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Economics of Cormorant Predation on Catfish Farms

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The Double-crested Cormorant is the primary avian predator on catfish farms causing significant economic losses primarily due to 1) on-farm expenditures related to bird-management activities and 2) value of the catfish lost to cormorants. This comprehensive economic study quantified these two economic effects by surveying catfish farms in the delta regions of Mississippi and Arkansas. On-farm expenditures for bird scaring were used to quantify bird-management costs. Economic losses from fish consumed by cormorants were quantified by evaluating data from field studies of the abundance, distribution, and diet of cormorants in the Mississippi delta.

This study found that catfish farmers spent an average of $285 per acre on farms to scare birds, making bird-scaring costs one of the top five expenditures of raising catfish. Expenses for manpower (labor/manager) were the greatest cost, followed by vehicle expenses (fuel/depreciation/repairs/maintenance) used to run birds, and cost of levee upkeep to chase birds **(Figure 1)**. Many of these costs were fixed in that effort was needed regardless of the volume of catfish produced. Increased fixed costs disproportionally harm small catfish farms because of their limited scale of production.

Estimation of the average annual value of catfish losses industrywide to cormorant predation amounted to $47 million **(Table 1)**, most of which occurred on foodfish farms. Hybrid catfish fingerling losses were seven times higher than channel catfish fingerlings primarily because of the increased value of hybrid fingerlings and greater consumption by cormorants. Historical estimates of the economic effect from cormorant predation were also found to increase substantially over time **(Figure 2)**. Total direct economic effects (bird-scaring costs and the value of fish lost to cormorants despite bird-scaring activities) averaged $65 million **(Table 1)**. This study also found the economic effect of bird predation to influence the profitability of catfish farms. Removing the economic effects surrounding predation losses due to cormorants would improve the profitability of catfish production operations by 4-23% across various farm size and production strategies **(Figure 3)**.

Although recognized as an agriculture sector under the National Aquaculture Act 1980, aquaculture does not receive the same attention as several of the larger livestock industries. Catfish losses to avian predators are not compensated under the federal Livestock Indemnity Protection (LIP), nor under the Emergency Assistance for Livestock, Honeybees, and Farm-raised Fish Program (ELAP). Federal efforts to protect natural resources, such as cormorants, have increased cormorant populations with the subsequent effect of increased losses on aquaculture farms without compensatory relief programs.

Editor's Note. This article is a summary of results of a recently published scientific article Engle et al. (2020): Engle, C.R., T. Christie, B. Dorr, G. Kumar, B. Davis, L. Roy, and A. Kelly. 2020. Principal economic effects of cormorant predation on catfish farms. Journal of the World Aquaculture Society. https://doi.org/10.1111/jwas.12728

Table 1. *Industrywide total direct economic effects of bird predation on catfish farms. Source: Engle et al. 2020.*

Life stages	Bird-scaring costs	Value of fish losses	Total direct economic effects
Fingerlings	$2,393,742	$641,629	$3,035,371
Channels	$797,914	$81,189	$879,103
Hybrids	$1,595,828	$560,440	$2,156,268
Foodsize	$15,080,297	$46,582,632	$61,662,929
Total	$17,474,039	$47,224,261	$64,698,300

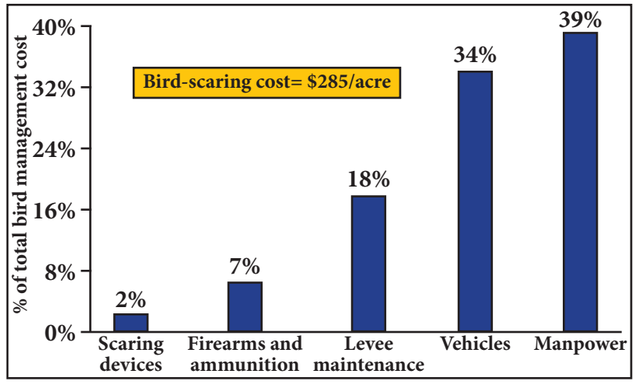

Figure 1. *Components of bird management cost on MS delta catfish farms, 2018. SOURCE: Engle et al. 2020.*

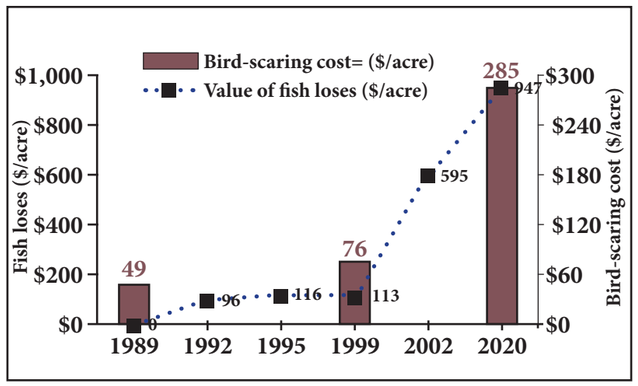

Figure 2. *Historical estimates of negative economic effects from fish-eating birds on catfish farms. SOURCE: Engle et al. 2020.*

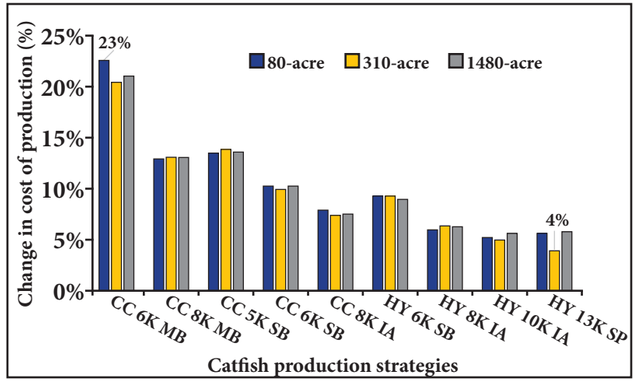

Figure 3. *Percentage change in cost of production without the economic effect associated with birds. (CC=channel catfish; HY=hybrid catfish; MB=multiple-batch system; SB=single-batch system; IA=intensively aerated ponds; SP=split-pond system; Numbers represent fingerling stocking densities in thousands/acre). SOURCE: Engle et al. 2020.*

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