*. This action addresses the results of the recent stock assessment for penaeid shrimp (brown, pink, and white shrimp). Royal red shrimp will not be addressed in this amendment.

Statutory Requirements

National Standard 1 of the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) states that conservation and management measures shall prevent overfishing while achieving, on a continuing basis, the optimum yield (OY) from each fishery. Optimum yield is the amount of harvested fish that will provide the greatest overall benefit to the nation, particularly with respect to food production and recreational opportunities, while considering the protection of marine ecosystems, and is based on the maximum sustainable yield (MSY) from the fishery, as reduced by any relevant economic, social, or ecological factor. The National Standard 1 Guidelines explain that the Magnuson-Stevens Act establishes MSY as the basis for fishery management and defines MSY as the largest long-term average catch that can be taken from a stock under prevailing conditions. Each FMP must specify MSY, OY, and objective and measurable status determination criteria (SDC) for identifying when the fishery is overfished or undergoing overfishing. Overfishing occurs whenever the rate of removal (fishing mortality rate) is too high. A stock or stock complex is considered overfished when its population abundance (biomass) is too low. The Magnuson-Stevens Act also requires annual catch limits (ACL) and accountability measures (AM), but includes an exemption for species that have a life cycle of approximately 1 year, such as penaeid shrimp, unless the Secretary of Commerce (Secretary) has determined the species is subject to overfishing.

The National Standard 1 Guidelines require setting an acceptable biological catch (ABC), which is an annual catch level recommended by the Council's Scientific and Statistical Committee (SSC) that considers scientific uncertainty, and may be set as equal to or less than the overfishing level. The guidelines at 50 CFR 600.310(h)(1)(i) recognize that species with annual life cycles are exempt from the ACL and AM requirements. However, SDC and biological reference points must still be included in the FMP:

> Exceptions from ACL and AM requirements —(i) Life cycle. Section 303(a)(15) of the Magnuson-Stevens Act "shall not apply to a fishery for species that have a life cycle of approximately 1 year unless the Secretary has determined the fishery is subject to overfishing of that species" (Pub. L. 109-479 104(b)(2)). This exception applies to a stock for which the average age of spawners in the population is approximately 1 year or less. While exempt from the ACL and AM requirements, FMPs or FMP amendments for these stocks must have SDC, MSY, OY, ABC, and an ABC control rule.

Penaeid Shrimp Stock Assessments

Over the years, Gulf shrimp stocks have been assessed using various model types that produced different outputs (virtual population analysis - parent stock numbers [Hart and Nance 2010]; Stock Synthesis model – spawning biomass [Methot and Wetzel 2013]). For brown and white shrimp, these assessments concluded that the stocks were not overfished or undergoing overfishing. However, these models had issues assessing pink shrimp abundance due to low fishing effort for the species (Nance 2008). Unfortunately, these issues continue to the present.

In June 2019, Southeast Fisheries Science Center (SEFSC) staff convened an internal model review workshop and recommended that alternative approaches to the Stock Synthesis assessment models be explored due to Stock Synthesis being an age-structured model ill-suited for short-lived, annual species like shrimp, for which there is no age data. The Empirical Dynamic Modeling (EDM) approach was selected because it is well suited to characterizing population trends for species that are strongly influenced by environmental conditions with large year-to-year variations in abundance (e.g., penaeid shrimp) (Tsai et al., 2024). Unlike age-structured stock assessment models that attempt to directly model population dynamics, EDM uses long-term observations to identify patterns between the population size and relevant environmental conditions.

A Southeast Data, Assessment, and Review process was completed in 2025 for the three Gulf penaeid shrimp stocks (SEDAR 87). This stock assessment was reviewed by the Council's SSC in February 2026.[1] Based on the SEDAR 87 assessment, the SSC recommended values for MSY and SDC for white and brown shrimp based on the EDM approach. This approach allowed stock assessment analysts to make better use of available data, while still producing robust MSY estimates for white and brown shrimp. Although fishery-independent trawl CPUE data – such as the Southeast Area Monitoring and Assessment Program (SEAMAP) summer and fall surveys[2] – were evaluated for all three penaeid assessments, the EDM approach was not successful for pink shrimp due to the short time series of data (2010-2022 with summer 2020 missing) and no discernible trend in the index time series (SEDAR 87 2025). For these reasons, the SSC considered and recommended an alternate approach for setting MSY and SDC for pink shrimp based on the third highest landings estimate until such time that the EDM approach could be used.

