Three-Year Audit – Louisiana Shrimp

Introduction to the tool

The three-year audit template was developed by FishChoice and is based on the FisheryProgress FIP Review Guidelines and feedback from the FisheryProgress Technical Oversight Committee. The audit template is designed to present key information about the current performance of the fishery and to verify reported progress on www.FisheryProgress.org. **FisheryProgress requires the use of three-year audit template.**

Basic FIP information

Target species scientific name and common name	Brown Shrimp *Farfantepenaeus aztecus* White Shrimp *Litopenaeus setiferus*
Fishery location	Federal waters and state waters of Louisiana
Gear type(s)	Otter Trawl, Skimmer Trawl
Catch quantity (weight)	Brown 24,602,363 pounds (2017) White 69,025,403 pounds
Vessel type(s) and size(s)	Trawl vessels – 27 to 75 ft with more than half from 56 to 75 ft long
Number of vessels	Otter trawl 2,576 Skimmer trawl 3,651
Management authority	NOAA/NMFS, GMFMC, LWFC

Stakeholder consultation & meetings

In all cases, the review team consisted of Dr. Robert Trumble, FIP Reviewer, supported by Ms. Laura Deighan, TX-LA FIP Coordinator; and Ms. Nancy Mathews, FL FIP coordinator. The review team met in person at the offices of Cox Wholesale Seafoods (Nancy Mathews) on the 30th and 31st Oct, and jointly made conference calls to the experts who could provide background and material needed to understand the current status of MSC Performance Indicators (PIOs) and the status of progress on the client action plans. In two cases, communications occurred outside the scheduled meeting to accommodate experts not otherwise available: one by telephone on Nov 1 after the closure of the meetings, and one by email over several days following the meeting. The list below provides information for participants on specific communications.

Name	Affiliation	Date and Subjects Discussed
Elizabeth Scott Denton	NOAA, Galveston Lab	Oct 29, 2019. Goals, design, and results of Shrimp observer program
Gary Graham	Consultant; TX Sea Grant, retired	
Laura Picariello	TX Sea Grant; former Audubon GULF	

Name	Affiliation	Date and Subjects Discussed
James Primrose	NOAA	
Frank Helies	NOAA	
Matt Freeman	GMFMC staff	
Michelle Masi	NOAA, Galveston Lab	
Michelle Masi	NOAA, Galveston Lab	Oct 29, 2019. Stock assessment design and results; application of stock assessment into harvest strategy and control rule
Laura Picariello	TX Sea Grant; former Audubon GULF	
Gary Graham	Consultant; TX Sea Grant, retired	
Benny Gallaway	LGL Ecological Research Associates	
Lance Robinson	Texas Parks and Wildlife Department	Oct 29, 2019. Management of state shrimp fisheries (Texas)
Laura Picariello	TX Sea Grant; former Audubon GULF	
Jarrett Barker	Texas Parks and Wildlife Department - Enforcement	Oct 29, 2019. Enforcement of state shrimp fisheries (Texas)
Canh Nguyen	NOAA Gear Monitoring Team	Oct 30, 2019. TED, BRD monitoring
Michael Barnette	NOAA	Oct 30, 2019. ETP species, TED monitoring
Frank Helies	NOAA	Oct 30, 2019. Federal Management of shrimp fisheries (federal waters)
Peyton Cagle	Louisiana Department of Wildlife and Fisheries	Oct 30, 2019. Management and enforcement of state shrimp fisheries (Louisiana)
Julia Lightner	Louisiana Department of Wildlife and Fisheries	
Harry Blanchet	Louisiana Department of Wildlife and Fisheries	
Christian Winslow	Louisiana Department of Wildlife and Fisheries	
Chad Hebert	Louisiana Department of Wildlife and Fisheries - Enforcement	
Laura Picariello	TX Sea Grant; former Audubon GULF	
Benny Gallaway	LGL Ecological Research Associates	Oct 30, 2019. Red snapper fishing effort/sea turtle effort cap; electronic log books.
Gary Graham	Consultant; TX Sea Grant, retired	
Laura Picariello	TX Sea Grant; former Audubon GULF	
Ryan Gandy	Florida Fish and Wildlife Commission	Nov 1, 2019 Management of state shrimp fisheries (Florida)
Leann Bosarge	GMFMC – Voting Member	Nov 1, Nov 4 (by email) Council action on harvest control rule for shrimp

