

MCBBA2 Block Survey Guide

Breeding Behavior and Breeding Codes

The breeding cycle. Each of our breeding species has a unique breeding cycle, and this cycle is the principal object of our study. When reproductively mature individuals of one of these species approach or attain breeding state, they seek out and settle in habitat that meets their species' basic requirements. At any stage, from prospecting to egg-laying, the cycle may be broken; however, it is important to bear in mind that our goal is not to measure breeding success as such. If a pair of American Robins lose their eggs to a marauding California Scrub-jay, their results (if discovered during a survey) nevertheless count as breeding confirmation. We are looking for and recording landmarks in the breeding cycle, not the successful rearing of young as such.

Standard breeding codes. The use of standard breeding codes is a staple feature of breeding bird atlases. Our codes will be introduced and defined below. Roughly speaking, each code represents a milestone in the average breeding cycle, ranging from the bird's detectable presence in breeding habitat all the way to the eventual nest with eggs and feeding of young. MCBBA2 has adopted the breeding codes established as a continental standard by the North American Ornithological Atlas Committee (NORAC). These codes are very similar, but differ slightly, from those used by MCBBA1. The slight differences will not affect our ability to compare our findings with those of our predecessor.

Confidence level. Breeding codes are arranged in a more or less standard sequence from 'lowest' to 'highest'; that is, from detection in habitat to observation of eggs. The sequence is not meant to map the breeding cycle precisely, so much as it is meant to reflect the increasing confidence with which the observer can determine the likelihood that a given pair have bred. If it did map the breeding cycle, for example, you might expect the feeding of young to follow (that is, to rank 'higher') than the detection of a nest with eggs. But owing to the mobility of birds and the quite variable duration of dependency, the observation of that behavior merits slightly less confidence than the presence of eggs. We speak, then, of a scale of confidence that rises in a hierarchy of three grades: possible, probable, and confirmed (abbreviated PO, PR, CO). Accordingly, each landmark in the breeding cycle that is represented among the breeding codes is assigned to a confidence level. This assignment remains fixed. Each code, so to speak, lives within its assigned level; in other words, the observer is not entitled to move a given behavior into a new level of confidence. The only means of achieving a higher level of confidence for a given species or breeding pair is to observe a different, 'higher' form of behavior.

Mapping confidence. It has become conventional in the maps of breeding bird atlases to represent the breeding distribution of individual species with symbols that stand for the three confidence levels. On such species maps, each of the grid units (study blocks) is stamped with one confidence symbol. With practice, it is easy to get a sense of known and suspected breeding ranges at a glance. We will display the progress of our atlassing efforts using these and other conventions. As part of your preparation for field work, we recommend not only that you use our Data Explorer to discover the list of species that have historically bred in your block, but also where else each of the species of that list has bred in the county. To do that, you may also consult Shuford 1993. See 'Useful Links' on our website.

Assigning codes to observed behaviors. On every site visit, you will be faced with many kinds of behavior whose ultimate aim is successful reproduction. Admittedly, much of this behavior will be ambiguous. At times, you will have sufficient doubt to withhold a breeding code altogether (though you should always include the bird or birds in your daily count). Remember: the observer is the arbiter. If you are taking responsibility for a block or are gathering evidence as an AO, you have found your way into that position because we trust your judgment. If in doubt, weigh your options and decide which of two (or several) codes best characterizes the behavior you have witnessed. Chances are that the options you have narrowed down both (or all) occur under the same confidence level; in other words, the breeding status of the bird in question is not likely to be at play in your deliberation between codes. In extraordinary circumstances, you should of course consult your regional coordinator, who can help you work through the options or send another observer to try and resolve your ambiguous case. However, we do hope that you learn to use the codes well and apply them judiciously.

Should you strive for confirmation? For many atlassers and atlas coordinators, confirmation (that is, scoring an observation at the highest confidence level) is the Holy Grail. We understand that impulse – and share it, too. However, the better should not be the enemy of the good. If you exhaust your available time attempting to ‘upgrade’ a bird from probable nesting to confirmed, you may find that many other valuable data elsewhere in your block have gone by the boards. Here again, judgment is called for. For many secretive and nocturnal species, a ‘probable’ record is plenty good. In such cases, conservation biologists will often treat PR and CO as virtually equivalent. Moreover, it often happens that obtaining a higher-level code comes at the cost of unacceptable disturbance to a sensitive species. If so, a responsible observer will be prepared to accept a probable code.

Our adopted codes, with explanations. Below, we provide a sequential list of the breeding codes used in this project with a brief explanation of each. As noted before, for MCBBA2 the ‘breeding season’ falls between 15 April-15 July, the period during which breeding records of all confidence levels are accepted. Only behaviors falling under the highest confidence level (confirmed) are gathered before and after this time. An exception is made for owls, nightjars, and species of conservation concern: in these cases, records of ‘probable’ breeding status that fall outside the ‘breeding season’ will be accepted. In the interest of a concise exposition, certain repetitive phrases have been suppressed from the glosses (or explanatory definitions). Thus, all glosses assume ‘on a single site visit, in a single study block, and within a single breeding season’. All PO, PR, and CO glosses additionally assume ‘in suitable habitat’.

MCBBA2 Breeding Codes¹

In Ascending Order of Confidence (Lowest to Highest as you Read Down)

PR codes marked (*) and all CO codes indicate behaviors that must be pinpointed with geospatial coordinates. Methods for doing so are explained in the next section, The Field Card.

