Maryland & DC
Breeding Bird Atlas 3
2020–2024

Handbook and Guidelines

BBA3

December 2019

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Acknowledgements

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If you have any questions or comments related to the Atlas, please contact your County Coordinator (page 40) or the Atlas Coordinator, Gabriel Foley, at mddcbba3@mdbirds.org.

Introduction

The Maryland & DC Breeding Bird Atlas 3 (MD-DC BBA3) is a comprehensive five-year survey of the birds breeding in Maryland and DC. As with the first two MD-DC atlas projects (1983–1987 and 2002–2006), this atlas will result in detailed distribution maps of all 200+ bird species breeding in this region. The data used to produce these maps will be collected almost entirely by volunteer atlasers. They will collect data on breeding evidence using the protocols described in this handbook and those data will be housed in the Cornell Lab of Ornithology's internet data system, eBird. Because the data are collected using the same standard geographic unit as the first two atlases (approximately a 3 x 3 mile block), shifts in bird distribution over time can be seen; birds may no longer be breeding in a block they were previously found in, or they may be observed breeding in a block they were previously absent from. Relative abundance data were also collected for breeding birds across the region in the second atlas. Changes observed between the 1980s and 2000s were published in 2010. These data

have been used by MD DNR and conservation partners to identify the species and locations most in need of conservation efforts.

Birds are good indicators of an ecosystem's health because they are abundant, easy to observe, and they respond to environmental changes relatively quickly. As with other parts of their life cycle, birds are reliant on habitat for nesting. If suitable habitat is removed from an area, that bird can no longer nest there. This means that the distribution of breeding birds in a region is an indicator of the available habitat in that region. Protecting this habitat is critical to maintaining, not just a healthy bird population, but maintaining the healthy ecosystem that bird population represents. The Maryland & DC Breeding Bird Atlas 3 will expand on our current knowledge of the region's breeding birds and contribute to their conservation and management.

Quick Start

Below in Table 2 are some of the most important steps atlasers must take to provide high quality data. Please ensure you follow these steps while atlasing.

Table 2. Steps atlasers must take to provide high quality data for the Atlas.

What to do	How to do it	More details
Use the MD-DC BBA3 eBird portal	Only data entered through the MD-DC BBA3 eBird portal (ebird.org/atlasmddc/submit) will be used for the Atlas, so don't use the standard eBird portal to enter atlas data.	On page 42
Keep the checklist distance short and within block boundaries	The distance for traveling checklists should be short, preferably <3 miles. Ideally, a single checklist will be for a single major habitat type (*e.g.*, forest, agriculture, wetland) and for a single	On page 16

What to do	How to do it	More details
	property type (*e.g.*, park, state forest, wildlife management area, sanctuary). Additionally, checklists must not cross block boundaries.	
Submit complete, independent checklists	Checklists should include all the species you identified, and each checklist is independent of any other checklist. This means that the breeding codes you use should reflect what you observed on the current checklist. Do not use the breeding codes from previous checklists to guide which breeding codes you do or do not include on your current checklist.	On page 35
Provide a breeding code for each species	If you observe breeding evidence for a species within its safe dates, provide the appropriate code in your checklist, even for common species. And if you observe a species that isn't breeding, it should still be included on the checklist—just leave the breeding code blank. The Atlas will be able to create stronger inferences about distribution and reproductive phenology if more data are available.	On page 13

What to do	How to do it	More details
Provide details for species of special interest	Provide as many details as possible, including precise location, habitat, and number of nests, eggs, or young, and make an extra effort to confirm breeding, especially for uncommon species.	On page 32
Contact your County Coordinator if you find a sensitive species	Sensitive species include Northern Goshawk, rare owls, and Swainson's Warbler. If you observe these species, contact your County Coordinator before submitting the checklist.	On page 33
Sign up for a block	Consider signing up as the primary atlaser for one or more blocks. As the primary atlaser you won't be the only atlaser in the block, but you'll be responsible for ensuring the block completion targets are completed by the end of the Atlas.	On page 13

Purpose and Objectives

The Maryland & DC Breeding Bird Atlas 3 will refine our knowledge of the current distribution, relative abundance, and reproductive phenology of all birds breeding in Maryland and DC. Atlas data will support comparison with previous atlas projects and will be available in digital and book formats for such uses as conservation planning, land management, and academic research. To accomplish this purpose, the Atlas will focus on these fundamental objectives:

- Provide results that can be compared to previous Maryland and DC atlases.
- Provide uniform observer coverage across Maryland and DC.
- Document all bird species breeding in Maryland and DC.
- Estimate relative abundance of each bird species breeding in Maryland and DC.
- Estimate distribution of each bird species breeding in Maryland and DC.
- Provide data suitable for the conservation of local priority bird species and their habitats.
- Provide data that are accessible to decision makers.

To accomplish these fundamental objectives, the Atlas will:

- Use intuitive, user-friendly, and replicable methods that can be compared to previous atlases.
- Use a block-grid overlay to provide uniform observer effort across the entire region, including per-block coverage targets.
- Classify breeding evidence for each species in each block using standardized codes based on observed bird behavior.
- Determine relative abundance of breeding birds across the region using standardized methods such as miniroutes.
- Gather additional data on priority species, including but not limited to precise location, reproductive phenology, habitat, and relative abundance.
- Obtain abundance and breeding status data useful for public and other conservation lands management.
- Map breeding status across the region for each species.
- Provide data that are accessible to decision makers through publication online, in a major database, and/or in a book format.