Summary of MSC pre-assessment scoring

Principle	Component	Performance Indicator		Current Score	Rationale and Justification
1	Outcome	1.1.1	Stock status	≥80	The most recent stock assessments for brown and white shrimp (data through 2017 show neither species is overfished nor undergoing overfishing, and both stocks are above the biomass threshold. The 2018 stock assessment for brown shrimp noted that "Spawning biomass and recruitment have fluctuated, decreasing in recent years while fishing mortality (F) increased during the later portion of the time series. This decrease in spawning biomass, recruitment, and increase in F warrant careful consideration because if this pattern of declining stocks and increasing fishing pressure continues at the current rate overfishing may become evident in this fishery in the very near future." White shrimp have decreasing biomass (2014-2017) and higher F (2012-2017) in more recent years than in the several preceding years (2005-2013) for biomass and (2007-2011) for F, but not to the same degree as for brown shrimp. For both species, low fishing effort suggests that the abundance declines result from environmental impacts, rather than from fishing impacts.
		1.1.2	Stock rebuilding	NA	NA
	Management	1.2.1	Harvest Strategy	≥80	The discussion on harvest strategy in the 2016 Louisiana Shrimp pre-assessment still holds at this point. In addition, The GMFMC has implemented shrimp effort maxima to protect red snapper and sea turtles; reaching either of these maxima could result in shrimp effort reductions or fishery closures. Research has determined that natural mortality for juvenile red snapper is ~4 times the original estimate, therefore reducing the effectiveness on the effort cap and allowing a small increase in the effort cap for red snapper (FMP Amendment 18).
		1.2.2	Harvest control rules and tools	60-79	The MSA, Regulations for MSA, and the GMFMC Shrimp FMP have strong requirements for avoiding overfishing, avoiding an overfished state, and for rebuilding stocks as necessary. In all cases, the MSC requires some sort of explicit trigger that requires specific action. The current system has sufficient elements to reach an SG80 harvest

					control rule except that it does not specify “pre-agreed rules and management actions that will be taken in response to changes in indicators of stock status with respect to explicit or implicit reference points” (MSC Standard v2.01). However, the GMFMC has not set a clear HCR to implement the requirements. The warning in the 2018 brown shrimp stock assessment for risk of overfishing in the near future highlights the benefits of an HCR before low stock status becomes an issue needing action. The fishery remains at 60-79. The MSC provides guidance for lightly exploited stocks and data limited stocks useful for exploring options for HCR. See Workplan Results for further discussion.
		1.2.3	Information and monitoring	≥80	The discussion on information and monitoring in the 2016 Louisiana Shrimp pre-assessment still holds at this point. In addition, new information on the natural mortality of juvenile red snapper allows the Council to adjust shrimp effort limits that protect red snapper to levels that minimize impacts on the shrimp fishery while maintaining protection for red snapper (GMFMC Amendment 18).
		1.2.4	Assessment of stock status	≥80	The discussion on stock assessment in the 2016 Louisiana Shrimp pre-assessment still generally holds at this point. Draft stock assessments for brown and white shrimp show similar results to those of the 2018 assessment, with declining biomass for both species. The low fishing effort suggests that the abundance declines result from environmental impacts, rather than from fishing impacts.
2	Primary species	2.1.1	Outcome	Otter Trawl ≥80 Skimmer Trawl 60-79	Otter Trawl. An update of the 2012 catch composition report for the shrimp fishery is due in 2020. Therefore, no new data are available to update the discussion on Primary Species outcome from the 2016 Louisiana shrimp pre-assessment. Skimmer Trawl. No Primary species were identified in the 2012-2014 federal observer data but a substantial proportion of finfish catch was unidentified. The 2016 shrimp FMP identified Gulf menhaden at 8 percent and blue crab at 7 percent of the total from earlier federal observers. Both would be Main species, and both are certified by MSC. The 2016 pre-assessment considered that this indicator is unlikely to achieve an unconditional pass without some knowledge of the species in the

					unidentified category, and this score still stands. The ongoing plans currently being implemented for Louisiana observer coverage should provide necessary information to make appropriate determinations for all gear types in state waters.
		2.1.2	Management strategy	Otter Trawl ≥80 Skimmer Trawl 60-79	Otter Trawl. An update of the 2012 catch composition report for the shrimp fishery is due in 2020. Therefore, no new species composition data are available to update the discussion on Primary Species management from the 2016 Louisiana shrimp pre-assessment. Main species consist of pink and white shrimp in the brown shrimp unit of assessment, pink and brown shrimp in the white shrimp unit of assessment, and red snapper in both units of assessment. None of the main Primary Species experiences overfishing or is in an overfished state. The GMFMC regularly considers measures to minimize unwanted catch of Primary Species. White, brown, and pink shrimp are not unwanted. Finfish and blue crab are unwanted, and TEDs and BRDs actively discharge these species from the nets with limited retention. NOAA Fisheries gear experts continue to work with the shrimp fishing industry to develop new and effective ways to reduce bycatch, and regulations establish permits to test alternate TEDs and BRDs and to test modifications (50 C.F.R. §223.207e; 50 C.F.R. §222.207a). Individual fishermen account for a substantial portion of testing alternate methods. Louisiana does not require BRDs, which may forgo substantial amounts of bycatch savings. Skimmer Trawl. In the absence of Primary species, no management plan is necessary at the SG80 level. If menhaden and blue crab are determined as Main in the future, both are certified and undergo suitable management. However, the absence of species identification for a large portion of the catch precludes a full pass. The ongoing plans currently being implemented for Louisiana observer coverage should provide necessary information to make appropriate determinations for all gear types in state waters.
		2.1.3	Information	Otter	Otter Trawl. On-board observer coverage remains on the

