No. 142, Original

In The
Supreme Court of the United States

STATE OF FLORIDA,

Plaintiff,

v.

STATE OF GEORGIA,

Defendant.

GEORGIA'S OBJECTIONS TO WRITTEN DIRECT TESTIMONY OF MARK BERRIGAN

CRAIG S. PRIMIS, P.C.
Counsel of Record
K. WINN ALLEN
DEVORA W. ALLON
KIRKLAND & ELLIS LLP
655 15th Street, NW
Washington, DC 20005
Tel.: (202) 879-5000
craig.primis@kirkland.com

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Pursuant to the Case Management Order 20, the State of Georgia hereby serves objections to the admission of the following portions of the Direct Testimony of Mark Berrigan.

Portion of Testimony	**Basis of Objection**
¶ 5: "As I describe in my testimony below, the clearest evidence that harvesting was not to blame for depleting oyster populations is that in 2012, oysters were not removed from the bars, but rather remained dead on the reefs, with the reef substrate intact and silted over. These conditions point to natural mortality, from predation, disease, and stress associated with prolonged high salinity conditions, and not commercial harvesting."	Foundation; Speculation
¶ 5: "While harvesting pressure may have existed on Cat Point Bar and East Hole Bar, I conclude this pressure was not a cause of the fishery failure, but rather the result."	Foundation; Speculation
¶ 7: "The more recent decrease in fresh water inflows, however, created unfavorable environmental conditions that lead to extensive mortalities among oyster populations throughout the Bay. The oyster resources in the Bay will only recover if and when adequate river flows are restored.	Foundation; Speculation
¶ 27: "However, when I assessed the same bars two years later, most oyster populations were severely depleted.	Foundation

Portion of Testimony	Basis of Objection
¶ 29: "I observed depletion of oysters progressing northward along St. Vincent Bar and into the northern part of western Apalachicola Bay, including Little Gully and North Spur Bars, and into St. Vincent Sound."	Foundation
¶ 32: "Reports from oystermen during the first week of the 2012/13 Winter Harvesting Season confirmed the assessments and predicted production estimates. Many called to advise DACS that oyster standing stocks would not be adequate to support commercial harvesting through the winter."	Foundation; Hearsay
¶ 33: "Indeed it was evident from divers' observations that many reefs in Apalachicola Bay were showing the negative effects of decreased rainfall and freshwater flow rates from the Apalachicola River, including depressed recruitment and increased natural oyster mortality due to the predation, disease and stress associated with a higher salinity regimes."	Hearsay; Foundation
¶ 41: The beginning and progression of the extensive oyster population depletion in Apalachicola Bay provided ample evidence that this mortality event was directly associated with high salinity and the lack of freshwater inflow. From direct water testing"	Foundation; Speculation

Portion of Testimony	Basis of Objection
¶ 43: Reports from oystermen suggested that drills were more abundant than at any time in recent memory. It was observed that drill populations were moving farther into the estuary as oyster populations in the more marine portions of the Bay were depleted. The increased abundance of snail predators was obvious, as high numbers of drills were found wherever viable oyster populations were observed, and depletion occurred rapidly after those snails appeared.	Foundation; Hearsay
¶ 45: Additionally, divers noted abundant stone crabs, Menippe mercenaria, on the primary oyster reefs in Apalachicola Bay. Stone crab burrows were easy to recognize and the appetite of these destructive predators was obvious. Stone crab burrows were surrounded by living and dead oysters; the result of crabs actively foraging and bringing live oysters to their burrows. The shells of devoured oysters were also present and formed a ring around burrows.	Foundation; Hearsay
¶ Examining dead oyster shell provided confirmation of the crushing action of stone crabs on the shell of oysters. Stone crabs are considered primary predators of oysters when salinities remain high for extended periods and crab populations become established on oyster reefs.	Foundation

Portion of Testimony	Basis of Objection
¶ 48: In addition to predation, the manner of the depletion event points to salinity as the cause. My observations and analyses of oyster reefs in Apalachicola Bay in 2012 identified a progression of reef depletion from locations farthest from the Apalachicola River moving towards the ever diminishing freshwater source. Surveys of subtidal and intertidal reefs in September and October 2012 confirmed the extent of depletion in western Apalachicola Bay and St. Vincent Sound, as well as providing evidence of increased, but less pronounced, mortality on reefs nearer the river. The depletion continued to progress, with oyster reefs at the mouth of the Apalachicola River eventually showing depletions of 80 to 90 percent.	Foundation; Speculation
¶ 50: The oyster fishery failure in 2012 was the most extensive mortality that I have observed, other than under catastrophic conditions following Hurricane Elena, and has been by far the most prolonged in duration. As discussed above, the failure was primarily the result of mortality associated with high salinity in the Bay. In my judgement, and based upon the available evidence, harvesting intensity and practices can be discounted as a significant cause of the fishery failure.	Foundation