The Atlas will also:

- Encourage collaborations with relevant organizations, government departments, and community groups.
- Raise awareness of birds in Maryland and DC and efforts to conserve them.

- Introduce community members from across the region to a new form of volunteer data collection.

Background and History of Breeding Bird Atlases

An atlas is a collection of maps. Maps visualize location-specific information in a condensed format that allows users to find information at a glance. In the mid-1960s, *The Golden Guide to the Birds of North America* introduced a revolutionary innovation: range maps*.* While other guides available at the time had brief, written range descriptions, these range maps showed the seasonal distribution of each bird species featured in the guide and allowed readers to quickly see if a bird was out of range or season. For example, a birder in central Georgia in June could focus on Acadian Flycatcher rather than Least Flycatcher, because the range map showed the Acadian bred in Georgia, but the Least did not.

At about the same time these range maps were being published, naturalists in the United Kingdom and Ireland were enlisting volunteers to map plant (1952-1959) and bird (1968-1972) distributions using a 10 x 10 km grid superimposed on the landscape of Britain and Ireland. Chandler Robbins, the main drafter of the Golden Guide's range maps, recognized the value of bird maps for showing in detail where birds lived. Such detail would give scientists, conservationists, and wildlife agencies current and accurate data about whether a bird was widespread or localized and where their habitat existed. If such surveys were repeated, they would also show how birds responded to changes in climate, land use, and other environmental changes.

Robbins encouraged the Maryland Ornithological Society to conduct the first breeding bird atlases in North America. These were county surveys conducted in the 1970s and were published late in the decade. The first statewide atlas projects were completed over the ensuing decade in Massachusetts and Vermont. By now, many states and provinces have produced bird atlases. Several, including Maryland and DC, have completed second breeding bird atlas projects. Now two regions, New York and Maryland and DC, have embarked on their third.
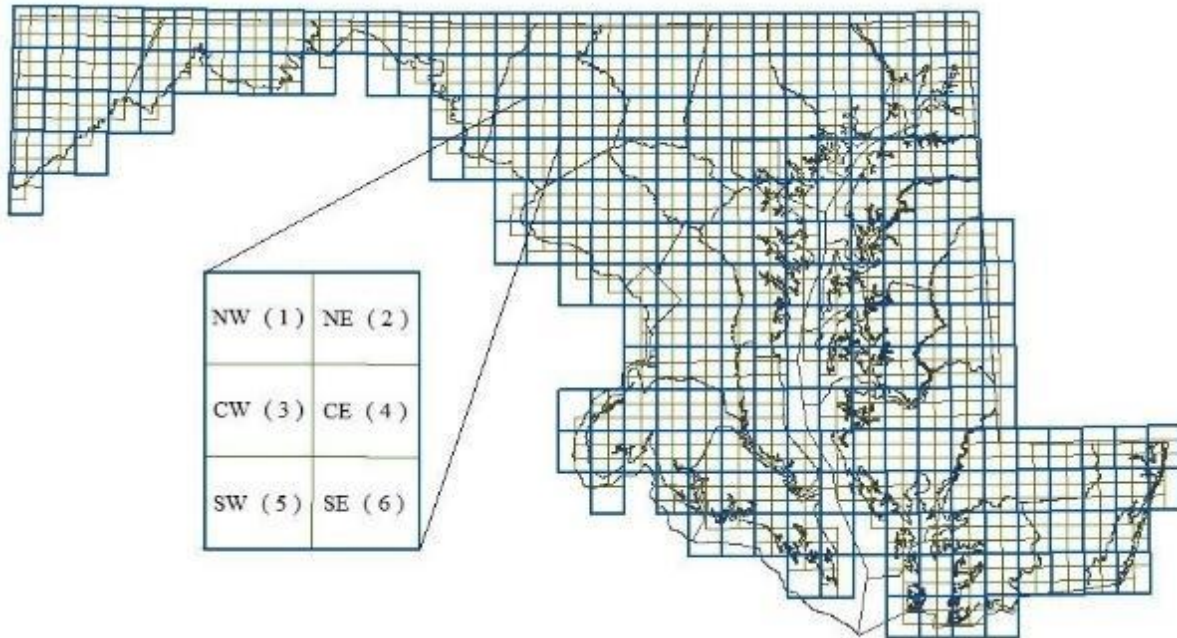
Figure 1. Maryland-DC block map. Each quadrangle is a USGS 7.5-minute map. Each block is ⅙ of a quadrangle. A block's location within its quadrangle is designated as northwest (1), northeast (2), center-west (3), center-east (4), southwest (5), and southeast (6).

