St. Bernard Parish Government
Coastal Division

2019 Mississippi River Flood Fishery Disaster Spending Proposal for Southeast Louisiana

October 2019

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I. Executive Summary

The United States experienced more precipitation between April 2018 and May 2019 than during any previous 12-month period on record (Donegan, 2019). Consequently, the volume of water being absorbed by the Mississippi River, which drains 1.25 million square miles of land (40% of all drainage in the United States) across 31 states and two Canadian provinces, was unprecedented in 2019 (National Aeronautics and Space Administration, 2019). The *2019 Mississippi River Flood* surpassed the *Great Flood of 1927* in many locations and the river was in flood stage from January 5, 2019 through July 27, 2019 (Donegan, 2019). As a result of this historic flood event, the Bonnet Carre' Spillway was opened for an unprecedented two times in one calendar year and remained open for a record number of days (United States Army Corps of Engineers, 2019).

In February 2019, Louisiana Governor John Bel Edwards declared an emergency in anticipation of the Mississippi River flood event. Four months later, Governor Edwards and the entire Louisiana congressional delegation requested that the United States Secretary of Commerce declare a *federal fishery disaster* as a result of the Bonnet Carre' Spillway's devastating impacts on local fisheries. The Secretary of Commerce officially declared the federal fishery disaster on September 25, 2019. **The purpose of the *2019 Mississippi River Flood Fishery Disaster Spending Proposal for Southeast Louisiana* is to outline a number of short- and long-term interventions that would facilitate the recovery and sustainability of the commercial fishing, recreational fishing, and related industries in the Pontchartrain Basin.**

The proposal includes a summary of the 2019 Mississippi River Flood event and its impacts on local fisheries, as determined by the Louisiana Department of Wildlife and Fisheries (LDWF). Additionally, a number of interventions have been outlined and organized into two distinct categories:

1. Emergency relief and short-term recovery ($67,518,000); and
2. Long-term recovery, mitigation, and sustainability ($34,147,000).

The total sum requested for the proposed interventions is $101,665,000.

Short-term interventions include the provision of direct financial compensation to impacted businesses and individuals, as well as the emergency construction of fishery-related infrastructure throughout the region. Long-term interventions outlined in the report include habitat restoration and research, both of which are intended to mitigate the risks associated with future spillway openings and sustain local fisheries going forward.

II. 2019 Mississippi River Flood and Fishery Disaster

The flood control infrastructure along the Mississippi River in southeast Louisiana ultimately functioned as designed during the 2019 Mississippi River Flood event, and no significant flooding occurred in the region. However, there were significant adverse environmental impacts associated with the two openings of the Bonnet Carre' Spillway. The drastic influx of freshwater from the spillway into brackish and saline estuaries severely impacted fish and wildlife by disrupting their life cycles and causing harmful algae blooms.

In southeast Louisiana, the impacts of the Bonnet Carre' Spillway have been particularly devastating to the *eastern oyster*, an immobile shellfish that is dependent upon ideal salinity. Other commercially significant fisheries that have been impacted include shrimp, crabs, and finfish. Finally, the *bottlenose dolphin*, which is particularly sensitive to prolonged exposure to freshwater, has been the subject of an *unusual mortality event* since the initial 2019 opening of the Bonnet Carre' Spillway (National Oceanic and Atmospheric Administration, 2019).

The below estimates are based on data collected by LDWF from March 2019 through May 2019 and have been compared to the six-year average (2012-2018) for the specified months.

Eastern Oyster
Change (%) in Statewide Dockside Value (-13.9%)
Change ($) in Statewide Dockside Value (-$2.8 million)
Estimated Change ($) in Dockside Value in Pontchartrain Basin (-$1.12 million)

LDWF has estimated the dockside value of oysters lost due to direct mortality following the influx of freshwater to be approximately $2.8 million. The total estimated loss in dockside value represents a 13.9% reduction in the average dockside value of landings during the specified months. LDWF has estimated that the Pontchartrain Basin generates 40% of annual oyster landings value.

The Louisiana Department of Health (LDH) also closed some of the most productive oyster harvest areas in the state due to low salinity, poor water quality, and associated health concerns. LDWF expected that oyster mortality would increase throughout the summer months due to a combination of freshwater and rising water temperatures. It is likely that the oyster fishery in southeast Louisiana will take up to three years to recover from the event.