Portion of Testimony	Basis of Objection
¶ 51: The clearest evidence that harvesting was not to blame for depleting oyster populations is that oysters were not removed from the bars, but rather remained dead on the reefs, with the reef substrate intact and silted over. These conditions point to natural mortality, from predation, disease, and stress associated with prolonged high salinity conditions, and not commercial harvesting. When oysters are harvested, living oysters are removed from the reef, and the surface of the reef has a different appearance than either a normal, unharvested reef, or a reef suffering significant mortality.	Foundation
¶ 52: Harvesting was discounted on the reefs observed in western portions of the Bay, based on the presence and abundance of dead shell. In these cases, the reef substrate was intact, but oysters were dead and a silt overburden was apparent. Based on my observations, the depletion events observed in western Apalachicola Bay and St. Vincent Sound were clearly not the result of over-harvesting.	Foundation
¶ 52: "Observations of subtidal reefs in 2012 clearly demonstrated the difference between reefs where dead shell was present and reefs where live oysters had been removed."	Foundation; Hearsay

Portion of Testimony	Basis of Objection
¶ 53: My observations during the winter of 2012 provide additional support for this conclusion. Extreme depletion, where mortality approached nearly 100 percent, was observed on many reefs in the western portions of the Bay, where harvesting for commercial purposes had ceased months before the observations were made. I observed similar depletion on unharvested shellfish leases in the vicinity of natural reefs in September and October of 2012. Predators on those leases, areas with no public commercial harvesting activity at all, had devastated the oyster population.	Foundation
¶ 54: In my opinion, it would be incorrect to blame the overall depletion event in Apalachicola Bay on harvesting, when clearly harvesting had little to do with the onset of 16 depletion that occurred on public reefs and private shellfish leases in the western portions of the Bay system.	Foundation; Speculation
¶ 56: Oyster assessments indicated marked declines in oyster standing stocks on Cat Point and East Hole Bars and predicted that oyster production on these reefs would not support increased harvesting effort. The depletion event was completed on Cat Point and East Hole Bars as harvesting targeted the remaining surviving oysters. Harvesting the surviving oysters from these two reefs was the result or climax of the depletion event, not the cause or the origin. As a consequence of extensive depletion throughout the Bay and the lack of alternative reefs for harvesting, concentrated harvesting on Cat Point Bar and East Hole was inevitable.	Foundation; Speculation

Portion of Testimony	Basis of Objection
¶ 57: Just as harvesting intensity cannot be blamed for the collapse of the oyster fishery, neither can poor harvesting practices. For instance, the harvesting of sublegal oyster stocks did not lead to the population depletion I observed in 2012. The 3-inch size limit for oysters is a regulatory restriction enforced to maintain a market standard, and there is no substantial biological significance to harvesting undersize oysters. It should be noted, that harvesting sublegal sized oysters is not an uncommon practice by oyster fishers. This practice has been a concern in the fishery for decades, and surveys conducted by myself in the mid-1980s, indicated that harvesting sub-legal sized oysters was common practice at that time. Although the practice is regulated and illegal. During thirty years of observations and analyses, no significant impact on population dynamics, reproductive potential, or resource sustainability could be attributed to taking sublegal oysters. The establishment of a 3-inch size limit is somewhat arbitrary and was not set to maintain or increase reproductive potential, but rather is the size supposedly preferred in the marketplace. Based on my observations, the fishery failure throughout the Bay did not result from the harvesting of undersized oysters.	Foundation; Speculation
¶ 57: "The 3-inch size limit for oysters is a regulatory restriction enforced to maintain a market standard, and there is no substantial biological significance to harvesting undersize oysters."	Foundation