Atlas Methodology

The making of a breeding bird atlas is relatively straightforward. First, overlay a geographic area, often a state, with a uniform map grid. In Maryland and DC, each single grid unit, or block, is 1/6 of a United States Geological Survey 7.5-minute quadrangle map (Figure 1). Each of these blocks is approximately 10 square miles (roughly 3 x 3 miles). Second, recruit volunteer atlasers to survey each block over a five-year period. Third, provide the atlasers with a standard set of breeding evidence codes to report their observations in each block they cover. These breeding evidence codes are grouped into four broad breeding status categories: *Observed*, for birds seen out of season or habitat; *Possible*, for birds in appropriate habitat and season but showing no obvious nesting behavior; *Probable*, for birds showing behaviors implying they intend to nest or may be nesting; and finally *Confirmed*, for birds showing strong

evidence of nesting. Not all confirmations require finding nests or young birds; strong circumstantial evidence is often sufficient.
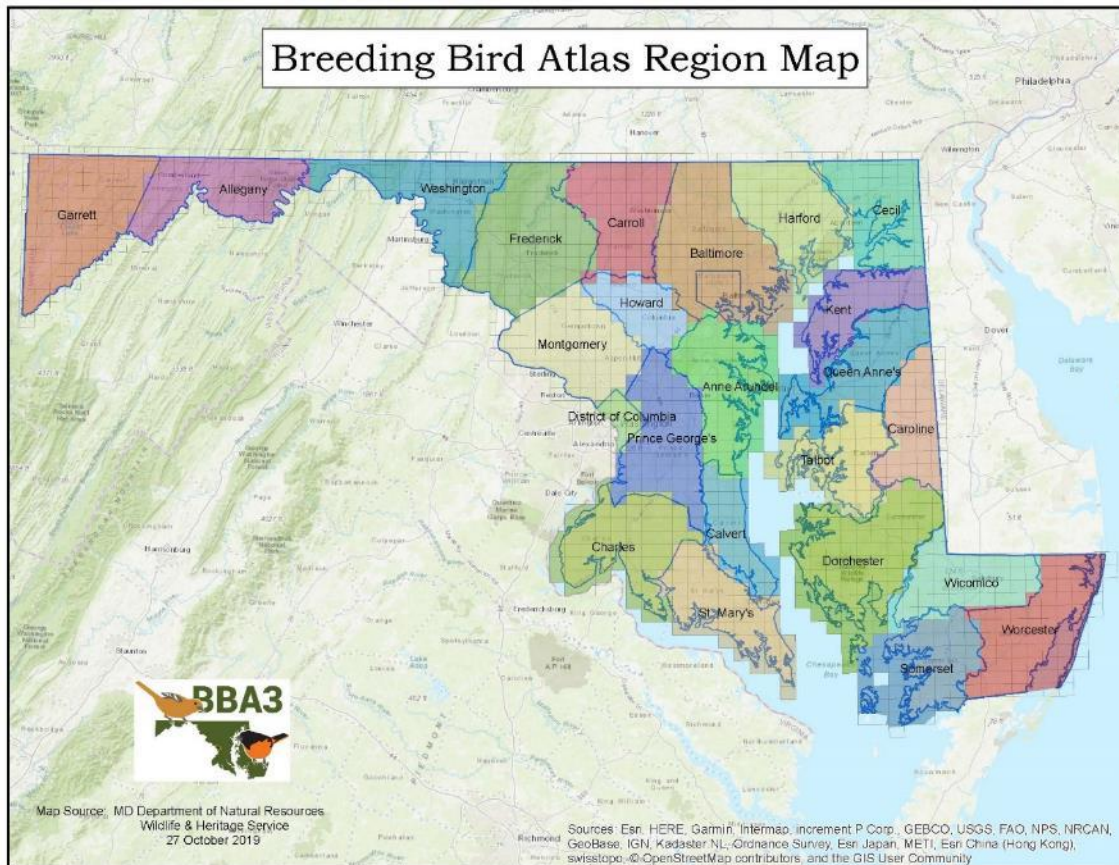

Figure 2: Maryland-DC block map color-coded by region.

This atlas, running from 2020 to 2024, is intended to map the nesting birds of Maryland and DC for a third time, building on previous atlases that ran from 1983 to 1987 and again from 2002 to 2006. It will use essentially the same block grid of 1,302 units (Figure 2) and a slightly revised set of breeding codes. Observations will be collected and entered online in a Maryland and DC Atlas eBird database. County Coordinators will encourage local observers to adopt atlas blocks and help oversee progress over the five-year project lifetime. Atlasing takes birding to another level as observers learn more about bird behavior and habitats, explore new places, meet new people, and contribute to knowledge about the region's birdlife.

Safety Tips

Your safety should be your primary consideration at all times. Always be sure to let someone know where you are atlasing, how to contact you, and how long you will be gone. If you will be going into a remote area, consider going with a partner or in a small group. Make sure your phone is charged and you have a charger, but remember service is not available in all locations. A GPS with spare batteries is great for safety, particularly in remote, off-road regions, but it is also excellent for recording locations of birds. A hand-held compass is a good back-up. While atlasing, consider putting an Atlas sign in your vehicle window (found on the website; ebird.org/about/handbooks-maps-forms). When atlasing from your vehicle, always check for other vehicles before stopping and be sure your attention is on the road, not the birds. When stopping, please do so with safety in mind (*e.g.*, pulling off completely onto a firm shoulder, not stopping in blind sections of the road, using your hazard lights). If you will be out in the evening or at night, bring a flashlight or headlamp with you, and extra batteries. You may also want to wear a reflective vest if you will be near a road.

Always be aware of weather conditions; check the forecast before you go out and be sure you are dressed appropriately, particularly if you are heading off-road. Bring plenty of water and food, and have access to a fully-stocked first-aid kit. The greatest environmental hazard for atlasers is heat stroke, so remember to drink the water you bring and to wear a hat.