				Trawl 60-79 Skimmer Trawl 60-79	order of 2%, and electronic logbook (ELB) coverage is on the order of 40%. A substantial proportion of the catch composition is not identified. It is not clear that the results of observer coverage represent the activities of the fleet as a whole. Therefore, the discussions from the 2016 pre-assessment generally hold, and the score remains at 60-79. The shrimp trips using otter trawl remain at sea for roughly 30-35 days, suggesting that the cost of fishermen acting differently with observers than without may be too high for an observer effect to occur. Recovery funds from the Deepwater Horizon settlement have added approximately 300 observer days per year in the Gulf of Mexico, a large portion of which is scheduled for the shrimp fishery. Comparison of ELB data with observer data shows comparable results. The Shrimp Roundtable and LGL proposed a research project to gather information on the unidentified portion of the catch. See Workplan Results for further discussion. Skimmer Trawl. Ongoing observer coverage does not occur and the previous coverage left large amounts of finfish unidentified. This leads to continuation of the 60-79 score from the pre-assessment. The ongoing plans currently being implemented for Louisiana observer coverage should provide necessary information to make appropriate determinations of management needs.
	Secondary species	2.2.1	Outcome	Otter Trawl ≥80 Skimmer Trawl 60-79	Otter Trawl. An update of the 2012 catch composition report for the shrimp fishery is due in 2020. Therefore, no new data are available to update the discussion on Secondary Species outcome from the 2016 Louisiana shrimp pre-assessment. Skimmer Trawl. Unidentified fish, Atlantic croaker, and unidentified crustaceans species were identified in the 2016 pre-assessment as Main species. These species require RBF. The Louisiana shrimp FMP identified blue crab and menhaden – both currently MSC certified – as likely primary species, based on 2007 observer data. The pre-assessment identified a number of minor secondary species. The 2016 pre-assessment considered that this indicator is unlikely to achieve an unconditional pass

					without some knowledge of the species in the unidentified category, and this score still stands. The ongoing plans currently being implemented for Louisiana observer coverage should provide necessary information to make appropriate determinations for all gear types in state waters.
		2.2.2	Management strategy	Otter Trawl ≥80 Skimmer Trawl 60-79	Otter Trawl. An update of the 2012 catch composition report for the shrimp fishery is due in 2020. Therefore, no new species composition data are available to update the discussion on Primary Species management from the 2016 Louisiana shrimp pre-assessment. Main species consist of Atlantic croaker and sea trout. Both of these species require RBF, which the 2016 pre-assessment scored as low risk. Numerous other species caught a low proportion of the total catch are considered minor species. The GMFMC regularly considers measures to minimize unwanted catch of Primary Species. TEDs and BRDs actively discharge these species from the nets with limited retention. NOAA Fisheries gear experts continue to work with the shrimp fishing industry to develop new and effective ways to reduce bycatch, and regulations establish permits to test alternate TEDs and BRDs and to test modifications (50 C.F.R. §223.207e; 50 C.F.R. §222.207a). Individual fishermen account for a substantial portion of testing alternate methods. Louisiana does not require BRDs, which may forgo substantial amounts of bycatch savings. Skimmer Trawl. As noted in the 2016 pre-assessment, the Louisiana Shrimp Management Plan does not specify if management of secondary species occurs for state waters. State regulations require TEDs or tow time limits but do not require BRDs; many fishermen voluntarily use them in both otter and skimmer trawls. There is no suggestion that the Louisiana management system has done a review of the potential effectiveness and practicality of alternative measures to minimize UoA-related mortality of unwanted catch of main secondary species for otter trawl or skimmer trawl. However, new federal regulations require TEDs in skimmer trawls for vessels ≥40 ft, and retained tow time

					limits for smaller vessels, demonstrating review of alternate measures. The ongoing plans currently being implemented for Louisiana observer coverage should provide necessary information to make appropriate determinations for all gear types in state waters. The federal regulations requiring TEDs for some skimmer trawl vessels demonstrate review of alternative methods; while not as effective as BRDs for finfish, TEDs do exclude them.
		2.2.3	Information	Otter Trawl 60-79 Skimmer Trawl 60-79	Otter Trawl. On-board observer coverage remains on the order of 2%, and electronic logbook (ELB) coverage is on the order of 40%. A substantial proportion of the catch composition is not identified. It is not clear that the results of observer coverage represent the activities of the fleet as a whole. Therefore, the discussions from the 2016 pre-assessment generally hold, and the score remains at 60-79. The shrimp trips using otter trawl remain at sea for roughly 30-35 days, suggesting that the cost of fishermen acting differently with observers than without may be too high for an observer effect to occur. Recovery funds from the Deepwater Horizon settlement have added approximately 300 observer days per year in the Gulf of Mexico, a large portion of which is scheduled for the shrimp fishery. Comparison of ELB data with observer data shows comparable results. The Shrimp Roundtable and LGL proposed a research project to gather information on the unidentified portion of the catch. See Workplan Results for further discussion. Skimmer Trawl. Ongoing observer coverage does not occur and the previous coverage left large amounts of finfish unidentified. The ongoing plans currently being implemented for Louisiana observer coverage should provide necessary information to make appropriate determinations for all gear types in state waters. This leads to continuation of the 60-79 score from the pre-assessment.
	ETP species	2.3.1	Outcome	Otter Trawl ≥80 Skimmer	Otter Trawl, Skimmer Trawl. The 2014 Southeast US Shrimp Biological Opinion (BiOp) remains the best available information on the status of ETP species potentially affected by the shrimp fishery. The BiOp

