

# BIRDS OF A FEATHER HELP TOGETHER

Exploring the Methods, Influences and Benefits of Cooperative Breeding in Corvids

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## BACKGROUND



Corvids, which include birds like crows and magpies, are social creatures with complex breeding systems and social behaviours [1,2].



One breeding system that they use is called cooperative breeding where one or more birds known as helpers assist a brooding pair with their offspring [3].



Helpers tend to be related to the brooding pair, and are often juvenile offspring that have delayed their dispersal to participate in helping behaviours [1,4,5]. Helping can include food provisioning or nest/territory defence [5].

Therefore, this behaviour has the potential to increase survivability or fitness of nestlings, helpers, and/or parents.

## SOME METHODS USED TO STUDY IT

Observational Data [3,4,5,6,7,9,10]

Tagging with coloured bands and other markers [4,7,9,10]

Measurements of the body [4,7,6,9]

Experimental sampling [5,6,9]



Data Analysis

## INFLUENCERS & THEIR EFFECTS

Birds are complex and variable, making it difficult to determine all the factors influencing helping behaviour [1,2]. However, their ecology in terms of the environment and the interactions improving nestling success can contribute to this behaviour's presence in specific corvid populations [3,4,5,6,7,8,9,10].

Ecological aspects that can influence cooperative breeding and their impacts:



**Environmental Factors**

- Natural environment and weather [1,2,4,9].
  - Bad weather can reduce mating chances for juvenile birds and impact nestling health [4]. This can drive juveniles to focus their energy towards the brood of successful pairs (including their relatives) by providing additional food to the nestlings [4].
- Social environment [5].
  - The rearing environment of nestlings can affect helping behaviour [5]. When the nestlings of corvids that do not typically cooperatively breed are raised in nests with birds that participate in this behaviour, these transplanted birds tend to exhibit helping behaviour once they become juveniles [5].



**Factors affecting nestling success**

- Predation [7,10].
  - Predator presence can drive this behaviour [7,10]. By protecting nests, helpers can prevent nest failure due to predation and increase the number of nestlings that survive to adulthood [7,10].
- Brood parasites [3].
  - Brooding parasites like cuckoos lay their eggs in the nests of others [3]. This can lead to the death of host nestlings, thereby negatively impacting corvid nests [3]. To deter and inhibit the ability of brood parasites from laying eggs in corvid nests, helpers can participate in cooperative breeding, thereby increasing nestling success [3].
- Microscopic parasites and nestling immunity [6,8].
  - Microscopic parasites can harm nestling health and immunity [6,8]. This can impact corvid behaviour as birds that participate in cooperative breeding can increase nestling health via parasite removal or by indirectly limiting the ability of parasites to spread [6,8].



## BENEFITS OF COOPERATIVE BREEDING

Nest raiding by predators is a leading cause of nest failure in many corvids [7]. Therefore, cooperative breeding can deter predators from preying on nestlings [7]. Helpers can also prevent parasitism by laying eggs in these nests [3] or by getting rid of parasitic microorganisms [6] to aid in immunity [8].

HELPERS PRESENT = NEST SAFE



PREDATORS

PARASITES

In turn, helpers may obtain benefits by living in groups with other birds such as their parents [1,9]. Living in the area that they grew up with their parents may also protect them from predators, and give them access to more resources [9].



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