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Question:

I was wondering if there was any expertise of people in this subreddit on how different species of birds choose where to make their nests. Will nest location often be random, or will certain species go to a great length to optimise their choice of nest location.

If a bird does spend a great deal of time choosing their nesting site, is that behaviour often used as an indicator of intelligence? It seems like if a bird is capable of weighing a number of different factors in its choice of nest location, that would imply a certain degree of cognitive capacity.

Edit: Wow thank you for everyone who supplied all these excellent replies, I definitely got more than I expected! I've become sufficiently intrigued that I think I'm going to start doing some more research into this topic, so I would really appreciate people sharing sources for the helpful info they provided. I will of course come back and share anything new I find :)

Response 1:

Great question! This was something I studied a lot during my MSc, so maybe I can get you started.

There are a number of different factors that influence nest site selection, depending on the species. These include social factors (territory boundaries, neighbours) and physical factors (camouflage from predators).

An example of what seems like deliberate selection: I found a nest that was built on obviously sub-par habitat (out on an old airstrip) because the rest of the territory was on impossible nesting habitat (a recently-burned area). The birds refused to nest on the recently-burned areas until the ground vegetation started to grow back.

An example of what seems like random selection: I once found a nest under a tiny young tree (not good camouflage) when there were

plenty of older, larger trees in the territory. Needless to say, this nest was quickly predated.

In general, it's difficult to quantify animal behaviour, and to determine whether it's deliberate or not. We do know, however, that young females in their first year of nesting often choose poor sites or are not very good at building their nests. So there does indeed seem to be an element of learning and experience involved.

If you're interested in avian cognitive capacity I recommend looking into the Corvid family. There have been some really interesting behavioural experiments done with crows and ravens that demonstrate a capacity for facial recognition and tool usage. Hope this helps!

Response 2:

Some birds certainly seem to have no idea how to be logical about nests. For example, the white tern lays its eggs in the [nooks of random branches](#) which really seems like it would be [detrimental](#) to the survival of the species. I don't know much about the their intelligence though

Pigeons will make really loose, scattered, half assed nests on flat ledges that are easy to be swept away, but pigeons are incredibly smart birds. I'm not sure it's a thing that's a very good indicator of intelligence - Even if pigeons and Terns make crappy nests, they seek out a location and choose as carefully as any other bird. Living in a city I see some pretty clever pigeons nests!

Response 3:

I'll toss in my anecdotal just for fun (I've never studied nest-making, but I've spent a fair amount of time with nesting birds).

In general, it seems that older, more experienced birds are better at selecting nest sites and actually building the nests. Many species have to hold a territory first, *then* build the nest on that territory. Older, stronger, or more dominant birds tend to be able to acquire and hold the best territories. Birds with good territories have greater freedom to pick good nest sites and will have more resources to draw from.

The birds I worked with had a choice of man-made cavities to select from at our study sites. We had tons of cavities available, but they'd never all get used; birds would pick and choose, and some cavities would never, *ever* get used, even by young birds. Those cavities

tended to be in exposed areas with poor cover (no protection from predators), with little undergrowth to hide in and no trees to shade the cavity. That implies that the birds were deliberately selecting nest sites rather than picking just any old cavity.

Thanks for this reply! What were the species you were working with? I'm very curious about these birds that learnt to select better nests over their lifetime.

Both Black-capped and Carolina Chickadees. Unlike some other species mentioned in the comments, they have a *strong* dominance hierarchy; they live together in winter flocks that develop a clear ranking system. Dominance is associated with many things, but age is an important one. Dominant birds get a lot of perks, including first crack at food sources. In the breeding season the flock breaks up into pairs and each pair defends a territory, even from other flock-mates. The most dominant pair usually ends up with the best territory. Because dominance is correlated with age and a bunch of other things (plumage brightness, etc.), it's hard to know which factor is most important to increasing reproductive success.

Anecdotally, however, it appears that experienced breeders seem to do better. The birds often don't make it past their first or second year. The ones that did really stood out, and they seemed to have greater nesting success. Experienced breeders also tended to choose the same nesting areas year after year and would defend them ferociously. I remember one female - I think she was three or four years old - who was the only bird we ever saw *successfully* defending her nest against a House Wren. The wren actually reached into the nest cavity and grabbed her by the leg, trying to pull her out. She managed to hold her position and fight the wren off! She had nested in that location before, but the wind had blown down some trees around it that year. House Wrens prefer more open areas, so the wrens were suddenly putting a lot of pressure on that nesting site. We were really impressed that the chickadee pair was able to fend them off for an entire breeding season; most other wren-attacked nests fail.

I think time spent looking for a nest site depends on a lot of factors like life history of the bird species in question, age/experience of the parent, phenology, inter and intra specific interactions, territoriality, etc.

Some examples: Early in the nesting season, especially in the first weeks post-arrival from their wintering grounds, I have seen female Cerulean Warblers actively "testing out" potential nest locations in the forest canopy. The females will flit to various potential substrates and in each, she will crouch down, puff up her belly feathers and then proceed to shuffle and shimmy around as if sitting in an imaginary nest. I have seen this behavior while nest searching in TN and OH, and I have actually seen females build nests in the exact spots they "tested out" a couple days earlier. It seems these birds are exhibiting a capacity to weigh different possibilities to make decisions. But, I think this behavior wanes as the breeding season progresses; birds that suffered nest failures their first, second, third time around have less and less time to re-initiate nesting attempts before the breeding season ends, so nests later in the season are more hastily built. I saw this really clearly in TX when I nest searched for Golden-cheeked warblers; there you could easily tell that as females suffered nest failures and were forced to re-nest later and later into the season, the quality and robustness of the nests decreased. And like others have said, nest site selection also depends heavily on territorial behaviors and competition with other birds using the same habitat.

I also think that it also depends on the life history of the bird: Birds like Yellow-billed cuckoos, pigeons and doves, and birds that have semiprecocial young tend to build low quality, flimsy nests because the chicks leave them very quickly and nest quality is less important. I don't think this behavior has anything to do with intelligence; it's just a product of their evolution.

Thanks for this reply! The testing out of different nests that you describe is really interesting. I was wondering if you know of any literature that talks about this behaviour in the Cerulean Warblers (or other birds), or if that is purely anecdotal. I definitely will have to do more reading, but it really seems to me that this weighing different possibilities to make their decision would be a sign of intelligence (which of course would be a product of evolution, but intelligence nevertheless).

Really got me thinking, I definitely want to learn more!