Be aware of ticks; check yourself after each outing, especially from late spring to early fall. To help avoid tick bites, wear light-colored pants and long-sleeved shirts, and tuck your pants into your socks and your shirt into your pants, and use 20-50% DEET insect repellent on clothes and exposed skin. You should consider other recommendations from the Center for Disease Control (cdc.gov/ticks/avoid/on_people.html), including treating your clothing or using other EPA-registered insect repellents.

Tucking your pants into your socks will also help prevent rashes from plants like poison ivy and sumac. Be sure you know how to identify these plants and avoid touching

them; staying on trails is the best method to avoid them, but be especially aware of trail edges.

If you are heading out on the water, have a life jacket for each person, a whistle, a waterproof flashlight with fresh batteries, a paddle, and a bailing can with you.

Remember, you are fully responsible for your own safety and for personal insurance. Don't take chances; be safe.

Atlasing Methods

The data collection process for BBA3 is different than previous MD-DC atlases, so please read these instructions carefully.

Before beginning atlasing, it is important to have a good understanding of the data collection process. Collecting data for the Atlas is something that anyone, whether expert or novice, can contribute to, but neither expert nor novice will collect high-quality data without knowledge of the methods. The methods we have outlined allow us to collect data that will improve our knowledge of bird distribution, community composition, and habitat associations. The methods also allow us to correct for biases that are inherent in biological data collection. By closely following the recommended practices, you will be providing the Atlas with the highest quality data and allowing us to draw stronger, more useful inferences about the region's bird populations. If you have questions about any of the methods, contact your County Coordinator (Table 6).

In previous atlases, the highest breeding code was collected for each block for each species. Once a species was confirmed breeding, atlasers did not need to record it again. Now, the use of eBird for this atlas allows the collection of data throughout the entire atlas period and these data are associated with much more precise locations than a block or even a quarter-block. This means it is important to code each species you see each time you see it. These data will show changes in the timing of breeding (*i.e.,* reproductive phenology) more clearly at both patch and landscape scales.

If you are a new atlaser who is nervous or unsure of the methods, consider teaming up with someone experienced. Contact your region's County Coordinator (Table 6) and ask them to put you in touch with an experienced atlaser.

The first step in atlasing is to determine where you want to atlas. Look at the Atlas map available on the Atlas website and prioritize blocks that have low observer effort. You can atlas anywhere, anytime, but it is recommended that you focus on blocks that haven't been atlased a lot yet. You should also consider signing up for at least one block as its primary atlaser. Becoming a block's primary atlaser does not mean you will be its only atlaser; instead, it means you will make sure the block's completion targets (page 27) are met by the end of the Atlas. Signing up for a block also helps County Coordinators ensure uniform coverage across the state. As you are planning your next outing, remember that it is more important that the entire region receive uniform coverage than that your favorite location has the most impressive list.

Next, print or download the appropriate maps, lists, and files. You can find all of these, including PDF, KMZ, and GPX maps, online at the Atlas website (ebird.org/atlasmddc/about/handbooks-maps-forms). You can also find a field version of this handbook that has safe dates, breeding codes, and other useful references. Using eBird for data entry means that everything can be done electronically, but it's often handy to be able to mark a location on a paper map, double-check a breeding code, and have a back-up option if your phone battery dies.

Familiarize yourself with the block you intend to atlas. If there is private land on that block and you would like access, contact the landowner ahead of time (see land access on page 38). Know where different habitats are; use Google Earth (google.com/earth/) or the 'satellite' view on Google Maps (google.com/maps) to look for habitats such as forests, wetlands, agricultural, or urban areas. Other online mapping tools include MDMerlin.net (gisapps.dnr.state.md.us/MERLIN/index.html) to look for public lands and landowner names and addresses. You may even want to map out a route to visit sites efficiently or do a reconnaissance visit early in the season.

Familiarize yourself with the species you are likely to find in your block, their songs and calls, behaviors associated with breeding (Table 3), and their safe dates (Table 4, page 21). Block species lists can be found on the Atlas website (ebird.org/atlasmddc/about/handbooks-maps-forms), or at the USGS BBA Explorer tool (pwrc.usgs.gov/bba/). eBird's Merlin app can help you narrow down bird identification, the Macaulay Library (macaulaylibrary.org) and xeno-canto (xeno-canto.org) have outstanding collections of bird recordings, and there are websites and apps available to help learn bird vocalizations, such as Dendroica (natureinstruct.org/dendroica/) or the Larkwire app.

You should also be aware that some species are not always separable in the field. For example, Fish Crow and American Crow cannot be reliably separated except by voice. If you observe a crow and it does not call, you should record it as a 'crow sp.'.

Begin atlasing! This is the most exciting part. Atlasing isn't all that different from general birding, except that you are also watching for and recording bird behaviors that are evidence of breeding in your block. These behaviors are coded in eBird (see Table 3) and increase in order of the strength of evidence. For instance, a male bird that is singing (code S) could be breeding, but lots of birds do that even when they're migrating; he might not even have a mate. But if you see a male-female pair (code P), now you know they're probably breeding. And if you see that pair feeding chicks in a nest (code NY), then you know they are definitely breeding and have confirmed that species in your block.

