Articles

Finding (and Watching) Gray Jays in Algonquin Park

by
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The Gray Jay (*Perisoreus canadensis*) is one of the northern birds most "wanted" by birders living in the urban and agricultural areas of southern Ontario. Although this species occasionally makes fall and winter flights into the south, the southern birder who wants to see Gray Jays must go north. This article will describe how to find Gray Jays in Algonquin Provincial Park, one of the most convenient and reliable places available to the southern birder. Also, since Gray Jays are so eminently observable and have been the subject of serious study in Algonquin for over 30 years, I will attempt to point out a few aspects of this bird's fascinating behaviour that might not be obvious to the first-time or occasional Gray Jay watcher.

To appreciate the value of Algonquin Park as a place to observe Gray Jays, one need only consult the *Atlas of the Breeding Birds of Ontario* (Cadman *et al.* 1987). In common with Boreal Chickadee, Cape May Warbler, Rusty Blackbird, and a few other northern birds, the Gray Jay's breeding distribution shows a distinct concentration of confirmed and probable squares in the Algonquin highlands. The measurably cooler climate conferred by the Park area's higher altitude of up to 585m (1900 ft) above sea level favours a correspondingly greater presence of spruce (*Picea* spp.) and other boreal forest elements, and this apparently renders the area suitable for Gray Jays. There are breeding Gray Jays elsewhere in southern Ontario, most notably at Petroglyphs Provincial Park near Peterborough, fully 100km south of Algonquin, but such examples are quite isolated. Generally speaking, Gray Jays drop out of the picture quite rapidly as one descends from the Algonquin highlands in any direction, including northwards. Where I live, for example, just outside the Park on Highway 60 at Oxtongue Lake, Gray Jays are confined to isolated spruce bogs, even though a ten minute drive can get me back into more extensive Gray Jay country inside the Park.

I do not want to create the impression, however, that Algonquin Park is "wall to wall" Gray Jays. Even in true Gray Jay country, the real boreal forests found much farther north than Algonquin, Gray Jays are no more densely packed than 1.46 pairs per square kilometre (Strickland 1968). In Algonquin Park, almost at the southern edge of the breeding range, the breeding density of Gray Jays has been only about 0.68 pairs per square kilometre, at least in the areas where a marked population has been followed over the last 25

years. If anything, there has been a trend to an even lower figure with many formerly occupied, but apparently marginal, territories dominated by deciduous forests now mostly empty of Gray Jays. For example, all three of the former Gray Jay territories around the Algonquin Park Museum are now vacant, although a quarter of a century ago they figured prominently in the work of the late Russell J. Rutter (1969), a famous park naturalist (Figure 1) who began the Algonquin Gray Jay study and sparked my own interest in the species.

I do not know whether the disappearance of Gray Jays from many traditional Algonquin Park territories is part of a long term trend. Nor do I know what might account for such a trend if it is real. It is to be expected, of course, that any individuals (of any organism) living near the edge of their breeding range will be extremely sensitive to even the most minor shifts in environmental conditions. By definition, after all, those individuals are living very close to areas where conditions are sufficiently hostile to exclude them as breeders. One is tempted in the case of Gray Jays to speculate that the warmer climate we seem to be experiencing in recent years might be just enough to render uninhabitable territories that until then had been just within the limits of acceptability. As for exactly what it might be about warmer temperatures that would exclude breeding Gray Jays from formerly suitable habitat, your guess is as good as mine! It does seem undeniable, however, that something must be stopping Gray Jays from breeding farther south than they actually do. Whatever that something is, moreover, it seems plausible that it would move north if the climate is indeed warming up.

Be that as it may, Gray Jays are still very much part of the Algonquin Park scene, particularly in low-lying, "boreal" areas of black spruce (*P. mariana*). There are a number of such areas in the Highway 60 corridor section of Algonquin which starts just 40km east of Huntsville. This is the easiest part of the Park to visit for southern birders driving up from the Toronto area to look for Gray Jays and other northern species. Of particular note are the Opeongo Road that travels six km north from Highway 60 starting at km 46.3 (measured from the West Gate), and the Mizzy Lake Trail, starting at km 15.4. The locations and other expected birds of all three areas are described in the *Checklist and Seasonal Status of the Birds of Algonquin Provincial Park* (Tozer 1990), and detailed directions for birding the Spruce Bog and Mizzy Lake trails are available in the excellent article by Ron Tozer and Ron Pittaway on finding Spruce Grouse in Algonquin Park (Tozer and Pittaway 1990). It also helps to drop in at the Algonquin Park Museum at km 20 (go to the back door during the off season). Staff will always be glad to direct you to good Gray Jay places based on the latest observations if you are having any trouble finding them on your own.