For Gulf penaeid shrimp stocks, Amendment 13 to the Shrimp FMP (GMFMC 2005) established OY as equal to MSY for each of the penaeid shrimp stocks. At the time, the Shrimp Stock Assessment Panel made this recommendation for OY because there did not appear to be any biological or economic reason to set OY at a level below MSY since these are annual stocks whose abundance in a given year is dictated primarily by environmental conditions rather than fishing mortality. Amendment 15 to the Shrimp FMP (GMFMC 2015) used data from a Stock Synthesis model to establish MSY values and SDC values for each of these stocks.

[1] The Standing and Special Shrimp SSCs made these recommendations at the February 2026 meeting. https://gulf-council-media.s3.amazonaws.com/uploads/2026/03/Gulf-Standing-and-Shrimp-SSC-Summary-Feb-2026.pdf

[2] While SEAMAP data were evaluated for white shrimp, the Indices Workgroup at the Data Workshop selected the Louisiana Department of Wildlife and Fisheries' survey data as most representative for white shrimp across all age classes; 1980-2022 fishery-independent data from the survey were used. https://sedarweb.org/documents/sedar-87-gulf-of-america-white-shrimp-final-stock-assessment-report-updated-6-1-2026/

The actions in this amendment would update the MSY and SDC for the three penaeid shrimp species based on the new science. Exploring a new method to designate OY (apart from modifying the MSY values) is not considered in this amendment. This amendment would also establish an ABC for each stock, consistent with the National Standard 1 Guidelines.

1.2 Purpose and Need

The purpose of this action is to establish or modify MSYs, ABCs, overfishing thresholds, and overfished thresholds for the Gulf penaeid shrimps.

The need for this action is to have biological reference points that can be used for determining status of the Gulf shrimp penaeid stocks.

IPT recommendation, inclusive of Shrimp AP feedback:

The need for this action is to have biological reference points and status determination criteria for Gulf shrimp penaeid stocks based on the best available science.

1.3 History of Management

The following summary describes management actions that address the stock status of Gulf shrimp. More information on the Shrimp FMP can be obtained from the Council.[3] A history of shrimp management through 2026 is presented in Amendment 19 to the Shrimp FMP.[4]

The **Shrimp FMP** (GMFMC 1981) defined the shrimp fishery management unit to include brown shrimp, white shrimp, pink shrimp, royal red shrimp, seabobs (*Xiphopenaeus kroyeri*), and brown rock shrimp (*Sicyonia brevirostris*). The purpose of the plan was to enhance yield in volume and value by deferring harvest of small shrimp to provide for growth. The main actions included: 1) establishing a cooperative Tortugas Shrimp Sanctuary with Florida to close a shrimp trawling area where small pink shrimp comprise the majority of the population most of the time; 2) a cooperative 45-day seasonal closure with Texas to protect small brown shrimp emigrating from bay nursery areas; and 3) a seasonal closure of an area east of the Dry Tortugas to avoid gear conflicts with stone crab fishermen.

Amendment 5 (GMFMC 1991) defined overfishing for Gulf brown, pink, and royal red shrimp and provided measures to restore overfished stocks if overfishing should occur. Action on the definition of overfishing for white shrimp was deferred, and seabobs and rock shrimp were removed from the management unit. The duration of the seasonal closure to shrimping off Texas was changed from June 1 through July 15 to May 15 through July 15 to conform to changes in state regulations.

Amendment 6 (GMFMC 1992) eliminated the annual reports and reviews of the Tortugas Shrimp Sanctuary in favor of monitoring and an annual stock assessment. Three seasonally

[3] https://gulfcouncil.org/fishery-management/implemented-amendments/shrimp/
[4] https://gulf-council-media.s3.amazonaws.com/uploads/2025/03/Final-Shrimp-Amendment-18.pdf/

opened areas within the sanctuary continue to open seasonally, without need for annual action. A proposed definition of overfishing of white shrimp was rejected by NMFS because it was not based on the best available data.

Amendment 7 (GMFMC 1994) defined overfishing for white shrimp and provided for future updating of overfishing indices for brown, white, and pink shrimp as new data became available. A total allowable level of foreign fishing for royal red shrimp was eliminated; however, a redefinition of overfishing for royal red shrimp was disapproved.

Amendment 8 (GMFMC 1995), implemented in early 1996, addressed management of royal red shrimp. It established a procedure that would allow total allowable catch for royal red shrimp to be set up to 30% above MSY for no more than two consecutive years so that a better estimate of MSY could be determined. This action was subsequently negated by the 1996 Sustainable Fisheries Act amendment to the Magnuson-Stevens Act that defined overfishing as a fishing level that jeopardizes the capacity of a stock to maintain MSY and does not allow OY to exceed MSY.