				Trawl ≥80	indicates that indicated that the shrimp fishery does not pose jeopardy to sea turtles, smalltooth sawfish, or sturgeon. The 2016 Louisiana shrimp pre-assessment lists the ETP species and summarizes the current status, and no substantive changes have occurred since then. NOAA Fisheries (Mike Barnette, pers. comm.) indicated that smalltooth sawfish may be increasing in abundance.
		2.3.2	Management strategy	Otter Trawl ≥80 Skimmer Trawl ≥80	Otter Trawl. The management strategy is based on requirements of the BiOp, and has increased in effectiveness since publication of the BiOp. The main measures of the management strategy consist of effort limitations on shrimp effort and minimum levels of compliance with TED effectiveness. Outreach to fishermen, monitoring of TEDs, and enforcement have demonstrated that compliance of otter trawls has substantially exceeded requirements. The management is comparable to or better than that described in the 2016 Louisiana pre-assessment. NOAA Fisheries gear experts continue to work with the shrimp fishing industry to develop new and effective ways to reduce bycatch, and regulations establish permits to test alternate TEDs and BRDs and to test modifications (50 C.F.R. §223.207e; 50 C.F.R. §222.207a). Individual fishermen account for a substantial portion of testing alternate methods. Skimmer Trawl. Skimmer trawls had consistently exceeded the tow time limit put in place to protect sea turtles. NOAA Fisheries reached an agreement with Oceana concerning a lawsuit brought by Oceana. The parties reached a settlement that required a new EIS for skimmer trawls and a rule regarding TED requirements for skimmer trawls. NOAA Fisheries proposed in 2016 to withdraw the alternative tow time restriction and require all skimmer trawls, pusher-head trawls, and wing nets rigged for fishing in the Gulf of Mexico and other locations to use TEDs. NOAA Fisheries reported at the end of October that the decision was due soon. LDWF reported that outreach by Louisiana authorities and FIP participants plus enhanced enforcement by LDWF has reduced noncompliance to levels that no longer cause concern. The new federal

					regulations requiring TEDs on some skimmer trawl vessels will likely increase survival of sea turtles.
		2.3.3	Information	≥80	Otter Trawl. On-board observer coverage remains on the order of 2%, and electronic logbook (ELF) coverage is on the order of 40%. A substantial proportion of the catch composition is not identified. It is not clear that the results of observer coverage represent the activities of the fleet as a whole. However, the success of generating a high degree of compliance with TED regulations provides information supporting a conclusion that the fishery does not jeopardize sea turtles, leading to a likely score ≥80. The shrimp trips using otter trawl remain at sea for roughly 30-35 days, suggesting that the cost of fishermen acting differently with observers than without may be too high for an observer effect to occur. Recovery funds from the Deepwater Horizon settlement have added approximately 300 observer days per year in the Gulf of Mexico, a large portion of which is scheduled for the shrimp fishery. Comparison of ELB data with observer data shows comparable results. The Shrimp Roundtable and LGL proposed a research project to gather information on the unidentified portion of the catch. See Workplan Results for further discussion. Skimmer Trawl. The 2019 EIS for skimmer trawls provides the best available information and led to a regulatory decision to require TEDs in skimmer trawls for vessels ≥40 ft and to retain tow time limits for smaller vessels towing skimmer trawls. The limited observer coverage may not represent the fleet as a whole. However, the success of generating a high degree of compliance with TED regulations provides information supporting a conclusion that the fishery does not jeopardize sea turtles, leading to a likely score ≥80. However, given the success of generating a high degree of compliance with TED regulations in otter trawls and reasonably expected success in skimmer trawls provides information supporting a conclusion that the skimmer trawl fishery does not jeopardize sea turtles, leading to a likely score ≥80.

	Habitats	2.4.1	Outcome	Otter Trawl ≥80 Skimmer Trawl ≥80	Otter Trawl. The 2016 EFH review by the GMFMC is the most current discussion of habitat status, and updates the discussion in the 2016 Louisiana shrimp pre-assessment. The situation remains as described in the 2016 Louisiana pre-assessment that the fishery occurs on soft sediments without substantial vertical relief in a highly dynamic area stirred by hurricanes and tropical storms. Neither the GMFMC nor Louisiana has established VME, but the GMFMC has set HAPC and regulations to protect it as necessary. Skimmer Trawl. Louisiana has closed the inshore waters to shrimp trawling, so that the areas that might contain seagrasses are not vulnerable to trawling, and has closed private oyster reefs to trawling. These actions restrict shrimp trawling to areas of low vulnerability.
		2.4.2	Management strategy	Otter Trawl ≥80 Skimmer Trawl ≥80	Bottom Trawl. No substantial changes in habitat management have occurred since the 2016 Louisiana shrimp pre-assessment. The GMFMC has set regulations for bottom trawls to protect habitat and LDWF has set regulations to prohibit nearshore trawling, where seagrass may occur, and trawling on private oyster reefs. EFH regulations require updates at 5-yr intervals, which call for review of fishery impacts, allowing for review of alternate gears or gear modifications.
		2.4.3	Information	Otter Trawl ≥80 Skimmer Trawl ≥80	Otter Trawl, Skimmer Trawl. The 2016 EFH review summarizes key information necessary for management.
	Ecosystem	2.5.1	Outcome	Otter Trawl ≥80 Skimmer Trawl ≥80	Bottom Trawl. The Gulf of Mexico is undergoing serious anthropogenic threats, but there is no suggestion that the shrimp otter trawl fishery is a contributor. The strong condition of brown and white shrimp stocks, the generally good status of the primary, secondary, ETP, and habitat components, (although secondary species would likely receive a condition for substantial amounts of unidentified fish caught by shrimp trawls), the model results indicating that shrimp is not a constraining forage species provide evidence that the shrimp fisheries do not adversely affect the Gulf of Mexico ecosystem.