Far more important than knowing where to look for Gray Jays in Algonquin is knowing when to look. Although these birds live on the same permanent territories year round, there are times when finding them is child's play and other times when the frustrated birder will be ready to

Figure 1: Russell J. Rutter (1899-1976), the well-known park naturalist who started the Algonquin Gray Jay study and inspired the author's interest in this remarkable bird. Seen here holding a 16 day old nestling, April 1968. Photo by *Dan Strickland.*

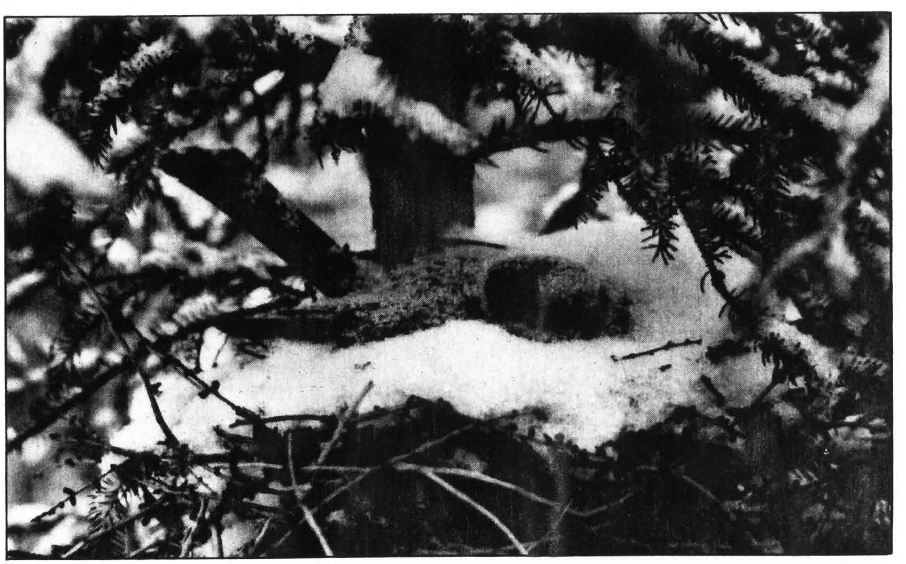

Figure 2: Female incubating in a snowstorm, 1 April 1968. Her three eggs all hatched three days later. Photo by *Dan Strickland.*

declare them extinct. The bad time is the warm half of the year, although it starts with the onset of the Gray Jay incubation period near the end of March (Figure 2). From then to the middle of October, one could never be sure of going out and seeing Gray Jays even in the best of habitat, and in June and July, you can almost be sure of not seeing Gray Jays, no matter how hard you try. My best illustration of how tough it can be was in 1986 when the Park hosted a side trip from the 19th International Ornithological Congress held in June of that year in Ottawa. Twenty ornithologists from as far away as Australia and the Soviet Union had chosen the trip to the Park particularly in the hope of seeing a Gray Jay (official symbol of the Congress), and we did our best to accommodate them. For three days, two excellent birders from our summer naturalist staff repeatedly guided the group to all the right places and turned my study area "upside down" -- but all for nought. Not a single Gray Jay was seen and the group left empty-handed, much to their disappointment and my embarrassment.

Because looking for Gray Jays in the summer is so unrewarding, and also because work leaves me so little opportunity at that time of the year, I hardly even try then. Instead I wait until mid-October, after Canadian Thanksgiving, and do what I call my annual fall Gray Jay "round-up". By then Gray Jays are easy to find, and I improve my chances even more by taking an afternoon to put up suet bait in each Gray Jay territory I want to check. The next day I start patrolling my baits and usually have no trouble catching up with the occupants of 25 or 30 territories in just a day or two. This includes not only merely seeing the birds but catching and banding any new birds that have replaced previously known individuals that have disappeared over the summer. Visiting birders usually don't have the luxury of being able to set up suet feeding stations to simplify the task of finding Gray Jays, but then they usually don't need to find 25 pairs in just one day in order to be happy! One or two pairs are probably quite sufficient for most people, and the effectiveness of my fall round-up should show how responsive Gray Jays are and how easy they are to see starting in mid-October -- in marked contrast to the trouble they can be earlier on in the summer. Indeed, for the rest of the fall and winter, Gray Jays are almost impossible to miss seeing in suitable Gray Jay habitat, except on days of high wind or snowstorms. On Algonquin Christmas Bird Counts, for example, we routinely get totals of 50 to 60 individual birds. This is far from all the Gray Jays in our count circle but it is still a respectable showing and virtually every observer sees a pair or two.