Remember, the Atlas is linking the bird's behavior to their location, so it's important to only record breeding evidence if a bird is likely to be breeding in your block. For example, Turkey Vultures travel a considerable distance to forage. A Turkey Vulture you find soaring above a forest might be nesting several miles away and outside of your block. Recording it as in appropriate habitat (code H) would indicate possible breeding, but would be misleading for that block—even if the bird itself is possibly breeding.

Keeping that in mind, the distance traveled for each checklist you submit to eBird should be kept short, preferably no longer than three miles. Creating multiple short checklists rather than one long checklist while atlasing will provide better and more precise location data for the Atlas. In previous atlases, 'quarter-blocks' were used to obtain this information. In BBA3, there will be no quarter-blocks because each checklist is associated with a precise location. If you are doubling back on your track (*e.g.*, you reached the end of a one-way trail), only record the one-way distance and don't recount birds on your return trip. Ideally, each checklist will also be limited to a single major habitat type when possible. For instance, if you bird a park with a forest trail and a wetland, you would create two checklists: one for while you are walking the trail, and one for while you are at the wetland. Consider keeping a separate checklist for a particular state property, local park, or other conservation land or greenspace. This will make the data you collect even more useful for bird conservation and land management. Additionally, no checklist should cross a block's boundary. Keep these boundaries in mind, and create a new checklist if you do cross a block boundary.

For blocks along Maryland's state boundaries, **only checklists from within Maryland and DC will count towards the Atlas.** In the past, the entire block has counted toward the Atlas, but this has changed for BBA3 and now the state boundaries define where blocks end. We also strongly discourage using the 'select entire atlas block' option available for data entry, unless, of course, you did not record a precise location or if you are submitting an observation of a Northern Goshawk, Swainson's Warbler or a rare owl (see Species of Special Interest on page 33 for more information).

When you make your list, you must submit the data through the MD-DC Atlas eBird portal and you need to record the precise location, the date, the start and end times, how many people were birding with you, and, of course, the birds you saw and what breeding evidence you observed. If you use the eBird mobile app (which we recommend) most of this is recorded automatically for you. If you choose to keep track the traditional way, with a pen and paper, you can still enter it later on your computer;

just make sure you have the needed information written down for each checklist you make.

On each checklist, there are two different kinds of comment boxes available. The first comment box is for the entire checklist; use this box to record comments on where you went, who was with you, or what the weather was like. The second is for each species you see; use this box to record details on a bird's behavior, habitat, or how you identified it. The checklist comment box is for details relating to the entire checklist, and the species comment box is for details relating to that species. If you are submitting details for any of the species of special interest (Table 5), use the species comment box.

When possible, make the effort to submit complete checklists. A complete checklist is one that includes every bird you were able to identify (this includes 'common' species like pigeons and starlings). An incomplete checklist is acceptable for quickly recording a noteworthy species (*e.g.*, while driving, seeing a Cooper's Hawk fly over the highway into suitable nesting habitat), but complete checklists should be submitted whenever possible. Complete checklists are much more useful in data analyses than incomplete checklists.

Another important consideration is timing of atlasing, both throughout the year and throughout the day. Safe dates have been provided to help guide your efforts to find breeding evidence for each species. If you observe strong breeding evidence (*e.g.*, nest building, code NB) outside of the safe dates, it should still be recorded. However, weak breeding evidence (*i.e.*, any Possible status breeding code), should not be. The peak season for most birds is April through June, so this is when you will want to focus your atlasing efforts. Keep in mind that there are other species that nest at unusual times; for example, American Goldfinches don't begin nesting until June, while Great Horned Owls start in December.

Throughout the day, birds are most active from an hour before sunrise until mid-morning. This is the most valuable time to be looking for breeding evidence, and when

you will detect the most birds. But some birds, such as owls and nightjars, are much more likely to be detected at night. You should plan to spend at least one to two nights in each block within the appropriate dates listening for these birds. You can find out more about atlasing at night under the nocturnal atlasing guidelines (page 26).

Table 3. Breeding evidence codes.

Code	Behavior	Definition
Status: Observed		
(Blank)	Not breeding	If a bird is outside of its breeding season or not displaying any behavior indicative of breeding, do not apply a breeding code. Leaving the breeding code blank automatically assigns it 'Observed' status, and no further action is required. Please note that unlike the previous atlases, there is no 'Observed' *code*, only an 'Observed' *status*.
F	Flying over only	This is not necessarily a breeding code, but can be a useful behavioral distinction. Do not use this code for any flying bird. Instead, only use this code when a bird is not using the habitat, as described the article "Using the 'Flyover' code" in eBird ([help.ebird.org/customer/portal/articles/1736559)](http://help.ebird.org/customer/portal/articles/1736559).
Status: Possible (do not use outside of safe dates)		
H	In suitable habitat	Adult in suitable nesting habitat during its breeding season.
S	Singing male	Singing male present in suitable nesting habitat during its breeding season.

		Status: Probable	
S7	Singing male present 7+ days	Use only if you have observed a singing male at the exact spot (likely to be the same individual) one week or more earlier in the season. Do not use if you have observed a singing male a week earlier elsewhere on the same transect covered by your checklist.
M	Multiple (7+) singing males	At least 7 singing males present in suitable nesting habitat in the same block on the same day during its breeding season.
P	Pair in suitable habitat	Male-female pair observed in suitable nesting habitat during their breeding season.
T	Territorial defense	Permanent territory presumed through defense of breeding territory by fighting or chasing individuals of the same species.
C	Courtship, display, or copulation	Courtship or copulation observed, including displays and courtship feeding.
N	Visiting probable nest site	Visiting a probable nest site (primarily hole nesters).
A	Agitated behavior	Agitated behavior or anxiety calls from an adult. This does not include responses elicited by "pishing" or playing recordings, or mobbing behavior that species engage in year-round (*e.g.*, mobbing an owl).