		2.5.2	Management strategy	Otter Trawl ≥80 Skimmer Trawl ≥80	NOAA Fisheries and the Regional Councils have increased emphasis on ecosystem-based fishery management (EBFM) since the 2016 Louisiana shrimp pre-assessment. NOAA fisheries updated an integrated ecosystem assessment in 2017 and updated a national roadmap to EBFM in 2018, and the GMFMC prepared a white paper on ecosystem approaches to fisheries management in the Gulf of Mexico in 2018. The GoM ecosystem is under increasing stress from human-induced and natural pressures. The shrimp fishery appears as a minor cause of the pressures. While the GMFMC has not developed a Fisheries Ecosystem Plan, it implicitly takes into account ecosystem impacts when establishing shrimp management, such as advancing stock assessments, tracking ecosystem trends, climate change, multi-species interactions, connectivity, habitat conservation, and human dimensions.
		2.5.3	Information	Otter Trawl ≥80 Skimmer Trawl ≥80	Bottom Trawl. Reasonable information exists to understand status for Primary, Secondary, ETP, and Habitat components, although information for the first three would likely receive conditions in a full assessment. Additional information comes from ecosystem status reports, Atlantis ecosystem models, and ecopath with ecosim models. The ecosystem status reports do not address the impacts of shrimp fishing on the ecosystem. An Atlantis model does not fully characterize shrimp fishing, so does not yet provide full insight. Older ecopath with ecosim models predict that reduction in shrimp abundance from shrimp fishing will not affect production or rebuilding of predator species because of the abundance of alternate food sources.
3	Governance and Policy	3.1.1	Legal and customary framework	Federal ≥80 Louisiana ≥80	Federal management of otter trawl vessels with federal permits occurs through the fishing range of the vessels, including state waters. Vessels that fish only in state waters must have state permits and are subject to state management. NOAA Fisheries and LDWF report that the amount of otter and skimmer trawl shrimp catch by state-only licensed vessels is larger than the catch in Federal waters, thus requiring a robust state system. The GMFMC coordinates with state agencies for regulations as

					appropriate, for example the Texas Shrimp Closure in Texas state and federal waters that prohibits otter trawl fishing to protect small shrimp until they reach marketable size. The federal system has a robust legal and customary framework as described in the 2016 shrimp pre-assessment. Harmonization of scores for 3.1.2 with Louisiana blue crabs and oysters would also call for scores ≥80.
		3.1.2	Consultation, roles and responsibilities	Federal ≥80 Louisiana ≥80	The GMFMC, NOAA Fisheries, and LDWF have clearly defined roles and responsibilities and robust consultation requirements as described in the 2016 Louisiana shrimp pre-assessment. Harmonization of scores for 3.1.2 with Louisiana blue crabs and oysters would also call for scores ≥80.
		3.1.3	Long term objectives	Federal ≥80 Louisiana ≥80	The GMFMC, NOAA Fisheries, and LDWF have clear long-term objectives as described in the 2016 Louisiana pre-assessment. Reinterpretation of the requirement for objectives consistent with the precautionary approach leads to a revised conclusion that the Louisiana fishery reaches a full pass. Harmonization of scores for 3.1.3 with Louisiana blue crabs and oysters would also call for scores ≥80.
	Fishery specific management system	3.2.1	Fishery specific objectives	≥80	The federal and state shrimp FMPs lay out fishery-specific objectives, as described by the 2016 Louisiana pre-assessment.
		3.2.2	Decision making processes	Federal - ≥ 80 Louisiana 60-79	The federal system, specifically within the GMFMC, has a strong and clear decision-making process as summarized in the 2016 Louisiana shrimp pre-assessment. Louisiana might use the precautionary approach, but no evidence was presented to demonstrate that this actually happens. The fishery-specific objectives do not explicitly invoke the precautionary approach. There is no way to tell whether decisions that may have had a result consistent with the precautionary approach were made with the precautionary approach or for some other reason. For example, Louisiana does not require use of BRDs, which may forego a substantial amount of bycatch savings; it is not clear how this decision was made.
		3.2.3	Compliance and enforcement	Federal ≥80	State and federal compliance is robust for the Louisiana shrimp fishery, as summarized in the 2016 Louisiana

				Louisiana >80	shrimp pre-assessment for otter trawl fishing. Regular non-compliance reported by the pre-assessment from too-long duration skimmer trawl tows has been rectified through outreach and stepped up state enforcement.
		3.2.4	Management performance evaluation	Federal - ≥ 80 Louisiana - 60-79	The federal system, specifically within the GMFMC, has internal and external performance evaluation, as summarized in the 2016 Louisiana shrimp pre-assessment. Louisiana conducts internal review of the state management system but does not conduct regular external review of performance against objectives that meet requirements of PI 3.2.4 (e.g., GSA 4.10.1).