There is a particular reason why Gray Jays are easy to see (during the cold season) in Algonquin Park that many birders may not appreciate --namely that the birds are well trained. Contrary to popular belief, Gray Jays do not instinctively seek out people; they must learn to associate us with food, and until they do, they are about as wild and unlikely to deliberately reveal their presence as any other kind of bird. Fortunately for the birder visiting Algonquin Park in search of Gray Jays, however, almost all of the

individual birds inhabiting the places he or she is likely to visit have received a good education, either from me, other birders, or ordinary tourists, all of whom have shared many a lunch with Algonquin Park Gray Jays. A lesson learned by a Gray Jay is a lesson never forgotten. The result is that individual birds habituated to humans will "drop whatever they are doing" and fly over to any human being they spot, even hundreds of metres away, to look for a handout. Birds that would have remained far away and unnoticed if they were truly wild, unhabituated Gray Jays actually seek out birders or any other human being that comes onto their territory. Needless to say, this enormously improves a birder's chances of seeing the birds and the fact that most Algonquin Park Gray Jays are "broken in", at least in the most frequented areas, is yet another reason why Algonquin is an excellent place to look for them.

Because many individual jays are so tame that they will literally come and take food out of your hand, they provide unsurpassed opportunities for close-up observation. This brings us to the second part of this article which has to do with actually watching the birds after you have found them -- or rather, they have found you! Some people would argue that the most interesting part of the observation of any bird is watching their behaviour and getting an insight into their ecology (how they make a living), rather than merely counting the bird as another species seen. This is particularly true in the case of Gray Jays because the relationship between their behaviour and social organization is especially complex, and yet parts of both are readily observable.

If you present food to the pair of Gray Jays that alights beside you in Algonquin Park, for example, you will quickly see some remarkable behaviour that is the secret of the Gray Jay's biology and its success in the boreal forest. Instead of actually eating the food, a Gray Jay will break off a piece, work it back and forth in its closed mouth, fly back into the forest, and tuck the food behind a flake of bark, under a tuft of lichens or in some other similar hiding place (Figure 3). Sometimes, if you're really lucky, you might even see a Gray Jay reach over, pull off another piece of bark and jam it in on top of the hidden food as if to conceal it even better.

Here is the secret of the Gray Jay's success and in particular of its ability to live year round in the great boreal and sub-alpine forests of North America while almost all other birds are forced to leave each fall. Gray Jays get around the otherwise fatal lack of food by falling back on the thousands of pieces of food hidden away the previous summer and fall. The food is secured in place by the sticky saliva produced in the bird's enormous salivary glands and applied just before storage (Dow 1965). As for recovery, recent work suggests that, incredible as it may seem, Gray Jays actually remember their storage locations (Bunch and Tomback 1986, Strickland 1991). It is mind-boggling to think that the pair of Gray Jays you encounter on your visit to Algonquin, and watch making trip after trip back into the bush, could really be remembering every place they use to hide food, not to mention all the places they have used in the

Figure 3: Gray Jays coat food with sticky saliva produced by greatly enlarged glands, and then hide it under lichens or behind flakes of bark. Recovery is apparently achieved through memory of individual storage locations. Photo by *Dan Strickland.*

Figure 4: This Gray Jay nestling has just received the unique combination of coloured bands that will permit easy individual recognition later in life. Photo by *Dan Strickland.*

previous weeks and months. After all, none of us could match such mental prowess. Nevertheless, that's what the evidence seems to suggest, and when you get right down to it, remembering a few thousand hiding places in a spruce forest may not really be any more impressive than other "intellectual" feats accomplished by birds that we are used to and now take for granted --like Bobolinks finding their way to Argentina and back every year.

A second major thing you will notice about Algonquin Park Gray Jays is that most of the ones you see are likely banded, each with its own unique combination of two or three colour bands and one standard aluminum band (Figure 4). The technique of colour-banding, which permits recognition of individual birds from a distance without having to recapture them to read a number on a standard aluminum band, is routine in long term studies of birds but there aren't many places where birders ever get to see it being applied.