Amendment 13 (GMFMC 2005) established an endorsement to the federal commercial shrimp vessel permit for vessels harvesting royal red shrimp; defined the overfishing and overfished thresholds for royal red shrimp; defined MSY and OY for the penaeid shrimp stocks in the Gulf; established bycatch reporting methodologies and improved collection of shrimping effort data in the EEZ; required completion of a Gulf Shrimp Vessel and Gear Characterization Form by vessels with federal shrimp permits; established a moratorium on the issuance of federal commercial shrimp vessel permits; and required reporting and certification of annual landings during the moratorium.

The Generic Annual Catch Limit (ACL)/Accountability Measures (AM) Amendment (GMFMC 2011) set an ACL and AM for royal red shrimp. Penaeid shrimp were exempt from the ACL/AM requirements because of their annual life cycle.

Amendment 16 (GMFMC 2014) eliminated duplicative AMs and the quota for royal red shrimp. The ACL was set equal to the acceptable biological catch and a post-season AM was established.

Amendment 15 (GMFMC 2015) redefined stock status criteria for the three penaeid species of shrimp including MSY and overfished/overfishing thresholds. The general framework procedure was also updated.

Amendment 17B (GMFMC 2017) defined the aggregate MSY of 112,531,374 pounds of tails for all shrimp species and an aggregate OY of 85,761,596 pounds of tails for all shrimp species. This amendment allows for the creation of a reserve permit pool when certain conditions are met, and mandates that the Council convene a review panel to review the details of a permit pool if the number of permits reaches 1,175. This amendment also allows vessels possessing shrimp to transit through federal waters without a federal permit if their trawl doors and nets are out of the water and bag straps are removed.

1.4 Description of the Physical, Biological, and Ecological Environment

FORTHCOMING

1.5 Description of the Economic Environment

FORTHCOMING

1.6 Description of the Social Environment

FORTHCOMING

CHAPTER 2. MANAGEMENT ALTERNATIVES

2.1 Action 1: Modify the Maximum Sustainable Yield (MSY) for Penaeid Shrimp

Alternative 1: No Action. Maintain the current MSY values for the penaeid shrimp stocks as follows:

- Brown shrimp: MSY is 146,923,100 pounds (lb) of tails
- White shrimp: MSY is 89,436,907 lb of tails
- Pink shrimp: MSY is 17,345,130 lb of tails

Alternative 2: Revise the MSY values for the penaeid shrimp stocks based on the results of the Southeast Data, Assessment, and Review (SEDAR) 87 stock assessments and recommendations of the Gulf Council's (Council) Scientific and Statistical Committee (SSC) as follows:

- Brown shrimp: MSY is 215,070,000 lb of tails
- White shrimp: MSY is 87,800,000 lb of tails
- Pink shrimp: MSY proxy is 19,300,000 lb of tails

Discussion:

Alternative 1 would maintain the MSY values established in Amendment 15 to the Shrimp Fishery of the Gulf (Shrimp FMP; GMFMC 2015). These values were estimated using a Stock Synthesis model and are not based on the best scientific information available. Therefore, **Alternative 1** is not a viable alternative.

The MSY values for brown and white shrimp in **Alternative 2** are estimated through use of the Empirical Dynamic Modeling (EDM) approach and were recommended as consistent with the best scientific information available by the SSC. As pink shrimp have a shorter time series of fishery-independent trawl data than brown or white shrimp (2010 – 2022 for pink shrimp, compared to 1980 – 2022 for white and 1987 - 2022 for brown shrimp), the EDM approach was not successful for pink shrimp. Once a longer time series of fishery-independent data are available, application of the EDM approach to pink shrimp can be reconsidered. Instead, the SSC considered use of the third highest catch or the average from a reference time series as an appropriate alternative approach to Tier 3 of the Acceptable Biological Catch (ABC) Control Rule since Tier 3 was not designed with annual crop species in mind. The SSC noted that use of an average from recent years may not be appropriate since recent landings may be biased by the contraction of shrimping effort driven by economic factors, and therefore not representative of what the pink shrimp stock is capable of producing. The SSC recommended using the third highest catch of pink shrimp, which occurred in 1996 as seen in Table 2.1.1, as an MSY proxy for informing management advice. The SSC made this recommendation after consideration of research (Carruthers et al., 2014) that evaluated methods to set catch limits in data-limited fisheries, which currently applies to pink shrimp. The South Atlantic Fishery Management Council has used the third highest catch over the last decade in setting the overfishing limit (OFL), and the research found the management approach to be successful for short-lived species.

