

Construction and Testing of an Electronic Avian Deterrent Device (E.A.D.D.) for Catfish Farms Impacted by Flooding

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COE/Program: coastal resilience center/ U.S. department of homeland security

Natural disasters such as wildfires, earthquakes, flooding, and extreme weather are on the rise worldwide. Flooding has become a major problem for Mississippians in the past few years, especially for the Mississippi catfish farmer. Mississippi is the nation's largest catfish producer, producing 60% of the catfish on the market today. The Mississippi Delta was hit hard with around 200,000 acres impacted by flooding in June of 2019. Farmland and catfish farms were underwater destroying vital crop production of corn, soybean, and cotton as well as catfish operations. Although the flood waters have receded, new problems have emerged making recovery from the flooding disaster more difficult for catfish farmers. A new aquatic habitat produced by flooding attracted more avian pests to the Mississippi Delta region, that now have made Mississippi catfish farms a regular food stop along their yearly migration. This increase in avian pest activity has left catfish farmers and their crops vulnerable causing a huge financial burden to farmers and the catfish industry as a whole. As a result catfish farmers have had to increase the use of butane cannons, bangers, poppers, and other deterrents to maintain fish production. To help reduce this burden, we have built an electronic avian deterrent device (E.A.D.D.), that would be a more long-term and sustainable solution to the avian pest problems harming catfish farmers recovering from the recent flooding disaster. Here, we detail the construction and field testing of our E.A.D.D. prototype at a catfish farm in the Mississippi Delta. We created over 21 unique bird deterrent sounds and tested their efficiency in deterring wading birds such as Egrets and Herons away from catfish ponds. We used the most efficient deterrents in our E.A.D.D. and examined changes in bird activity at the catfish farm site over a 26 day survey period. Overall, we found that the use of our E.A.D.D. significantly reduced the number of avian pests inhabiting the catfish farm, and was more effective than the current deterrent methods. The E.A.D.D. significantly reduced the number of avian pests from over 900 birds down to less than 200 birds. This data validates further study into the unique spectral properties of the sounds that deterred birds most efficiently. With further research and development, we suggest that our prototype E.A.D.D. could ideally be use to create a non-lethal bird deterrent useful for reducing catfish predication from wading birds on catfish farms and ultimately improve crop yields for catfish farmers impacted by flood related avian pests.