Workplan results

Result	Related Action on FisheryProgress	Related MSC Performance Indicator	Explanation
No substantive action has taken place. Further planning was postponed pending discussion during 3-year review. Therefore, the reviewer provided extended evaluation and recommendation for further steps.	Develop a well-defined Harvest Control Rule	1.2.2	**MSC Guidance** The "annual crop" nature of brown and white shrimp makes traditional harvest control rules difficult or even unsuitable in practice for these species. HCRs have been developed for shrimp fisheries elsewhere in the world, for example in Australia (e.g., https://fisheries.msc.org/en/fisheries/exmouth-gulf-prawns/@@assessments; https://fisheries.msc.org/en/fisheries/australia-northern-prawn/@@assessments; https://fisheries.msc.org/en/fisheries/spencer-gulf-king-prawn/@@assessments). These other fisheries differ substantially from the GOM fisheries as their control rules open and close fisheries seasonally depending on abundance estimates from commercial or survey catch rates; the GOM shrimp fisheries mostly have seasonal closures not dependent on survey results or fishery performance. Several "Guidance" or "Interpretation" statements by the MSC, which are not directly related to HCR, provide insight that may apply to development of suitable HCR for GOM shrimp. The MSC Interpretation "TRP [target reference point] in annual or nearly annual fisheries (FCR

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			v2.0 - Annex SA PI 1.1.1)" addresses proxies for MSY for use as a TRP. The point is to assure that the stock remains in a productive zone with fishing superimposed on high natural variability. Comment: The proxy for MSY set by the GMFMC and used in the shrimp stock assessment meets this Interpretation. GSA2.5 provides substantial guidance on HCR for different situations. "HCRs are the arrangements by which a fishery expects to achieve the stock status outcomes expressed in PI 1.1.1. They are defined as the pre-agreed rules and management actions that will be taken in response to changes in indicators of stock status with respect to explicit or implicit reference points, and MSC expects these elements to be part of HCRs. The values adopted for such reference points are critical to the performance of the HCR, and CABs should ensure that the interaction between the rules of the HCR and the reference points is part of their assessment." For example: HCRs will usually include some form of dynamic rule, requiring that a change of some sort will be made in response to a fishery indicator moving above or below one of the trigger reference points. In lightly exploited fisheries, it may be that some reference points are set to trigger changes in data collection or assessment approaches, as certain thresholds are reached (see Dowling et al, 2011a). Comment: Though lightly exploited at present, the rapidly declining shrimp biomass suggests that reaching the MSST in the foreseeable future is not a trivial probability. The environment has likely driven the decline, but both NOAA Fisheries and MSC require action when fisheries exceed thresholds. The MSC allows changing threshold levels to recognize natural environmental changes. HCRs are often applied on a frequent basis, such as with the annual setting of TACs or effort restrictions. Such HCRs respond dynamically to the monitoring data from the fishery with regular adjustments to input/output type management measures. In data-poor fisheries which are managed without such input/output controls, management may comprise only technical measures such as size limits, gear restrictions, closed seasons and closed areas. In these cases, the specific terms of the technical measures are usually set and fixed for a relatively long period

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			of time (several years), based on occasional strategic stock assessments, that are shown to deliver defined target and/or limit reference points. Such an arrangement may be regarded as equivalent to a dynamic HCR operating over a longer time scale in cases where some indicators are monitored to confirm that the HCRs are delivering the intended targets for the stock. At the 80 level in scoring issue (a), 'well-defined' HCRs in these cases would be expected to explicitly include the conditions under which the technical measures in the fishery would be expected to be revised in the future. Comment: It is not clear that the 'technical measures' provisions would apply to the shrimp fisheries, as they are not data poor and have reference points. In all cases, the MSC requires some sort of explicit trigger that requires specific action. The current system has sufficient elements to reach an SG80 harvest control rule except that it does not specify "pre-agreed rules and management actions that will be taken in response to changes in indicators of stock status with respect to explicit or implicit reference points" (MSC Standard v2.01). **US Federal Requirements** The National Standard 1 guidelines (§600.310) require that "Any FMP shall establish a mechanism for specifying ACLs in the FMP (including a multiyear plan), implementing regulations, or annual specifications, at a level such that overfishing does not occur in the fishery, including measures to ensure accountability (Magnuson-Stevens Act section 303(a)(15))." Further, each Council must establish an Acceptable Biological Catch control rule that will provide a built-in buffer that accounts for scientific uncertainty between the overfishing limit and the Acceptable Biological Catch levels for each managed stock. These levels are to be set by the Council's Scientific and Statistical Committee using stock assessments or other available biological information, and the Acceptable Biological Catch control rule for determining the appropriate level of risk. … The National Standard 1 guidelines further recount that 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