In comparison with **Alternative 1**, the MSY values in **Alternative 2** increase for brown shrimp by 68.1 mpt and decrease for white shrimp by 1.6 mpt. The MSY proxy for pink shrimp is set 2.0 mpt higher than the status quo MSY value. For the penaeid shrimp stocks using the EDM approach to determine MSY values (brown and white), the models could be updated with new data if the Council identifies substantial shifts in fishery dynamics or environmental data, or if landings begin to approach MSY levels of harvest.

Table 2.1.1. Landings of Gulf penaeid shrimp (lb of tails) from 1960-2025.

Year	Brown Shrimp	White Shrimp	Pink Shrimp
1960	61,787,343	28,128,567	20,658,592
1961	29,337,308	13,286,812	9,457,389
1962	26,620,055	18,376,826	15,329,969
1963	44,595,570	37,911,412	17,998,991
1964	33,170,644	35,949,464	20,986,099
1965	49,586,453	26,353,833	14,106,139
1966	50,881,790	23,698,216	12,986,068
1967	83,993,526	19,877,150	8,972,168
1968	63,881,322	26,363,949	10,168,061
1969	56,516,843	39,441,753	9,891,776
1970	68,679,925	40,579,303	11,929,699
1971	75,525,205	38,176,369	10,124,270
1972	75,945,513	32,809,046	10,811,607
1973	47,873,467	30,722,335	13,992,645
1974	50,759,468	26,874,478	14,374,393
1975	48,279,340	25,742,846	13,747,431
1976	77,863,267	36,518,116	13,021,513
1977	96,919,453	46,209,815	16,204,603
1978	87,508,037	48,036,180	16,011,393
1979	71,403,312	34,856,133	13,846,691
1980	68,269,927	42,705,545	12,877,492
1981	99,508,484	46,108,156	18,773,126
1982	74,804,488	39,219,608	11,644,028
1983	61,352,577	42,189,194	12,628,671
1984	82,204,088	55,958,235	14,698,527
1985	87,155,338	58,854,018	15,930,980
1986	100,564,407	70,052,138	11,723,343
1987	94,070,956	52,833,598	10,486,082
1988	82,840,325	44,638,937	9,135,939
1989	96,348,265	36,117,305	8,622,144
1990	105,912,096	43,701,941	7,454,083
1991	89,467,559	45,244,280	6,790,159
1992	70,831,209	47,342,282	6,341,170
1993	69,832,922	38,577,835	9,488,603
1994	68,881,037	45,334,632	10,088,773

Year	Brown Shrimp	White Shrimp	Pink Shrimp
1995	78,839,517	48,662,618	14,058,321
1996	76,339,327	35,430,587	19,341,126
1997	68,274,442	38,566,210	12,688,112
1998	81,615,721	54,187,635	17,164,094
1999	83,684,364	54,098,203	8,029,582
2000	98,915,715	70,635,889	7,453,209
2001	91,687,919	53,882,461	9,701,158
2002	77,081,963	52,542,091	7,976,185
2003	86,744,282	59,863,329	7,982,908
2004	76,551,766	66,544,100	8,483,883
2005	60,203,058	63,820,247	7,126,421
2006	89,980,622	85,096,181	6,269,021
2007	73,808,197	65,029,884	3,340,186
2008	52,738,758	64,904,720	4,792,855
2009	77,521,931	73,674,720	3,929,138
2010	45,794,802	57,976,051	5,366,146
2011	74,472,991	56,978,888	4,387,888
2012	66,114,439	66,350,697	3,628,168
2013	67,556,105	55,537,885	3,799,340
2014	67,936,991	60,046,485	6,128,795
2015	64,710,562	53,664,229	5,327,272
2016	49,174,362	69,041,766	5,160,508
2017	56,933,324	68,755,567	11,345,340
2018	71,088,440	51,580,415	12,876,965
2019	40,952,047	65,686,250	7,635,077
2020	41,552,518	58,825,117	7,616,625
2021	42,857,319	62,800,466	7,872,307
2022	32,381,740	68,192,117	9,895,287
2023	38,637,388	59,664,751	8,440,463
2024	21,254,844	59,389,239	5,750,507

Source: SEFSC Gulf Shrimp Database (1965-2025), accessed May 2026.