Shrimp
Change (%) in Statewide Dockside Value (-33.9%)
Change ($) in Statewide Dockside Value (-$8.5 million)
Estimated Change ($) in Dockside Value in Pontchartrain Basin (-$680,000)

LDWF has estimated the dockside value of shrimp (brown and white only) lost due to direct mortality following the influx of freshwater to be approximately $8.5 million. The total estimated loss in dockside value represents an approximately 33.9% reduction in the average dockside value of landings during the specified months. LDWF has estimated that the Pontchartrain Basin generates 8% of annual shrimp landings value.

Blue Crab
Change (%) in Statewide Dockside Value (-21.1%)
Change ($) in Statewide Dockside Value (-$2.7 million)
Estimated Change ($) in Dockside Value in Pontchartrain Basin (-$1.08 million)

LDWF has estimated the dockside value of crab lost due to direct mortality following the influx of freshwater to be approximately $2.7 million. The total estimated loss in dockside value represents an approximately 21.1% reduction in the average dockside value of landings during the specified months. LDWF has estimated that the Pontchartrain Basin generates 40.3% of annual crab landings value.

Recreational Fishing

Although the commercial finfish industry in southeast Louisiana is relatively small compared to other coastal regions, recreational fishing is a critical component of the local economy. According to LDWF, the popular *spotted seatrout*, which prefers to spawn in high salinity waters, began being displaced from the Pontchartrain Basin in May 2019 and experienced an observed decrease in population beginning in June 2019. LDWF has estimated a 50% below average catch per unit effort for the spotted seatrout in the Pontchartrain Basin through September 2019.

The opening of the Bonnet Carre' Spillway has adversely impacted all recreational licensees throughout the region. Please refer to the below regional recreational license data summary from 2017.

Table II.1: Summary of Recreational Licenses by Parish, 2017 (Source: LDWF)

	Total Licenses	Basic Fish/Salt	Crb/Shr/Oys
Jefferson	63,281	51,449	1,125
Orleans	25,691	20,101	319
St. Bernard	7,999	6,771	129
St. Charles	11,884	9,907	288
St. Tammany	49,349	38,928	1,073
Tangipahoa	21,402	17,049	410
TOTAL:	**179,606**	**144,205**	**3,344**

Charter Fishing

Like recreational fishing, the charter fishing industry is a critical component of the local economy. The opening of the Bonnet Carre' Spillway has adversely impacted all charter captains throughout the region. Please refer to the below regional charter fishing license data summary from 2017.

Table II.2: Summary of Charter Fishing Licenses by Parish, 2017 (Source: LDWF)

	Charter 6	Charter 6+
Jefferson	202	3
Orleans	34	0
St. Bernard	24	0
St. Charles	20	1
St. Tammany	81	0
Tangipahoa	11	0
TOTAL:	**372**	**4**

Bottlenose Dolphin

A total of 310 dolphins were stranded (deceased or distressed) in the Northern Gulf of Mexico between February 1, 2019 and September 1, 2019 (National Oceanic and Atmospheric Administration, 2019). St. Bernard Parish Government identified 44 of the strandings in local waterways between April 2019 and June 2019. According to the National Oceanic and Atmospheric Administration (NOAA), the standings represent a 300% increase above the annual average, constituting an *unusual mortality event* (NOAA, 2019).

Table II.3: Dolphin Strandings by Month and State, 2019 (Source: NOAA)

2019	FL Pan.	AL	MS	LA
February	11	9	8	12
March	15	5	14	19
April	11	11	27	31
May	0	4	56	31
June	0	6	18	4
July	0	4	4	1
August	0	3	3	3
Total:	**37**	**42**	**130**	**101**

III. Emergency Relief and Short-Term Recovery

The economic and environmental impacts described above have created a crisis for the commercial fishing, recreational fishing, and related industries in southeast Louisiana. Consequently, it is critical that immediate emergency relief be provided to those businesses and individuals that have been affected. Furthermore, although the Bonnet Carre' Spillway has been closed, additional emergency measures must be taken in order to improve fishery-related infrastructure and restore hydrology, salinity levels, and water quality throughout the region.