Visitors to Algonquin can not only see a good, up-close example in the form of my colour-banded Gray Jays, they can also make a real contribution to the study by reporting the colour combinations of banded birds to the Park Museum, and they may derive an extra measure of interest and pleasure through learning the history of the birds they have observed. In recording colour combinations, the main thing you need to remember is to jot down (don't trust your memory!) which colour is above which other colour on which leg. That is to say you have to distinguish between "red over white" and "white over red", as well as between the left leg and the right. It is also important to distinguish between light and dark shades of blue and green, since all four are used in the Algonquin Gray Jay project. I find it very useful to name each bird according to its band combinations. Thus, a bird named WOPLOOSR (pronounced they way it looks) would have been banded as "White Over Purple Left, Orange Over Standard Right", or if you reported seeing a bird with the combination of red over standard left, yellow over purple right, I would know that you must have seen good old ROSLYOPR, banded as a Hermit Creek nestling in 1986 and now a territory-holding male at Sunday Creek.

The colour-banding technique transforms otherwise anonymous and unknowable birds into the distinct individuals they really are. It is also the indispensable key to learning the rudiments of the species' social organization. For example, by following the occupants of each Gray Jay territory from one year to the next, one can observe how often the identity of the territory-holders remains the same, and how often the marked birds disappear and are replaced. The disappearance, or mortality, rate of Gray Jays tells us a great deal about how effective their "store-food-and-stay-at-home" strategy really is. For males and females combined, the average mortality rate for territory-holding adults in Algonquin Park over the last 25 years has been about 18% (i.e., 18 of 100 territory-holding adults disappear every year, and 82 stay the same from one year to the next). Most migratory birds have mortality rates far higher than this; in fact annual mortality rates close to or

greater than 50% are quite normal. Right away we can see that Gray Jays, by doing away with the need to migrate, achieve a major payoff in the form of a lifespan that is much longer than that enjoyed by migrants. The oldest known Gray Jay in Algonquin Park to date was a female banded as a nestling in 1969 by Russ Rutter that was last seen when 16 years old.

The effectiveness of food storage shows up especially clearly when we analyze mortality rates according to season. About three quarters of what little mortality there is actually takes place in the summer, not in the winter when you would expect it! In other words, Gray Jays (at least at the southern edge of their range in Algonquin Park) have absolutely no problem with the supposedly deadly winter season. Something, almost certainly their food stores, apparently confers virtual immunity on Gray Jays in winter. And if you have any lingering doubts on the subject, the reason that habituated Gray Jays eagerly take food for hours on end from the occasional human who enters their territories in winter cannot be that the birds are "starving to death". Rather, the eagerness of winter Gray Jays is probably best explained by the idea that these birds are highly motivated to store any food they come across, and when we walk into their territories in winter we represent the only source of new, storable food that the birds have seen for days or even weeks or months. (By the same token, incidentally, this may explain why Gray Jays are so hard to find in summer. At that time of year, humans on a Gray Jay territory are far from the only source of storable food. Why should a Gray Jay bother with people when the woods are full of opportunities to store natural food?)

Another aspect of Gray Jay biology revealed by colour-banding, and about which the casual jay watcher can get an inkling, is the bird's social organization. Normally the Gray Jays you encounter will be in pairs. These are in fact almost always true breeding pairs, a male and female who nest in the same territory year after year and remain mated to each other as long as both birds are alive. When one bird dies it is usually replaced quite quickly, although sometimes the widowed bird will itself move to fill a breeding vacancy elsewhere.

Rather than encountering a pair of Gray Jays, however, you might well run into a threesome, and it is in that situation that relationships become especially complex and interesting. Gray Jays normally lay three eggs, and an impressive two thirds of all pairs succeed in fledging young. Nevertheless, by the time fall rolls around and the birds become reliably findable again, after their long summer of virtual undetectability, the pairs are either all alone again or accompanied by just one extra bird (i.e., making a threesome). Juvenile Gray Jays moult into adult plumage in July, and certainly by the end of August are indistinguishable from adults. In mid-October, accordingly, there is no hope of telling from plumage which two of a threesome are the pair and which, if any, is their young from the previous spring. It has taken years of finding nests and colour-banding the nestlings to establish that most of the extra birds in the fall trios are indeed single young birds still with their

parents. Much more surprising is the finding that almost 30% of the extra birds are not the young of the pairs they are with, but in fact were hatched on other territories. For some reason these birds have left their original territories and taken up residence with unrelated adults elsewhere.