2.2 Action 2: Modify the Overfishing Status Determination Criteria for Penaeid Shrimp

Alternative 1: No Action. Maintain the current overfishing limit for the penaeid shrimp stocks, defined as the maximum fishing mortality threshold (MFMT). The MFMT for each penaeid shrimp stock is defined as the instantaneous fishing mortality rate at MSY (F_{MSY}). Species-specific F_{MSY} values are as follows:

- Brown shrimp: 9.12^{y-1}
- White shrimp: 3.48^{y-1}
- Pink shrimp: 1.35^{y-1}

Alternative 2: Revise the overfishing status determination criteria to include the OFL for the penaeid shrimp stocks equal to the MSY or MSY proxy resulting from the SEDAR 87 stock assessments, following recommendations from the Council's SSC. The OFL values are as follows:

- Brown shrimp: 215,070,000 lb of tails
- White shrimp: 87,800,000 lb of tails
- Pink shrimp: 19,300,000 lb of tails

Discussion:

The National Standard 1 Guidelines require one of two thresholds be developed to determine if a stock is undergoing overfishing: the MFMT or the OFL. The MFMT is the maximum rate of fishing mortality above which the stock is considered to be undergoing overfishing. The OFL is the catch level associated with fishing at MFMT, and in this case, OFL is equal to MSY.

Alternative 1 would maintain the overfishing limit values established in Amendment 15 to the Shrimp FMP (GMFMC 2015). **Alternative 1** maintains F in terms of MSY produced using data from fishing years 1984 through 2012 and is not based on the best scientific information available. Therefore, **Alternative 1** is not a viable alternative.

Alternative 2 would revise the overfishing status determination criteria to use OFLs for the penaeid shrimp stocks. The data limitations for pink shrimp discussed in Action 1 apply in this action also. The MFMT values from **Alternative 1** cannot be directly compared to the fishing mortality values obtained in SEDAR 87 because the underlying model structures and mechanics are different (see Appendix B for details).

In the Sustainable Fisheries Act Amendment (GMFMC 1999), the response to a possible overfishing determination was set to trigger only when overfishing persisted for two consecutive years. This was primarily in response to the biology of the shrimp stocks and the environmental influence on the stocks. Penaeid shrimp rarely live longer than 18 months, and stock size is driven by annual variability in environmental conditions. This provision for responding to fishery conditions is continued in the current amendment.

2.3 Action 3: Modify the Minimum Stock Size Threshold (MSST) for Penaeid Shrimp

Alternative 1: No Action. Maintain the current minimum stock size threshold for penaeid shrimp stocks. The MSST for each penaeid shrimp stock is defined as the biomass at MSY (B_{MSY}). The overfished threshold values are as follows:

- Brown shrimp: B_{MSY} (6,098,824 lb of tails)
- White shrimp: B_{MSY} (365,715,146 lb of tails)
- Pink shrimp: B_{MSY} (23,686,906 lb of tails)

Alternative 2: Revise the MSST for the penaeid shrimp stocks based on the results of the SEDAR 87 stock assessments and recommendations of the Council's SSC as follows:

- Brown shrimp: B_{MSY} (405,390,000 lb of tails)
- White shrimp: B_{MSY} (148,350,000 lb of tails)
- Pink shrimp: undefined

Alternative 3: Revise the MSST for the penaeid shrimp stocks based on the results of the SEDAR 87 stock assessments and recommendations of the Council's SSC as follows:

- Brown shrimp: $0.50*B_{MSY}$ (202,695,000 lb of tails)
- White shrimp: $0.50*B_{MSY}$ (74,175,000 lb of tails)
- Pink shrimp: B_{MSY} is undefined

Discussion:

The MSST is the level of biomass below which the stock is considered to be overfished.

Alternative 1 would maintain the MSST values established in Amendment 15 to the Shrimp FMP (GMFMC 2015). These values were estimated using data from 1984 through 2012 and are no longer based on the best scientific information available. In addition, the values for the pink and white shrimp stocks are incorrect because they were derived by multiplying the monthly models' output by twelve, which would be appropriate for summing landings but is not appropriate for estimating biomass.[5] For these reasons, **Alternative 1** is not a viable alternative, and the values are not directly comparable to **Alternatives 2** or **3.**

Alternatives 2 and **3** would revise the overfished threshold values for brown and white shrimp based on SEDAR 87 and the SSC's recommendations. In comparison with **Alternative 1**, the overfished threshold values in **Alternatives 2** and **3** increase for brown shrimp. The notable difference in MSST values for brown shrimp from **Alternative 1** to those alternatives using the EDM approach stems, in part, from how carrying capacity is defined across modeling frameworks. The Stock Synthesis model relies on static equilibrium assumptions (e.g., fixed long-term baselines for B_0 and B_{MSY}). In contrast, the EDM approach dynamically captures shifts in carrying capacity driven by varying environmental conditions. **Alternative 3** is set at 50% of $B_{MSY,}$ respectively. The National Standard 1 Guidelines allow MSST to be set at a level

[5] Amendment 15 to the Shrimp FMP, in the Discussion of Action 1.3, states that "Brown shrimp had a seasonal output, so no multiplication factor was used."

below B_{MSY} but no lower than 0.50*B_{MSY} to allow for environmentally driven fluctuations in stock size. In comparison with **Alternative 2**, **Alternative 3** reduces the likelihood that the overfished threshold would be met for brown and white shrimp. The data limitations for pink shrimp discussed in Action 1 also apply to this action. Thus, the overfished threshold value for pink shrimp would be undefined under **Alternatives 2** and **3**.