Portion of Testimony	Basis of Objection
¶ 57: "The establishment of a 3-inch size limit is somewhat arbitrary and was not set to maintain or increase reproductive potential, but rather is the size supposedly preferred in the marketplace."	Foundation
¶ 58: Harvesting sublegal size oysters on Cat Point Bar may have had an impact on landings and values; but it is highly unlikely that the practice contributed substantially to the depletion of the oyster population. It is clear that harvesting sublegal size oysters from other reefs in western Apalachicola Bay and St. Vincent Sound did not contribute to the depletion event. Harvesting was discontinued as the depletion event proceeded. Simply put, harvesting of sublegal oysters did not present a biological or reproductive challenge that resulted in the collapse of the oyster fishery in Apalachicola Bay in 2012.	Foundation; Speculation
¶ 59: Similarly, the collapse of the oyster fishery in Apalachicola Bay in 2012 was not as a result of harvesters taking unculled oysters and dead shell off the reefs when harvesting. This practice is commonly called "tonging trash." Observations suggest that this practice is uncommon, and only practiced by a small group of unskilled oystermen. This type of harvesting results in a vastly degraded product, and is meant to deceive the processor and consumer. The concern with this harvesting practice in that the oystermen are "hauling off the bay."	Foundation; Speculation

Portion of Testimony	Basis of Objection
¶ 60: "Observations suggest that this practice is uncommon, and only practiced by a small group of unskilled oystermen."	Hearsay
¶ 60: Concerns about this practice are commonly expressed and have been repeated for decades. It is highly unlikely from a physical, labor and volumetric perspective, however, that this practice results in significant damage to reef structure. The removal of cultch by tonging would amount to perhaps 10 to 20 bags per trip. At this rate, the few tongers who engage in this practice could remove about one or two cubic yards. By comparison, restoration efforts to mitigate reef damage deposit thousands of cubic yards. In my opinion, we can discount the notion that a few tongers could "haul away the Bay," or contribute substantially to the depletion of oyster populations leading to the depletion of oyster resources in Apalachicola Bay in 2012.	Foundation; Speculation
¶ 62: Where conditions are favorable, shelling or substrate restoration can dramatically increase oyster productivity. Where high salinity conditions persist, however, no amount of shelling or substrate restoration will bring oysters back.	Foundation; Speculation

Portion of Testimony	Basis of Objection
¶ 63: Faced with unfavorable environmental conditions, like prolonged high salinity, it would be incorrect to assume that any management practice would have been effective in slowing the progression of the depletion event, or accelerating resource recovery. Increased freshwater input and increased river discharge rates are the only factors that will bring the depletion event to an end and allow the resource to recover. Restoration and recovery will be ineffective until the high salinity conditions in the bay are ameliorated.	Foundation; Speculation
¶ 64: The depletion of oyster stocks in Apalachicola Bay resulted from prolonged high salinity conditions associated with the lack of freshwater due to low river discharges from the Apalachicola River. This situation was exacerbated by an overall decline in nutrients provided by the river; extensive predation from animals with marine affinities that thrived in the high salinity conditions, and environmental stress. While these conditions persisted, the functionality of oyster populations and oyster reefs was severely impaired, progressing to a point of mass depletion. The circumstances surrounding the fishery failure in 2011 through 2012 were clearly associated with a combination of factors related to prolonged high salinity and predation. Harvesting pressure was a consequence of the depletion, not a cause.	Foundation; Speculation

Portion of Testimony	Basis of Objection
¶ 65. This pressure only made an impact when standing stocks were severely reduced in isolated locations. Under circumstances that prevailed in the Bay from 2011 through 2012, there were no resource management decisions or actions that could have circumvented the end result and the eventual consequences. In my opinion, it would be incorrect to assume that any management practice would have been effective in slowing the depletion event. Increased freshwater input and increased river discharge rates are the only factors that will bring the depletion event to an end and allow the resource to recover. Restoration and recovery will be ineffective until the high salinity conditions in the bay are ameliorated. The Apalachicola Bay oyster population has for years demonstrated its ability to thrive in varied and natural environmental conditions. Even in the wake of devastating hurricanes, flooding and droughts, including Hurricane Elena in 1985; Hurricane Opal in 1995; Hurricane Earl in 1998; tropical storm Alberto and tropical storm Beryl in 1994; freshwater flooding in 1993, 1994, and 1996, and droughts in 1988-89, 2001-2002, 2008, the oyster fishery always recovered. The difference with the fishery failure in 2012 was the lack of freshwater inflows from the Apalachicola River. Until those flows are restored, the oyster fishery cannot recover.	Foundation; Speculation