Table III.1: Proposed Emergency Relief and Short-Term Recovery Interventions

Title	Typology	Estimated Cost
Fishery Disaster Emergency Relief Program Phase 1	Direct Assistance	$27,018,000.00
Mississippi River Gulf Outlet Hydrologic Restoration	Fishery-Related Infrastructure	$500,000.00
Mardi Gras Pass Closure	Fishery-Related Infrastructure	$40,000,000.00
	TOTAL:	**$67,518,000.00**

Fishery Disaster Emergency Relief Program Phase 1
Direct Assistance
Budget: $27,018,000

The purpose of the *Fishery Disaster Emergency Relief Program* (FDERP) Phase 1 is to provide immediate financial relief to commercial fishing, recreational fishing, and related industries that were economically damaged during the Bonnet Carre' Spillway openings.

$24,518,000 (Commercial Component)
$ 500,000 (Recreational Component)
$ 1,000,000 (Charter Component)
$ 1,000,000 (Related Industries Component)

The commercial component was calculated using recent changes in the value of dockside landings (see Section II) and projected losses through March 2020. Conservative lump sum budget figures have been included for the recreational, charter, and related industries components. It is suggested that the FDERP be designed and administered in a manner similar to the claims-based relief program that was implemented following the *Deepwater Horizon* explosion and oil spill.

Eastern Oyster
Budget: $16,000,000

An estimated $1,120,000 in dockside value has already been lost in the Pontchartrain Basin since the Bonnet Carre' Spillway opening. Due to the opening of the spillway, recent LDH closures, increasing water temperatures during the summer months, and the lengthy recovery process for oysters, it is reasonable to project that the overall

decrease in dockside value in the Pontchartrain Basin through March 2020 may exceed 50% of the annual average. According to LDWF, the average statewide dockside value of oysters is $80 million/year and 40% of all dockside value ($32 million/year) is generated in the Pontchartrain Basin. It is suggested that 50% of this figure be made available to commercial oystermen in southeast Louisiana.

Shrimp
Budget: $3,559,500

An estimated $680,000 in dockside value has already been lost in the Pontchartrain Basin since the Bonnet Carre' Spillway opening. According to LDWF, the average statewide dockside value of shrimp is $132 million/year and 8% of all dockside value ($10.5 million/year) is generated in the Pontchartrain Basin. It is suggested that 33.9% of this figure be made available to commercial shrimpers in southeast Louisiana.

Blue Crab
Budget: $4,958,500

An estimated $1,080,000 in dockside value has already been lost in the Pontchartrain Basin since the Bonnet Carre' Spillway opening. According to LDWF, the average statewide dockside value of crab is $54.5 million/year and 40.3% of all dockside value ($23.5 million/year) is generated in the Pontchartrain Basin. It is suggested that 21.1% of this figure be made available to commercial crabbers in southeast Louisiana.

Mississippi River Gulf Outlet Hydrologic Restoration
Fishery-Related Infrastructure
Budget: $500,000

Congress de-authorized the Mississippi River Gulf Outlet (MRGO) in 2006 and the USACE immediately began evaluating options for permanently closing the channel. After studying several alternatives, the USACE ultimately decided to close the MRGO to deep-draft and shallow-draft vessels by blocking the channel with a rock dam structure near Bayou La Loutre (USACE, 2007). The rock dam structure was constructed in 2012 and has since adversely impacted hydrology, salinity, and water quality in adjacent waterways. Additionally, when the Bonnet Carre' Spillway is open, the rock dam prevents freshwater from passing through the MRGO into the Chandeleur Sound, thereby intensifying and prolonging the negative impacts of low salinity and poor water quality between the dam and spillway. It is suggested that the rock dam be slightly modified for the purpose of restoring area hydrology, maintaining salinity levels, and improving water quality.

Mardi Grass Pass Closure
Fishery-Related Infrastructure
Budget: $40,000,000

Mardi Gras Pass (MGP) began forming in 2011 approximately 35 miles downriver from New Orleans when the Mississippi River overcame the failed Bohemia Spillway water

control structure and breached the adjacent natural levee. A new channel between the Mississippi River subsequently formed and by 2013, the river was discharging into adjacent waterways at up to 3,840 cubic feet/second (CFS) (Lake Pontchartrain Basin Foundation, 2013). According to the Bohemia Spillway and MGP *Hydrocoast* program monitors, the river was discharging into local waterways at a rate of approximately 45,000 CFS as of June 2019, indicating a dramatic increase in the size and flow capacity of MGP over the past several years (Lake Pontchartrain Basin Foundation, 2019). Consequently, the influence of the Mississippi River at MGP has drastically reduced salinity in local waterways and devastated oyster productivity in once prolific harvest areas such as Black Bay.