Amendment 15 (GMFMC 2015) noted that the Shrimp Advisory Panel recommended that values be below the MSST for two years in a row before a stock is designated as overfished because a single year below MSST might be indicative of environmental conditions and not necessarily an overfished condition. However, the National Standard 1 Guidelines mandate that a stock be declared overfished when its biomass drops below the MSST. This status determination is made by NMFS based on updated data and stock assessment model runs. Under the Magnuson-Stevens Act, once NMFS notifies the Council that a stock is overfished, the Council has two years to develop and implement a rebuilding plan. Due to the biology and population dynamics of shrimp, and their high sensitivity to environmental variability, the stock may naturally rebound and no longer be overfished by the time management measures take effect.

2.4 Action 4: Establish an ABC for Penaeid Shrimp

Alternative 1: No Action. Do not establish ABC values for Gulf penaeid shrimp stocks.

Alternative 2: Establish an ABC for each Gulf penaeid shrimp stock that is equal to the OFL for that stock.

Discussion:

Alternative 1 would not set an ABC for each of the penaeid shrimp stocks. Because ABCs are required for managed species, this not a viable alternative. **Alternative 2** would establish an ABC for each stock, consistent with the guidance in the National Standard 1 Guidelines at 50 CFR 600.310(h)(1)(i). This provision recognizes that the Magnuson-Stevens Act does not require annual catch limits (ACL) and accountability measures (AM) for species that have a life cycle of less than 1 year, but notes that status determination criteria (SDC) and biological reference points must be included in the FMP:

> ***Exceptions from ACL and AM requirements*** —(i) *Life cycle.* Section 303(a)(15) of the Magnuson-Stevens Act "shall not apply to a fishery for species that have a life cycle of approximately 1 year unless the Secretary has determined the fishery is subject to overfishing of that species" (Pub. L. 109-479 104(b)(2)). This exception applies to a stock for which the average age of spawners in the population is approximately 1 year or less. While exempt from the ACL and AM requirements, FMPs or FMP amendments for these stocks must have SDC, MSY, OY, ABC, and an ABC control rule.

The ABC is generally specified at a level equal to or less than the OFL to account for scientific uncertainty. The SSC determined that it was appropriate to set the ABC equal to this MSY value or MSY proxy, which is also the OFL, because penaeid shrimp are a highly resilient annual crop with rapid population growth and rebounding ability, making a reduction of the ABC below MSY unnecessary.

As noted in the National Standard 1 Guidelines, the exemption from the ACL and AM requirements only applies if the stock is not subject to overfishing. Therefore, under **Alternative 2**, if a penaeid shrimp stock is determined to be undergoing overfishing, the Council may need to take further action to address the ACL and AM requirements.

CHAPTER 3. LIST OF PREPARERS

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NOAA GC = National Oceanic and Atmospheric Administration General Counsel; SEFSC = Southeast Fisheries Science Center; SERO = Southeast Regional Office of the National Marine Fisheries Service.

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APPENDIX A. OTHER APPLICABLE LAW

The Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) (16 U.S.C. 1801 et seq.) provides the authority for management of stocks included in fishery management plans (FMP) in federal waters of the exclusive economic zone (EEZ). However, management decision-making is also affected by a number of other federal statutes designed to protect the biological and human components of U.S. fisheries, as well as the ecosystems that support those fisheries. Major laws affecting federal fishery management decision-making include the Endangered Species Act (Section 1.4) and E.O. 12866 (Regulatory Planning and Review, Chapter 3). Other applicable laws are summarized below.

Administrative Procedure Act

All federal rulemaking is governed under the provisions of the Administrative Procedure Act (5 U.S.C. Subchapter II), which establishes a "notice and comment" procedure to enable public participation in the rulemaking process. Under the Act, the National Marine Fisheries Service (NMFS) is required to publish notification of proposed rules in the *Federal Register* and to solicit, consider, and respond to public comment on those rules before they are finalized. The Act also establishes a 30-day waiting period from the time a final rule is published until it takes effect. Proposed and final rules will be published before implementing the actions in this amendment.