B	Wren/ woodpecker nest building	Wrens and woodpeckers may build dummy nests or roost holes and thus nest-building behavior cannot be considered confirmation. Use this code in those cases.
PE	Physiological evidence	Physiological evidence of nesting, usually a brood patch. This will be used primarily by bird banders.
Status: Confirmed		
CN	Carrying nesting material	Adult carrying nesting materials; nest site not seen.
NB	Nest building	Nest building at apparent nest site (should not be used for wrens and woodpeckers that build dummy nests; see code B for these species).
DD	Distraction display	Distraction display, including feigning injury.
UN	Used nest	Nest is present but not active. Use only if you are certain of the species that built the nest. Use 0 to describe the number of birds if none were seen.
ON	Occupied nest	Occupied nest presumed by parent entering and remaining, exchanging incubation duties, etc.
FL	Recently fledged young	Recently fledged or downy young observed while still dependent on adults.
CF	Carrying food	Adult carrying food for young (should not be used for corvids, raptors, terns, and other species that may move many miles from the nest site; often supersedes code FL)

FY	Feeding young	Adult feeding young that have left the nest, but are not yet flying and independent (should not be used with raptors, terns, and other species that may move many miles from the nest site; often supersedes code FL).
FS	Carrying fecal sac	Adult carrying fecal sac.
NE	Nest with eggs	Nest with eggs.
NY	Nest with young	Nest with young seen or heard.

Safe Dates

Each bird population has a general range of dates in which nesting typically occurs that is determined by their physiology (or how their body operates), food availability, and migration route. Many species both breed in and migrate through the same region. For example, Eastern Wood-Pewees tend to arrive on the mid-Atlantic coast in early May, but many continue moving further north. This means an atlaser who detects a pewee in May doesn't know if the bird is a migrant or a breeder without further evidence. It is important the Atlas only receive records of breeding individuals, so potential migrants should be excluded from the Atlas dataset. This means atlasers should be conservative when using breeding codes during a species' migratory period. To help with this, we have provided a range of dates that indicate when it is 'safe' to use breeding codes that are based on relatively weak evidence, such as code H (habitat) or code S (singing). Outside of the safe date range for each species, you should only record Probable or Confirmed status breeding codes. **Do not record Possible status codes outside of safe dates**.

Table 4. A range of dates for each species when it is acceptable to use Possible status breeding codes. If you find a species breeding that does not have a safe date listed, please contact your County Coordinator.

Species	Start	End	Species	Start	End
Canada Goose	5 / 10	7 / 31	Black Rail	5 / 1	8 / 15
Mute Swan	5 / 1	8 / 31	Black-necked Stilt	5 / 15	7 / 15
Wood Duck	4 / 20	8 / 15	American Oystercatcher	5 / 15	7 / 25
Blue-winged Teal	6 / 5	7 / 5	Piping Plover	5 / 15	7 / 20
Gadwall	5 / 20	8 / 20	Killdeer	4 / 20	6 / 25
Mallard	5 / 15	8 / 20	Upland Sandpiper	5 / 20	6 / 25
American Black Duck	5 / 20	7 / 31	American Woodcock	4 / 15	8 / 31
Green-winged Teal	6 / 1	6 / 30	Wilson's Snipe	6 / 1	7 / 15
Ring-necked Duck	5 / 20	8 / 15	Spotted Sandpiper	6 / 10	6 / 30
Hooded Merganser	5 / 20	8 / 31	Willet	6 / 10	7 / 1
Common Merganser	5 / 20	7 / 30	Laughing Gull	6 / 5	7 / 10
Ruddy Duck	6 / 10	8 / 25	Herring Gull	6 / 5	7 / 10
Northern Bobwhite	4 / 15	9 / 30	Great Black-backed Gull	6 / 5	7 / 10
Ring-necked Pheasant	4 / 15	9 / 30	Least Tern	5 / 25	7 / 5
Ruffed Grouse	4 / 1	9 / 30	Gull-billed Tern	5 / 15	7 / 5
Wild Turkey	4 / 15	9 / 30	Common Tern	6 / 5	6 / 30
Pied-billed Grebe	5 / 20	7 / 10	Forster's Tern	5 / 15	6 / 25
Rock Pigeon	1 / 1	12 / 31	Royal Tern	5 / 25	7 / 5
Eurasian Collared-Dove	6 / 1	7 / 30	Black Skimmer	5 / 25	7 / 5
Mourning Dove	4 / 15	7 / 20	Double-crested Cormorant	6 / 10	6 / 30
Yellow-billed Cuckoo	6 / 15	7 / 31	Brown Pelican	6 / 1	7 / 31
Black-billed Cuckoo	6 / 20	7 / 20	American Bittern	6 / 1	7 / 10
Common Nighthawk	6 / 5	7 / 15	Least Bittern	5 / 20	7 / 31
Chuck-will's-widow	5 / 15	8 / 10	Great Blue Heron	5 / 15	6 / 30
Eastern Whip-poor-will	5 / 10	7 / 15	Great Egret	5 / 20	6 / 20
Chimney Swift	5 / 15	8 / 10	Snowy Egret	5 / 20	6 / 30
Ruby-throated Hummingbird	5 / 15	7 / 20	Little Blue Heron	5 / 20	6 / 20
King Rail	5 / 1	8 / 31	Tricolored Heron	5 / 20	6 / 30
Clapper Rail	5 / 1	8 / 31	Cattle Egret	5 / 20	6 / 20
Virginia Rail	5 / 20	8 / 15	Green Heron	5 / 1	7 / 15
Sora	6 / 1	7 / 31	Black-crowned Night-Heron	5 / 10	6 / 30
Common Gallinule	5 / 20	8 / 31	Yellow-crowned Night-Heron	4 / 20	6 / 30
American Coot	6 / 10	8 / 25	White Ibis	5 / 20	6 / 15
Purple Gallinule	6 / 20	7 / 31	Glossy Ibis	6 / 1	6 / 30