Historically, the Bonnet Carre' Spillway has been opened rather infrequently. Prior to 2008, the spillway had only been opened eight (8) times (1937, 1945, 1950, 1973, 1975, 1979, 1983, and 1997) (USACE, 2019). The Bonnet Carre' Spillway has since been opened five (5) times, including an unprecedented two (2) openings in 2019 (USACE, 2019). According to the US Global Change Research Program's (2018) *Fourth National Climate Assessment*, "the severity of compound events—the coupling of surge, discharge from rivers, and heavy precipitation—has increased…" and "warmer air temperatures have increased the probability of heavy precipitation events…" (329) It is therefore reasonable to assume that more frequent and intense Mississippi River flood events and Bonnet Carre' Spillway openings will occur in the future.

The Bonnet Carre' Spillway reduces flood risk for millions of people across hundreds of squares miles in southeast Louisiana. Undoubtedly, the spillway will continue being utilized in order to protect life and property throughout the region. However, MGP: 1) has no value as a risk reduction measure; 2) adversely impacts once productive oyster harvest areas; and 3) prevents oyster fishermen from utilizing alternate harvest areas that are a comfortable distance from the influence of the Bonnet Carre' Spillway. It is suggested that MGP be closed immediately in order to reduce the influence of the Mississippi River on the west side of the Pontchartrain Basin, thereby providing an alternate harvest area for oyster fishermen who will otherwise be directly impacted by future Bonnet Carre' Spillway openings.

IV. Long-Term Recovery, Mitigation, and Sustainability

The aforementioned emergency relief and short-term recovery interventions are intended to immediately restore the basic economic functionality of fisheries in southeast Louisiana. However, it is important that stakeholders ensure a successful long-term recovery from the current event while also planning to cope with future events. Investing in interventions that mitigate the impacts of future Bonnet Carre' Spillway openings will ultimately reduce the costs associated with subsequent recovery activities and foster the sustainability of commercial fishing, recreational fishing, and related industries for decades to come.

Table IV.1: Proposed Long-Term Recovery, Mitigation, and Sustainability Interventions

Title	Typology	Estimated Cost
FDERP Phase 2 (2020-2022 Oyster Fund)	Direct Assistance	$25,500,000.00
Southeast Louisiana Oyster Cultch Program	Habitat Restoration	$7,647,000.00
Southeast Louisiana Sustainable Fisheries Study	Research	$1,000,000.00
	TOTAL:	**$34,147,000.00**

FDERP Phase 2 (2020-2022 Oyster Fund)
Direct Assistance
Budget: $25,500,000

The purpose of the proposed FDERP Phase 1 (see pages 6 and 7) is to provide immediate financial relief to commercial fishing, recreational fishing, and related industries that were economically damaged during the Bonnet Carre' Spillway openings. The commercial component was calculated using recent changes in the value of dockside landings and projected losses through March 2020. However, it is anticipated that the oyster fishery in southeast Louisiana will likely take up to three years to recover.

FDERP Phase 2 (2020-2022 Oyster Fund) would be a claims-based relief program intended to address economic damages to the oyster fishery that occur after March 2020. According to LDWF, the average statewide dockside value of oysters is $80 million/year and 40% of all dockside value ($32 million/year) is generated in the Pontchartrain Basin. It is suggested that 25% of this figure ($8,000,000) be made available to commercial oystermen in southeast Louisiana each year from 2020-2022. A conservative lump sum figure ($500,000/year) has also been included to address economic damages sustained by related industries during the same time period.