Coastal Zone Management Act

Section 307(c)(1) of the federal Coastal Zone Management Act of 1972 (CZMA), as amended, requires federal activities that affect any land or water use or natural resource of a state's coastal zone be conducted in a manner consistent, to the maximum extent practicable, with approved state coastal management programs. The requirements for such a consistency determination are set forth in the National Oceanic and Atmospheric Administration (NOAA) regulations at 15 CFR part 930, subpart C. According to these regulations and CZMA Section 307(c)(1), when taking an action that affects any land or water use or natural resource of a state's coastal zone, NMFS is required to provide a consistency determination to the relevant state agency at least 90 days before taking final action.

Upon submission to the Secretary of Commerce, NMFS will determine if this plan amendment is consistent with the Coastal Zone Management programs of the states of Alabama, Florida, Louisiana, Mississippi, and Texas to the maximum extent possible. Their determination will then be submitted to the responsible state agencies under Section 307 of the CZMA administering approved Coastal Zone Management programs for these states.

Data Quality Act

The Data Quality Act (Public Law 106-443) effective October 1, 2002, requires the government to set standards for the quality of scientific information and statistics used and disseminated by federal agencies. Information includes any communication or representation of knowledge such as facts or data, in any medium or form, including textual, numerical, cartographic, narrative, or

audiovisual forms (includes web dissemination, but not hyperlinks to information that others disseminate; does not include clearly stated opinions).

Specifically, the Act directs the Office of Management and Budget to issue government wide guidelines that "provide policy and procedural guidance to federal agencies for ensuring and maximizing the quality, objectivity, utility, and integrity of information disseminated by federal agencies." Such guidelines have been issued, directing all federal agencies to create and disseminate agency-specific standards to: (1 ensure information quality and develop a pre-dissemination review process; (2 establish administrative mechanisms allowing affected persons to seek and obtain correction of information; and (3 report periodically to Office of Management and Budget on the number and nature of complaints received.

Scientific information and data are key components of FMPs and amendments and the use of best available information is the second national standard under the Magnuson-Stevens Act. To be consistent with the Magnuson-Stevens Act, FMPs and amendments must be based on the best information available. They should also properly reference all supporting materials and data, and be reviewed by technically competent individuals. With respect to original data generated for FMPs and amendments, it is important to ensure that the data are collected according to documented procedures or in a manner that reflects standard practices accepted by the relevant scientific and technical communities. Data will also undergo quality control prior to being used by the agency and a pre-dissemination review.

National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966, (Public Law 89-665; 16 U.S.C. 470 *et seq.*) is intended to preserve historical and archaeological sites in the United States of America. Section 106 of the NHPA requires federal agencies to evaluate the impact of all federally funded or permitted projects for sites on listed on, or eligible for listing on, the National Register of Historic Places and aims to minimize damage to such places.

Historical research indicates that over 2,000 ships have sunk on the Federal Outer Continental Shelf between 1625 and 1951; thousands more have sunk closer to shore in state waters during the same period. Only a handful of these have been scientifically excavated by archaeologists for the benefit of generations to come. Further information can be found at: http://www.boem.gov/Environmental-Stewardship/Archaeology/Shipwrecks.aspx

The proposed action does not adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places nor is it expected to cause loss or destruction of significant scientific, cultural, or historical resources. In the Gulf of America (Gulf), the *U.S.S. Hatteras*, located in federal waters off Texas, is listed in the National Register of Historic Places. Fishing activity already occurs in the vicinity of this site, but the proposed action would have no additional adverse impacts on listed historic resources, nor would they alter any regulations intended to protect them.