Species	Start	End	Species	Start	End
Black Vulture	5 / 1	7 / 31	Yellow-throated Vireo	5 / 25	8 / 15
Turkey Vulture	5 / 15	8 / 20	Blue-headed Vireo	6 / 1	8 / 20
Osprey	6 / 1	8 / 15	Warbling Vireo	6 / 1	8 / 10
Mississippi Kite	6 / 10	7 / 31	Red-eyed Vireo	6 / 1	7 / 31
Northern Harrier	5 / 20	7 / 25	Loggerhead Shrike	5 / 10	7 / 20
Sharp-shinned Hawk	6 / 1	7 / 31	Blue Jay	5 / 25	9 / 5
Cooper's Hawk	5 / 20	7 / 31	American Crow	4 / 20	8 / 31
Northern Goshawk	4 / 15	8 / 31	Fish Crow	5 / 10	8 / 31
Bald Eagle	4 / 15	8 / 5	Common Raven	4 / 1	7 / 31
Red-shouldered Hawk	5 / 10	8 / 20	Carolina Chickadee	3 / 1	8 / 31
Broad-winged Hawk	6 / 15	8 / 10	Black-capped Chickadee	5 / 1	9 / 20
Red-tailed Hawk	5 / 10	8 / 20	Tufted Titmouse	3 / 1	8 / 31
Barn Owl	4 / 15	9 / 30	Horned Lark	4 / 10	9 / 5
Eastern Screech-Owl	4 / 1	8 / 15	N. Rough-winged Swallow	5 / 25	6 / 20
Great Horned Owl	12 / 15	8 / 15	Purple Martin	6 / 1	6 / 25
Barred Owl	1 / 15	8 / 15	Tree Swallow	5 / 25	6 / 25
Long-eared Owl	5 / 1	9 / 30	Bank Swallow	6 / 1	6 / 20
Short-eared Owl	5 / 1	9 / 30	Barn Swallow	5 / 25	6 / 25
Northern Saw-whet Owl	5 / 5	9 / 10	Cliff Swallow	6 / 1	6 / 25
Belted Kingfisher	4 / 10	7 / 20	Golden-crowned Kinglet	5 / 20	9 / 10
Yellow-bellied Sapsucker	5 / 20	8 / 31	Red-breasted Nuthatch	6 / 1	7 / 20
Red-headed Woodpecker	5 / 25	8 / 20	White-breasted Nuthatch	5 / 10	8 / 15
Red-bellied Woodpecker	3 / 15	8 / 31	Brown-headed Nuthatch	3 / 20	8 / 15
Downy Woodpecker	3 / 15	8 / 31	Brown Creeper	5 / 15	8 / 31
Hairy Woodpecker	3 / 15	8 / 31	Blue-gray Gnatcatcher	5 / 15	7 / 31
Pileated Woodpecker	3 / 15	8 / 31	House Wren	5 / 20	8 / 15
Northern Flicker	5 / 10	8 / 25	Winter Wren	5 / 20	8 / 31
American Kestrel	5 / 15	7 / 15	Sedge Wren	6 / 10	8 / 31
Peregrine Falcon	5 / 20	8 / 15	Marsh Wren	5 / 25	8 / 25
Monk Parakeet	6 / 1	7 / 30	Carolina Wren	3 / 1	9 / 30
Eastern Wood-Pewee	6 / 1	8 / 15	European Starling	4 / 1	7 / 31
Acadian Flycatcher	5 / 25	8 / 5	Gray Catbird	5 / 25	8 / 31
Alder Flycatcher	6 / 10	7 / 20	Brown Thrasher	5 / 15	8 / 31
Willow Flycatcher	6 / 10	7 / 20	Northern Mockingbird	4 / 1	9 / 10
Least Flycatcher	6 / 5	7 / 20	Eastern Bluebird	5 / 1	8 / 31
Eastern Phoebe	5 / 1	8 / 31	Veery	6 / 10	8 / 10
Great Crested Flycatcher	5 / 25	7 / 31	Hermit Thrush	5 / 25	9 / 15
Eastern Kingbird	5 / 25	7 / 5	Wood Thrush	5 / 25	8 / 20
White-eyed Vireo	5 / 25	8 / 15	American Robin	5 / 1	7 / 31