Southeast Louisiana Oyster Cultch Program
Habitat Restoration
Budget: $7,647,000

In 2013, the Louisiana Trustee Implementation Group (LA TIG) selected the *Louisiana Oyster Cultch Project* as a Phase I Natural Resource Damage Assessment (NRDA) Early Restoration effort to compensate for the damages sustained by the oyster fishery during the Deepwater Horizon event. Six cultch placement sites were selected and once the installations were completed, LDWF monitored oyster recruitment and production in restored areas in order to assess performance against specific criteria. The project fostered an increase in oyster production across all test sites, proving the effectiveness of the intervention. Dredge sampling conducted in July 2014 and October 2014 confirmed the settlement of spat onto cultch material and high rates of survival. As of July 2014, the average area-weighted density of seed-sized oysters across all project sites had also exceeded the prescribed 20/square meter standard. (Deepwater Horizon NRDA Trustees, 2014)

The Louisiana Oyster Cultch Project is a model for oyster habitat and production recovery in southeast Louisiana. The long-term recovery and sustainability of the oyster fishery following the 2019 Mississippi River Flood will require a similar effort, although at a much larger scale. The proposed *Southeast Louisiana Oyster Cultch Program* (SELA-OCP) includes a strategy not only for recovering oyster habitat and production in those areas directly impacted by the recent flood event, but also aims to mitigate the impacts of future Bonnet Carre' Spillway openings by creating new oyster habitat and production opportunities on the west side of the Pontchartrain Basin at Black Bay. It is worth noting that proposed mitigation efforts at Black Bay are contingent upon the closure of MGP (see pages 7 and 8).

While the costs associated with oyster seed grounds restoration varies depending on the location, materials, and methods employed, SBPG used the previous Louisiana Oyster Cultch Project installation at Drum Bay (Biloxi Marsh) to develop preliminary cost estimates for SELA-OCP. The original Louisiana Oyster Cultch Project included a budget of $1,019,783.84 to place approximately 18,000 cubic yards of limestone (91.6 cubic yards/acre) on 200 acres of water bottom at the Drum Bay site, amounting to approximately $5,098/acre.

SBPG recently consulted with local commercial oyster fishermen regarding the benefits of the previous Drum Bay oyster cultch installation. The fishermen offered two critical recommendations: (1) the quantity of limestone per acre should be reduced in order to increase the overall acreage of future installations; and (2) any future installations should be accompanied by no less than a five-year prohibition on users removing the material for bedding purposes. The reduction in quantity of limestone per acre is supported by best industry practices on private oyster leases. With respect to the suggested five-year prohibition on bedding, both LDWF and the Lake Pontchartrain Basin Foundation have found that the cultch material installed during the previous Drum Bay effort was rapidly depleted after it was made available to the public (Hopkins & Lopez, 2016; LDWF, 2016; De Santiago & Lopez, 2018).

As a result of the input received from local commercial oyster fishermen, SBPG has incorporated two significant modifications to the proposed SELA-OCP: (1) the quantity of limestone per acre should be reduced by 50% from 91.6 cubic yards to 45.8 cubic yards, thereby reducing the cost per acre to $2,549; and (2) upon completion, LDWF should impose no less than a five-year prohibition on using the newly-installed material for bedding purposes. Additionally, it is recommended that licensed commercial oyster fishermen from the region be utilized to the extent practical and feasible for the purpose of identifying specific plant locations within each proposed area, as well as sourcing, transporting, and installing the cultch material for the life of the program.

The following public seed ground sites have been included in the proposed SELA-OCP:

Three Mile Bay (500 Acres)
Budget: $1,274,500

Karako Bay (500 Acres)
Budget: $1,274,500

Drum Bay (500 Acres)
Budget: $1,274,500

Morgan Harbor (500 Acres)
Budget: $1,274,500

Black Bay (1,000 Acres)
Budget: $2,549,000

Southeast Louisiana Sustainable Fisheries Study
Research
Budget: $1,000,000

The Water Resources Development Act (WRDA) of 2018 includes a provision that required the USACE to evaluate the manner in which the Old River Control Structure is operated in Louisiana. Similarly, the manner in which the Bonnet Carre' Spillway and Morganza Floodway are operated has become outdated and does not accurately reflect current and projected environmental conditions throughout the Mississippi River Basin.

It is proposed that an additional study be conducted as a supplement to the ongoing USACE Old River Control Structure study. The proposed study would address a number of related water management and fisheries issues in southeast Louisiana and should include a suite of recommended best practices and interventions regarding the following specific challenges in southeast Louisiana:

- Water management throughout the Mississippi River Basin in the United States and Canada;

- Operational management of the Bonnet Carre' Spillway and Morganza Floodway;

- Ongoing and future impacts of natural and planned freshwater diversions from the Mississippi River into southeastern Louisiana waterways; and

- Long-term sustainability of the eastern oyster, blue crab, brown and white shrimp, commercially and recreationally significant finfish, and bottlenose dolphin.

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