APPENDIX B. ACTION 2 RATIONALE

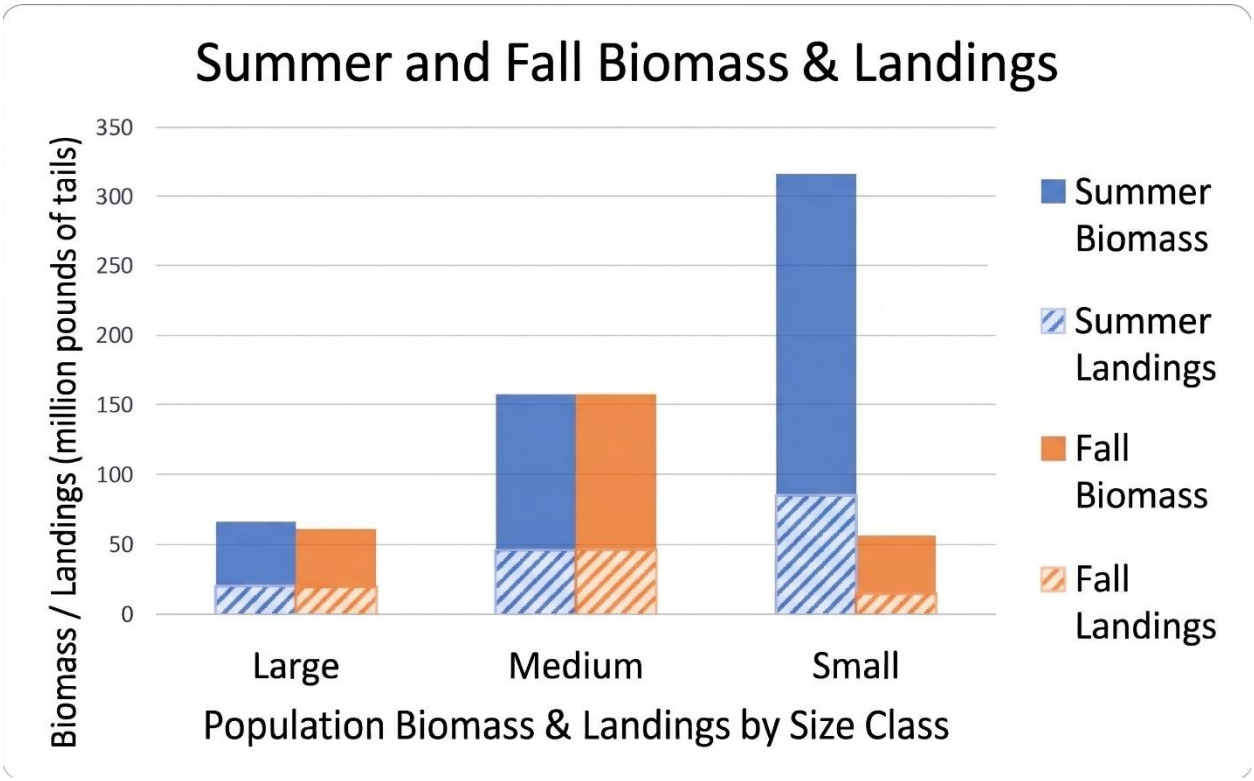
At the October 2026 Shrimp Advisory Panel (AP) meeting, the AP passed a motion *to recommend that the Council adopt Action 2, **Alternative 2** as the preferred alternative, contingent upon the rationale provided in Amendment 20 is clarified sufficiently to support the **Alternative 2**.* This appendix serves as this rationale.

Brown Shrimp Seasonal Empirical Dynamic Model (EDM)

The brown shrimp EDM is a 2-season model because the SEAMAP survey operates in two discrete timesteps throughout the year (summer and fall). Maximum sustainable yield (MSY) is the catch derived from the sum of sustainable seasonal harvest rate (0.265) multiplied by the standing biomass for each size class, in each season. Below is a simplified equation illustrating the calculation for a single year:

$$C = \sum_{i,j} F_i * B_{i,j}$$

where C is equilibrium catch, *i* is season, and *j* is size class. The MSY obtained from the brown shrimp model applies the seasonal fishing mortality rate (F_{season}=0.265) to our best estimates of the population throughout the year (i.e. in the Summer and in the Fall, Appendix B Figure 1). This seasonal rate can be approximated to an annual rate of 0.460 [1-(1-F_{season})^2] (Mayfield, 1975) and was provided to the SSC for comparison purposes. However, MSY should not be derived from the annual rate and must be derived from the seasonal rate. EDM implicitly models processes such as natural mortality between the two seasons making the MSY derived from the seasonal Fs more accurate.



Appendix B Figure 1. Summer and Fall biomass by size class in million pounds of tails (solid) and Summer and Fall landings by size class in million pounds of tails (hashed). The landings are derived from the calculation in the equation above.

MFMT Values in Alternative 1

The MFMT values from **Alternative 1** in Action 2 cannot be translated to equivalent units or directly compared to the fishing mortality rates obtained using EDM (and reported to the SSC) because the underlying model structures and recruitment and mortality mechanics are different. For example, **Alternative 1** for brown shrimp was estimated using an annual Stock Synthesis model, which creates (i.e., recruitment and growth) and kills (i.e., natural and fishing mortality) biomass throughout the year. This resulted in an end of year B_{MSY} estimate (6,098,824 lb of tails) smaller than MSY (146,923,100 lb of tails). Because the MSY represents the cumulative biomass extracted over the whole year, and B_{MSY} represents only the tiny fraction of residual survivors remaining at the end of the annual cycle, mathematically linking this cumulative yield to the small residual standing stock required the model to output extremely high fishing mortality rates that are not comparable to EDM output.