

Fine Scale Characteristics of Catfish Aquaculture Ponds Influencing Use by Double-Crested Cormorants (*Phalacrocorax auritus*) in Northwest Mississippi

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ABSTRACT: Double-crested Cormorants (*Phalacrocorax auritus*) are the main source of depredation at catfish aquaculture facilities in Northwest Mississippi, resulting in significant economic loss. Understanding factors related to pond selection by cormorants could aid in mitigation practices to minimize further loss. We constructed occupancy models to estimate the probability of cormorant presence on catfish ponds against multiple variables associated with each ponds physical surroundings and internal conditions. We also explored cormorant use of aquaculture and natural habitat by using logistic regression to model the proportion of cormorants on aquaculture compared to natural habitat and influences of seasonal variation. Cormorant presence data was collected by aerial survey (n=35) from October to April, of 2015-2017, accounting for an average of 973 catfish ponds and 26 natural water bodies each year. Our results indicate ponds located farther away from trees and activity centers, such as farm workshops, have a higher probability of cormorant use. Larger ponds, and ponds nearer the edge of pond clusters also have an increased probability of use. Specific pond contents influenced cormorant use, including fish species cultured, pond systems, and fish types. From October through January cormorants were distributed more on natural habitat. However, cormorants' proportional use of aquaculture steadily increased beginning in February. This temporal shift from natural habitat toward aquaculture coincides with cormorant spring migration, indicating an increase in foraging of catfish in preparation for the migration north.

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