

Temporal variation in pond use and breeding success for ducks in French fishpond regions: on possible consequences of a decline in fish farming



Fish farming abandonment or extensification may theoretically lead to contrasting consequences for waterfowl breeding in fishpond complexes. We investigated the variation of four indices of duck density or breeding success in pond samples of three main French fishpond areas: Dombes, Forez and Brenne, along with recent changes in fish farming management. In Forez, where fish stocking has been frequently interrupted or fish biomass in ponds has substantially decreased during the two last decades, duck pair density strongly increased in the same time interval, but Mallard *Anas platyrhynchos* brood size decreased. In Brenne, no fish farming abandonment was observed but pond fertilization with organic manure or mineral nitrogen became less frequently implemented during the 2000s. The duck brood: pair ratio decreased meanwhile, indicating either a lower nesting success or higher losses before or immediately after hatching. In Dombes, lower fish stock densities since the 1990s did not reverse a negative trend in duck populations which started in the early 1980s. Our results suggest that fish biomass density in fishponds might be a limiting factor for breeding waterfowl, but a decrease in the nutrient level, for example with lower fertilizer inputs, may negatively affect duck

reproductive success.

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