Encountered

E	Encountered. Use this code to count individuals whose species breeds in the area but who themselves are not breeders. Used mainly for juveniles, wounded birds, failed breeders, and birds of indeterminate status. At the beginning of the season, individuals of most passerine species are capable of breeding; towards the end of the season, code E is available for likely immatures of all species.
----------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Observed

O	Observed. Known not to breed (or highly unlikely to do so) in the block in which it is observed. Examples: Great Blue Heron fishing far from its heronry; late migrant.
F	Flyover, but known not to breed (or highly unlikely to do so) in the block in which it is observed. Do not use this code for birds in flight when they are likely to breed there.

Possible [PO]

H	Mature male or female (presumed breeder) of a species located in its habitat . For non-breeders, see E , above.
S	Singing male or other territorial behavior (such as woodpecker drumming, calling of non-singers, hummingbird display). Use code M for multiple singing; use code D for singing over multiple days.

Probable [PR]

M	Multiple (3+) singing/calling/drumming males (or displaying hummingbirds) on territory. In April and through the latter days of May, it is best to reserve this code for resident species, unless you can return to the area to check and verify at intervals of less than seven days, since there is still considerable flux early in the season.
P	Associating male-female pair. Use mainly for sexually dimorphic species, that is, those in whom the sexes are visibly distinct. This code is not useful in the case of monomorphic species, unless the association you observe is very close and loyal, just short of code D .
*T	Individual defending territory , as suggested by salient presence in a single location over seven or more days. Use this code for singing males, displaying / perching (e.g. of hummingbirds), an individual raptor occupying territory. In the case of singing, however, be cautious. Considerable movement is still occurring in April and May, so use this code in those months for resident birds and arriving breeders that you have been able to watch carefully. Actual aggression towards an individual of the same species is classed under D . Contrast A , below.

¹ With the sole exception of code **E**, codes and descriptions are based closely on Beck et al., *North American Ornithological Atlas Committee Handbook* (Port Rowan, ON, Canada, 2018). Additional guidance was gained from Alex Rinkert, "Breeding Code Definitions," Santa Cruz County Breeding Bird Atlas (Santa Cruz, CA, n.d.).

*D	Display or courtship involving a male-female pair. This code includes courtship feeding, copulation, many forms of pair-bonding behavior, and antagonistic territorial dispute, when directed at members of the same species. See also A , below.
*V	Visiting probable nest site. Use when you are not <u>certain</u> of an active nest (or one under construction), but find a bird prospecting. Code AE indicates higher certainty.
A	Agitated behavior / anxiety calls associated with a territory. These behaviors are directed at other species: a California Towhee attacking a neighborhood cat, for example. Mobbing of a raptor should attract your closer study, but is not itself necessarily classed here. You yourself may be the object of agitation.
B	Brood patch on adult female or cloacal protuberance on adult male; also, gravid female. This code is used <u>only</u> by bird banders and other specialists handling birds.
*N	Nest-building by birds that build multiple nests. These include wrens, corvids, and plovers, possibly Black Oystercatcher. Use this code also for excavation of holes by woodpeckers (which might be roosting cavities). Confirmation of the spp mentioned here requires higher codes.

Confirmed [CO]

NB	Nest-building at the actual nest site or adults carrying nesting material. Use this code for taxa not mentioned under N , above. Use if you find a bird carrying material, even if you cannot locate the nest site. But do consider your situation with respect to the boundaries of your block and the availability of good habitat on each side of that boundary. Try to note the patch of habitat being used by the bird. Use judgment.
DD	Distraction display or feigning of injury, meant to lure away a predator.
NU	Nest used previously during the current breeding season, though no longer occupied; or raided by a predator. Use this also for eggshells of the current season. Be very careful assigning a nest or eggshells to species. Take photographs of both.
FY	Recently fledged young or downy young. Use of this code implies that the young in question are unlikely to have moved into the block from another block. Look for: dependency on adult and undeveloped ability to fly. In case of doubt, use code E .
AE	Adult entering , occupying, or leaving nest site in circumstances indicating an occupied nest. Use code V for cavity-nesters making brief, exploratory entries; in the case of truly occupied nests (AE), they are detained longer within. Use for bird on nest.
FS	Adult carrying a fecal sac .
CF	Adult carrying food for young. This code is used for the feeding of young either inside or outside the nest. Caution: adult females of several species, especially cavity-nesters and goldfinches, 'beg' for food as part of courtship display. For these, you will use code D . When one adult is feeding an adult that is incubating eggs, the correct code is AE . Further caution: certain birds often carry food (for themselves) over long distances (leaving your block): raptors, ardeids, gulls, corvids, etc. For these, use code F .
NE	Active nest containing egg(s) . Eggs of Brown-headed Cowbird confirm both host and cowbird. Eggs must be seen by observer.
NY	Nest with live young seen or heard. Young of Brown-headed Cowbird confirm both host and cowbird. At least one live nestling. If none, use code NU .

Choosing the highest breeding code for an individual. It sometimes occurs during field work that a given individual is observed engaging in various kinds of identifiable breeding behavior

during a single act of observation. For example, while you stand and watch, the bird may show territorial agitation, display aggression, gather food for a mate or young, etc. For an individual bird on a single site visit, given multiple observed behaviors, always record the highest possible breeding code. (Remember that our list progresses from lowest to highest as you read down the page.) As explained in the next chapter, “The Field Card”, you may go on to find further breeding behavior in a different individual of the same species – and we are having you enter that evidence in a new line for most PR and CO codes, even where the code may be lower than one already entered for another individual of the species.

Transferring breeding codes from eBird into CADC. The section, ‘Using eBird for Atlas Work’ includes a table comparing eBird’s breeding codes with our own. Please refer to that concordance when entering data in CADC. The differences are minor and are not likely to have a bearing on the manner in which the bird is ultimately mapped in our atlas.