Result	Related Action on FisheryProgress	Related MSC Performance Indicator	Explanation
			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." In response to the control rule (and other) requirements, the GMFMC passed a Generic Annual Catch Limit/Accountability Measures Amendment (2011) for all management plans. This generic amendment did not specify applicable action for shrimp other than royal red shrimp. Amendment 15 (2015) of the Shrimp FMP gives guidance for taking action in cases of overfishing: "If the MFMT is exceeded for two consecutive years, the appropriate committees and/or panels (e.g. stock assessment panels, advisory panels, SSCs) would convene to review changes in apparent stock size, changes in fishing effort, potential alterations in habitat or other environmental conditions, fishing mortality and other factors that may have contributed to the decline." Amendment 15 also gives guidance for taking action in cases of overfished stocks: "The Shrimp Advisory Panel recommended that values below MSST for two years in a row designate the stock as overfished, as a solitary year below MSST might be indicative of environmental conditions and not necessarily an overfished condition. Unlike for overfishing, the SFA did not have a two-year provision for responding to an overfished determination (GMFMC 1999). In the Magnuson Stevens Act, if a stock is determined to be overfished, NMFS must notify the Council, and the Council must begin developing conservation and management measures to rebuild the stock. The Council is required to implement management measures within two years of being notified. Because of the biology of the shrimp stock, variability in environmental conditions, and the two-year timeframe to implement these measures, the stock may no longer be considered overfished by the time management measures are in effect." Comment: Neither the overfishing nor overfished guidance of Amendment 15 meets the MSC specifications for harvest control rule. It is not clear that Amendment 15 meets the requirements of NS1 requiring FMPs to have ABC control rules. Rather, the GMFMC tasks to the SSC the development of the ABC control rule. Subsequently in 2017, the GMFMC prepared a options paper for

Result	Related Action on FisheryProgress	Related MSC Performance Indicator	Explanation
			reconsidering the harvest control rules of the Generic Annual Catch Limit/Accountability Measures Amendment, as the gap between target and limit reference points seemed too small to offer effective management. Comment: The GMFMC has not taken action to revise the ABC control rule, but is preparing to convene the ABC Control Rule Working Group during 2020. **Recommendation** The FIP participants have an opportunity to interact with the GMFMC and the ABC Control Rule Working Group early in the process and to advocate for development of a robust harvest control rule that not only meets the needs of the GMFMC but of the MSC. Agreement by the GMFMC to meet MSC requirements are likely consistent with Council goals, if the GMFMC agreed on rules with management actions or suites of actions that will be taken in response to changes in indicators of stock status with respect to MFMT and MSST, e.g., specified action taken when biomass falls to or below MSST or fishing mortality reaches or exceeds MFMT.
The Gulf of Mexico Shrimp Supply Chain Roundtable hosted a workshop in Galveston, TX on July 11, 2018 to identify alternative ways to conduct a statistical analysis of observer coverage levels and evaluate data collection for the shrimp fishery. The workshop included those with expertise on the shrimp fishery, certification standards, and the history of the FIP and Supply Chain Roundtable, as well as	Evaluate observer coverage levels	2.1.3, 2.2.3, 2.3.3	**Observer coverage** On-board observer coverage remains on the order of 2%, and electronic logbook (ELB) coverage is on the order of 40%. A substantial proportion of the catch composition is not identified. It is not clear that the results of observer coverage represent the activities of the fleet as a whole. The Gulf of Mexico Shrimp Supply Chain Roundtable hosted a workshop in Galveston, TX on July 11, 2018 to identify alternative ways to conduct a statistical analysis of observer coverage levels and evaluate data collection for the shrimp fishery. The workshop included those with expertise on the shrimp fishery, certification standards, and the history of the FIP and Supply Chain Roundtable, as well as representatives from NOAA. Participants proposed the use of electronic logbook (ELB) data to verify the accuracy of observer program data by comparing catch per unit effort (CPUE); work on this is underway and shows good conformance of ELB with on-board observer results. A report on ELB-Observer comparison is not yet available for review. However, several positive situations have occurred:

Result	Related Action on FisheryProgress	Related MSC Performance Indicator	Explanation

representatives from NOAA. Participants proposed the use of electronic logbook (ELB) data to verify the accuracy of observer program data by comparing catch per unit effort (CPUE); work on this is underway and shows good conformance of ELB with on-board observer results. A report on ELB-Observer comparison is not yet available for review.			• Comparison of ELB data with observer data shows comparable results.
			• The shrimp trips using otter trawl remain at sea for roughly 30-35 days, suggesting that the cost of fishermen acting differently with observers than without may be too high for an observer effect to occur (i.e., likely minimal observer effect).
			• The Gulf of Mexico Shrimp Supply Chain Roundtable and LGL proposed a research project to gather information on the unidentified portion of the catch.
			• Recovery funds from the Deepwater Horizon settlement have added approximately 300 observer days per year in the Gulf of Mexico, some portion of which is scheduled for the shrimp fishery.
			
			Recommendation
			
			Review by the GMFMC SSC and or SEDAR of these and other efforts, with its responsibility to assure best available science for the Council, and advice from the SSC and or SEDAR to the GMFMC could determine if the efforts are sufficient to enhance reliability of the data. If so, this PI would likely reach theSG80.
			
