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Figure 1. (Photo credit: (left) USDA Wildlife Services NWRC; (right) Google Earth)

Catfish aquaculture is an important agricultural commodity in Mississippi with most of the production. occurring in the Delta region of the state. A vital factor in managing these farms is reducing fish loss from bird depredation. The most notable bird species that consume catfish are Double-crested Cormorants. These migratory waterbirds arrive in fall and remain in the region throughout winter. Cormorant interactions with catfish aquaculture have previously been studied, but recent changes in the industry warrant collection of new data to understand the dynamic between catfish aquaculture and cormorants.

The Southern Regional Aquaculture Center recently funded a study to estimate the impact of cormorants on the catfish industry. Cormorant depredation can vary across months and years, individual farms, and production

techniques, all of which are influenced by various environmental and human factors. The following information is based on research conducted in the Mississippi Delta over winters (October – April) 2016-2018 by Mississippi State University and USDA National Wildlife Research Center.

Occurrence

- Cormorants arrive in the Delta in early October and remain until mid-April. Cormorant numbers in the Delta peak in early January with as many as 40,535 observed during a single survey.
- Cormorants use flooded cypress and tupelo trees to roost across the entire Delta. The birds tend to use roosts that are farther away from catfish aquaculture in early winter (October – January), however they shift to roosts with more aquaculture surrounding them beginning in February.
- Throughout the 2017-2018 and 2018-2019 winters, we estimated 4.2 and 5 million cormorant foraging days in the Delta during the respective winters.

Figure 2. Photo credit: (left) Terrel Christie, Mississippi State University; (right) Lanna Durst, USDA Wildlife Services NWRC

Diet

- Cormorants are efficient fish-eating birds that will eat about one pound of fish per day. In the Delta, commercially produced catfish make up an average of 33% of a cormorant's diet, with shad being the other predominant food source.
- The amount of catfish consumed can vary considerably depending on the time of year and the roost site of the bird. In March, we observed approximately 70% of a cormorant's diet derived from catfish, while in November only 20% of their diet was catfish. Cormorants that roost closer to catfish aquaculture sites tend to eat more catfish than birds that roost further away from aquaculture facilities.
- Cormorants eat channel and hybrid catfish in similar proportions. The average size of catfish that a cormorant will consume is approximately 8 inches.

Figure 3. Photo credit: Lanna Durst, USDA Wildlife Services NWRC.

Bioenergetics

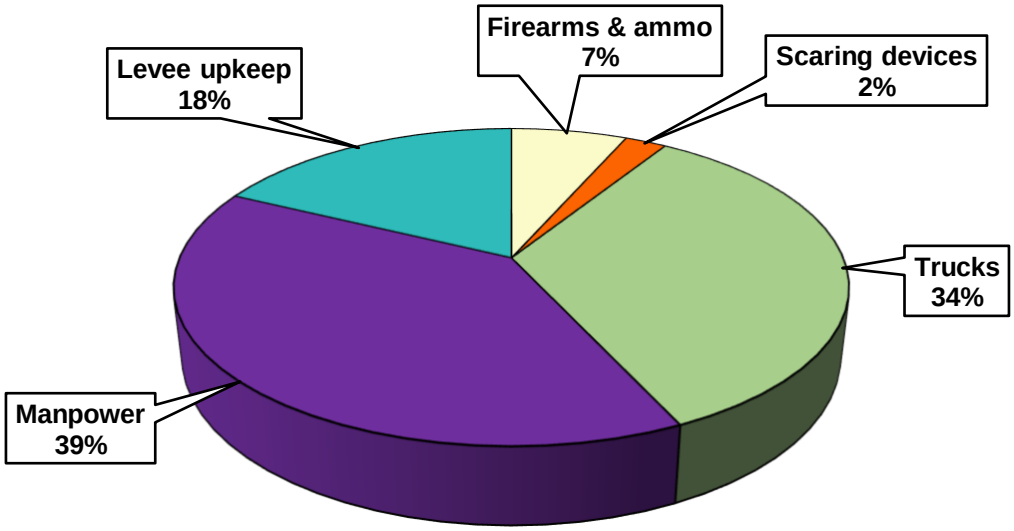
- During winters 2016-2017 and 2017-2018 we estimated that cormorants consumed 1.2 and 1.6 million pounds of catfish, respectively. This translated into an estimated 10.3 and 12 million catfish eaten during the respective winters. Cormorants consumed more catfish in February and March than any other period in both winters.
- Depredation impacts of 40.4 lb/acre in the current study are nearly double those reported in 1995 of 21.3 lb/acre. This increased loss estimate is due to several factors including better loss estimation methods and potentially greater catfish consumption per acre.

Economic Effects

Fish-eating birds result in additional costs on farms as catfish farmers attempt to scare birds off their ponds. In spite of efforts to scare birds, cormorants still consume farmed fish that result in additional negative economic effects associated with reduced farm revenue. Losses to birds in the absence of management would be substantially greater.

- Catfish farmers surveyed reported a per-acre cost to scare birds of $285 ± $159/acre.
- The greatest components of bird-scaring costs were manpower (39%) and truck expenses (34%) (Figure 1).
- The annualized industry-wide value of lost catfish sales revenue to cormorants averaged $47.2 million, ranging from $25.8 million to $65.4 million, depending upon predation levels in any given year.
- The combined total of negative direct economic effects of the annualized costs of scaring birds and the value of fish lost to cormorants averaged $64.7 million.
- Including multiplier effects, the effect on total economic output averaged $70.8 million and on economic value added $85.0 million annually.

Figure 1. Components of costs of scaring birds from catfish ponds



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