These peculiar goings-on have been only slightly clarified by the rare observations of Gray Jay family groups actually breaking up in June. When the young are between 55 and 65 days old, they start to fight amongst themselves with increasing hostility until one young, the dominant juvenile, has expelled its siblings from the natal territory (Figure 5). This, then, accounts for the fact that if any young bird at all remains with its parents the following October it is alone. It also explains the origin of the extra birds who form trios with unrelated adults. Apparently some of the youngsters expelled from their natal territories succeed in finding a degree of acceptance with other pairs who are unaccompanied by young of their own (presumably because their nesting had failed).

Beyond these bare facts lie the why's. Why do "family groups" in the fall consist of just a pair and one extra bird at the most? Why should a dominant juvenile expel its siblings from the natal territory (and in the

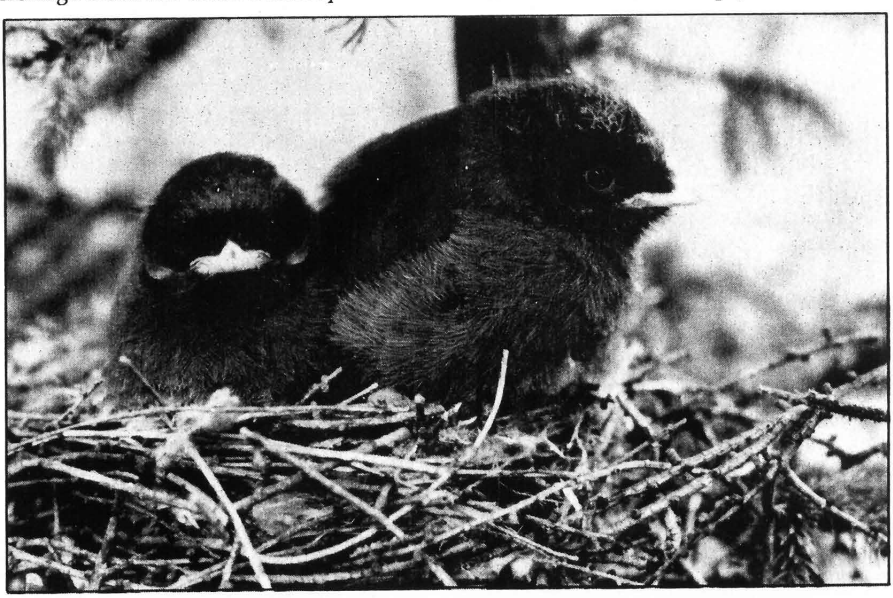

Figure 5: These two 21 or 22 day old nestlings will leave the nest in a day or two. At about 55 days of age they will become increasingly aggressive towards each other, and within 10 days one will have expelled the other from the natal territory. The dominant juvenile will remain in a trio with its parents until the onset of the next breeding season. The "ejectee", if it survives at all, will form a similar trio with unrelated adults whose own nesting has failed. Photo by *Dan Strickland.*

process condemn them to a much higher probability of early death)? I personally think (Strickland1991) that the behaviour is probably best explained by the inability of young Gray Jays to store enough food for their own first winter survival, and their consequent need to be subsidized by extra stored food provided by the parents. If the parental subsidy is reliable for only one extra young, however, it would be in the interest of each young to get rid of its former nestmates and thereby achieve exclusive access to the parental subsidy. And, if stored food is recovered by memory as I have suggested, it will be in the interest of the young birds to get rid of their rivals as soon as possible -- in June, at the beginning of the food storage season, rather than later. That way (and only that way), the rivals will be prevented from ever knowing where the vital parental subsidy of stored food is hidden.

These are some of the questions one can ponder when enjoying the visit of tame Gray Jays in Algonquin Park, and which have been at least partly answered by carefully watching colour-banded individuals over the last 25 years. But there are many other intriguing questions as well. Questions like "Just why do they nest in late winter when there is no obvious food around and most other birds haven't even come back to the Park, let alone started to raise young?". Or, "Why don't the dominant juveniles who stay with their parents until the following nesting season help their parents to raise a brood of younger brothers and sisters? After all, many tropical birds that also retain non-breeders in the family group until the next breeding season do this, so why don't Gray Jays?"

It's fun under any circumstances to admire a soft, fluffy Gray Jay perched on your hand waiting for more of your lunch. It's even more fun to peer into its big, dark eyes and try to figure out what is really going on in its remarkable little brain, and why these birds do the things they do. A winter visit to Algonquin Park affords an almost sure fire opportunity both to find Gray Jays in the first place, and then to settle down for some serious watching as well. Good luck in both endeavours!

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