Fish Kill Cleanup Services
SCOPE OF SERVICES
Attachment A

Mission:
To assist the County in a coordinated emergency response to a fish kill event in the Brevard County Indian River Lagoon Estuary System, Atlantic Ocean Beachfront and/or St John's River.

Background:
Primary Threat (Red and Brown Tide or Blue Green HAB)
Algal blooms are naturally occurring aquatic phenomenon of a higher than normal concentration of single-celled microorganisms – protozoans or algae. Harmful algal blooms (HAB) such as red tide can produce toxic or harmful effects to people, fish, shellfish, marine mammals and reptiles, and birds. Not all blooms are HAB, but nontoxic blooms can be harmful to seagrasses and at the end of a bloom, low dissolved oxygen levels can cause fish mortality events. Climate change is increasing the temperatures of Florida water systems which may increase the frequency and intensity of future harmful algal blooms.1

Secondary Threat (Cold Snap Event)
Small localized fish kills are common. Larger fish kills over many miles are less common, but can be caused by unusually excessive cold water temperatures. In the winter of 2010 and 2012, Brevard County saw daily minimum temperatures plunge to freezing or near-freezing levels during a cold snap of unusual strength and duration. Cold water fish kills occur throughout much of Florida's Panhandle.

Threat Areas:
Ocean and Beachfront
One particular red tide (*Karenia sp*.) produces brevetoxins which are odorless and tasteless compounds. These compounds are released when waves break and rupture the cells. This toxin can kill marine animals, leading to carcasses washing up on shore. The nutrients from decaying animals wash back into the ocean and feed red tide, possibly worsening the impact of the algal bloom.
Brown tide algal blooms are usually not toxic. However, they block out sunlight and decrease dissolved oxygen concentrations in the water at night and as bloom concentrations crash. Decreased dissolved oxygen levels cause fish to migrate out of the area, or die. This may result in large quantities of animal carcasses washing up on shore.

Indian River Lagoon
Red tide thrives in environments with high salinity. The Indian River Lagoon's brackish environment is not ideal for red tide blooms. However, red tide can accumulate in inlets, which

1 U.S. Global Change Research Program, "Fourth National Climate Assessment" accessed November 29, 2018. https://nca2018.globalchange.gov/chapter/9/

may result in a localized fish kill. Brown tide algal blooms and other dense algal or bacterial

blooms prevent sunlight from reaching seagrass, especially in deeper areas of the lagoon, causing the seagrass to die. Seagrass is an important source of food and protection for various marine species, keeping them hidden from predators. Seagrass is also a major food source for many invertebrates, fish, and manatees. Blooms and decomposing seagrass decrease dissolved oxygen concentrations in the water during respiration at night and as bloom concentrations crash. Decreased dissolved oxygen levels cause fish to migrate out of the area or die.

St John's River
Generally speaking, red tide and brown tide require a salinity around 25-40 practical salinity units to live and survive. Although it is unlikely that red and brown tide will occur in a river, freshwater blue-green algae can create harmful blooms, release toxins, cause a decrease in dissolved oxygen levels, and make the water uninhabitable for marine life.

Goals:
Goal 1: Protection of human health, lagoon water quality, and/or ocean shorelines

Goal 2: Provide safe clearance and disposal of decomposing fish species, potentially on shore and/or surface waters

Goal 3: Provide relevant field data to aid in quantifying impacts of the algal bloom or cold stunning event

A. K.B.B. shall coordinate cleanup efforts and recruit volunteers, commercial fisherman, and other agencies throughout Brevard County to assist with cleanup efforts. K.B.B. will:

   (1) Identify groups, individuals, volunteers that will be able to help search and harvest fish carcasses,

   (2) Coordinate transportation of dead fish to dumpster sites as appropriate and timely,

   (3) Identify and purchase appropriate P.P.E. (personal protection equipment) necessary for specific daily operations,

   (4) Distribute supplies where needed,

   (5) Assist with distribution of licenses to participants in the clean-up, as required,

   (6) Coordinate weekend and holiday coverage, if appropriate,

   (7) Keep good records of total wet weights of fish carcasses to compare to dumpster weights at the landfill and report these numbers to the COUNTY daily,

   (8) Create instructional signage labeled "DEAD FISH ONLY" to display on dumpsters at disposal locations,

(9) Use and pay local commercial fisherman the rate specified below in paragraph D for services, following payment from the COUNTY,

(10) Coordinate dumpster pick up frequency with Waste Management and the landfill, capturing dumpster weights reported by the landfill, and reporting issues,

(11) Mobilize within 24 hours of the authorization call from COUNTY,

(12) If it is sea turtle nesting season (March 1- Oct 13), a permit will be obtained with the appropriate Marine Turtle Permit Holder for beach areas needing to be cleaned,

(13) Provide reports (daily and final) to the COUNTY to include the weight of fish carcasses harvested, the types of fish involved, and any issues encountered, and

(14) Ensure removal of dumpsters and debris from collection points at the end of the fish kill cleanup.

B. The COUNTY shall:

(1) Be the special licenses holder through F.W.C. for personnel assisting with harvesting of dead fish unless regulations are waived by F.W.C.,

(2) Determine dumpster placement and coordinate with Solid Waste,

(3) Determine site location and degree of effort of harvesting based on aerial support for imaging and off-shore situational awareness,

(4) Determine stand down days and demobilization depending on safety concerns, weather effecting the movement of dead carcasses, etc. and

(5) Receive a declaration of state of emergency via executive order from the office of the Governor, if necessary.

C. The COUNTY shall:

(1) Pay to K.B.B. the contract amount of $30.00 per hour rate (12-hour days) per paid KBB staff member involved in a cleanup effort (estimated 20 KBB staff members). This rate includes staff labor, standard equipment, tools, and operating supplies such as:

(i) Vehicles,

(ii) Tools: Rakes/Scoops/Grabbers/Buckets/Nets,

(iii) Weight scales for river fish kills,

(iv) Trash bags,

(v) Personal protection equipment: gloves/respirators/masks/shirts/towels,

(vi) Cleaning supplies and hand sanitizer

(vii) Any and all other supplies and equipment as needed to perform the contracted task.

(2) Maximum Daily Rate not to exceed $7,500 based on a 12-hour day.

D. The COUNTY shall reimburse K.B.B. as follows:

(1) Actual costs to contract fisherman (listed in the special activity license) at current bait fish market rate (approximately 35 cents per pound) of wet fish,

(2) Actual costs per day for contract fisherman equipment and fuel expenses, as determined by COUNTY, and

(3) Actual costs per day for dumpster tipping fees, as determined by the COUNTY.