			It would help if the GMFMC/SSC set goals and objectives for shrimp fishery observer coverage to relay to NOAA Fisheries. Two basic questions are relevant to the determination:
			
			1. What needs to be estimated from the data? For example:
			  • Landed catch
			  • Discarded catch
			  • Rare events (ETP)
			  • Biological Information
			  • Distribution
			2. What resolution (e.g., time and space) is needed? For example:
			  • Fishery wide
			  • Fleet/sectors
			  • Season/area
			  • Individual vessel
			  • Stock

Result	Related Action on FisheryProgress	Related MSC Performance Indicator	Explanation
	Evaluate observer data collection	2.1.3, 2.2.3	FIP participants developed a proposal for fishing vessels to retain and bring to shore subsamples of catch for full identification. If the research demonstrates feasibility for applying this identification of the currently unidentified portion of the catch to the entire fleet, then it could fill the gap of a large amount of unidentified catch. The proposal has not yet received funding, and the FIP participants are actively applying for funds. NOAA Fisheries personnel confirmed that the agency could use privately-developed research or data from privately-run observer programs, if previously agreed with the agency. NOAA Fisheries has a policy of treating certification participants as normal stakeholders and not conducting activities specifically to benefit certification programs. Therefore, it is not certain that NOAA Fisheries, and therefore the GMFMC, would provide resources aimed to produce the improvements sought by this FIP. It would benefit the FIP participants to understand current NOAA Fisheries and GMFMC priorities and to present to both the benefits that accrue from the improvements such that NOAA Fisheries and the GMFMC could justify support for the FIP in terms of current priorities.
Confirm compliance with TED requirements	Gear tuning	2.3.3	Outreach by FIP participants, NOAA Fisheries gear monitoring program, and enforcement activities has combined to result in TED compliance substantially exceeding the minimum levels necessary to protect sea turtles. TED compliance no longer seems to cause jeopardy to sea turtles.
LDWF is currently working on an updated bycatch study protocol to place observers on vessels for multi-day trips, which will allow for more vessels to participate. Results are still anticipated in 2020.	Develop a state-level bycatch data collection and management strategy.	2.1.1, 2.1.2, 2.1.3, 2.2.1, 2.2.2, 2.2.3	LDWF has begun a state-waters on-board observer program for shrimp trawls that would provide data for species composition of shrimp catch. This will form the basis for analysis of bycatch on these species and should lead to management as required by the impacts identified by analyses. Because the results are not available, the scores have not changed from those of the pre-assessment.
Outreach to skimmer fishermen and requirement for removing net from water between tows	Increase tow time and TED compliance in skimmer trawls.	2.3.1, 2.3.2, 2.3.3, 3.2.3	Outreach to skimmer fishermen and requirement for removing net from water between tows has increased compliance to the point that LDWF considers no compliance problem currently exists. NOAA Fisheries has finalized a rule requiring TEDs on skimmer trawl vessels $\geq$40 and retained tow time limits on smaller vessels.

Result	Related Action on FisheryProgress	Related MSC Performance Indicator	Explanation
has increased compliance to the point that LDWF considers no compliance problem currently exists. NOAA Fisheries has proposed a rule requiring TEDs on skimmer trawls, and a decision is due at any time.			
At the federal level, the GMFMC voted to add information from the 2019 EFH update to FMPs. At the state level, FIP participants continue to monitor and advocate for NOAA Fisheries and GMFMC progress on EBFM and habitats.	Compile additional habitat information from state and federal agencies.	2.4.2	Most Gulf of Mexico estuaries/lagoons/bayous can be apportioned into three habitat types: seagrasses, soft (mud/sand) bottom, and oyster reef. Oyster reef is the sole source of vertical relief in most estuaries and, with seagrasses and mashes, the primary bastion resisting erosion. Seagrass habitat is considered as a main habitat type in this assessment and it is negatively affected natural and anthropogenic impacts such as nutrient loading, dredging activities for shipping, and coastal development/shore protection structures. Because of its ecosystem importance, there are dedicated seagrass conservation programs in place which include regular monitoring of seagrass distribution, characterization, and trends (e.g. USGS 2007; TOC 2013). In Louisiana, seagrass habitat only exists around the Chandleleur Islands, and is protected by prohibition of shrimp trawling in inshore waters.
FIP participants continue to monitor and advocate for NOAA Fisheries and GMFMC progress on EBFM. The EBFM program has brought substantial information in the management system used for decisions. FIP participant consultation with LDWF personnel is underway to provide state-specific information.	Compile additional ecosystem information currently available from state and federal agencies.	2.5.1, 2.5.2, 2.5.3	NOAA Fisheries has implemented a program for developing ecosystem-based fishery management. Since the LA pre-assessment, the program has brought substantial information into the fishery management system, which uses the information in management decisions. The GMFMC has not developed a Fishery Ecosystem Plan; however, the information is sufficient to conclude that shrimp trawling does not inflict long-term adverse impacts on the ecosystem. FIP participant consultation with LDWF personnel is underway to provide state-specific information.

Result	Related Action on FisheryProgress	Related MSC Performance Indicator	Explanation
Harmonization with other Louisiana MSC certified fisheries will demonstrate that the LA component of the shrimp fishery will meet theSG80 requirements.	Evaluate Louisiana fishery standards for consistency with use of precautionary approach.	3.1.1	The MSC assessments and harmonization among the assessment teams for Louisiana Blue Crab and for Prestige Oyster determined that Louisiana met the requirement for consistency with the Precautionary Approach. As this Performance Indicator considers the overall governance and policy, this determination should also apply to the Louisiana shrimp fishery.

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