Species	Start	End	Species	Start	End
Cedar Waxwing	6 / 15	7 / 31	Northern Waterthrush	6 / 5	7 / 15
House Sparrow	2 / 1	8 / 31	Golden-winged Warbler	5 / 25	7 / 20
House Finch	5 / 1	7 / 15	Blue-winged Warbler	5 / 25	7 / 20
Purple Finch	6 / 1	8 / 10	Black-and-white Warbler	5 / 15	7 / 25
Red Crossbill	4 / 1	8 / 31	Prothonotary Warbler	5 / 10	7 / 20
Pine Siskin	5 / 20	8 / 31	Swainson's Warbler	4 / 20	8 / 31
American Goldfinch	6 / 15	8 / 31	Nashville Warbler	5 / 25	8 / 15
Grasshopper Sparrow	5 / 25	8 / 31	Mourning Warbler	6 / 15	7 / 31
Chipping Sparrow	5 / 1	8 / 31	Kentucky Warbler	5 / 25	7 / 15
Clay-colored Sparrow	6 / 1	7 / 31	Common Yellowthroat	5 / 25	8 / 10
Field Sparrow	5 / 1	8 / 31	Hooded Warbler	5 / 25	7 / 25
Dark-eyed Junco	6 / 1	7 / 31	American Redstart	6 / 10	7 / 20
White-throated Sparrow	6 / 10	7 / 31	Cerulean Warbler	5 / 25	8 / 5
Vesper Sparrow	5 / 15	8 / 31	Northern Parula	6 / 1	8 / 15
Seaside Sparrow	6 / 1	8 / 10	Magnolia Warbler	6 / 10	8 / 5
Saltmarsh Sparrow	6 / 1	8 / 10	Blackburnian Warbler	6 / 10	7 / 31
Savannah Sparrow	6 / 5	8 / 10	Yellow Warbler	6 / 1	7 / 10
Henslow's Sparrow	5 / 15	8 / 31	Chestnut-sided Warbler	6 / 1	8 / 10
Song Sparrow	5 / 1	7 / 31	Black-throated Blue Warbler	6 / 5	8 / 5
Swamp Sparrow	6 / 1	7 / 31	Pine Warbler	4 / 25	8 / 10
Eastern Towhee	5 / 20	8 / 31	Yellow-rumped Warbler	6 / 1	8 / 20
Yellow-breasted Chat	5 / 25	8 / 5	Yellow-throated Warbler	5 / 1	7 / 15
Bobolink	6 / 5	6 / 30	Prairie Warbler	5 / 25	7 / 20
Eastern Meadowlark	4 / 25	9 / 10	Black-throated Green Warbler	6 / 10	8 / 5
Orchard Oriole	6 / 1	7 / 5	Canada Warbler	6 / 10	7 / 15
Baltimore Oriole	6 / 1	7 / 25	Summer Tanager	6 / 5	8 / 10
Red-winged Blackbird	5 / 1	7 / 10	Scarlet Tanager	5 / 25	8 / 10
Brown-headed Cowbird	5 / 1	7 / 10	Northern Cardinal	3 / 15	9 / 30
Common Grackle	4 / 15	6 / 30	Rose-breasted Grosbeak	6 / 15	8 / 10
Boat-tailed Grackle	4 / 15	8 / 31	Blue Grosbeak	6 / 5	8 / 10
Ovenbird	5 / 20	8 / 5	Indigo Bunting	5 / 25	8 / 15
Worm-eating Warbler	5 / 20	7 / 20	Dickcissel	6 / 5	8 / 10
Louisiana Waterthrush	5 / 1	7 / 10			

Seasonal Coverage

To ensure adequate coverage in your block, we recommend you follow a schedule resembling the one outlined here (although keep in mind this will vary somewhat depending on where in the region you are):

January–April – begin searching for Great Horned and Barred Owls. When you find owls, record their precise location so you can return a week or so later and upgrade their breeding status. Other owls will begin calling in March, April, and May; early spring nights will be the best time to find these species. Many resident songbirds will begin setting up territory in March.

May – by mid-May, most birds have already set up territories and are singing. Trips to your block beginning early in the morning will be the best way to detect these birds. Record precise locations for each singing species so that you can return a week or so later and upgrade their breeding status.

June – some species, most notably the American Goldfinch and the Cedar Waxwing, don't begin nesting until June. An early summer trip to your block will help you record their breeding, as well as offer an opportunity to upgrade species you detected earlier. For example, this is a great time of year to find recently fledged young—a Confirmed status breeding code.

You will also want to make a nocturnal trip in late spring or early summer to detect nightjars and marsh birds. This is best timed when the moon is visible in the sky at night and it is at least half-full, when nightjars call most frequently.

July–December – by mid-summer many species have stopped or slowed singing, but nesting may still be ongoing. It may take more effort to upgrade breeding codes, but many species will be raising a second brood or re-nesting after a failed first clutch. You will also still be able to find recently fledged young of many species, including goldfinches and waxwings. Nesting will continue into September for some species, but by October breeding efforts are complete. Exceptions exist for Rock Pigeons, a year-

round nester, Great Horned Owls, which begin calling once again in December, and Bald Eagles, which may start nest building in late fall.

Nocturnal Atlasing Guidelines

Some species, such as owls, nightjars, rails, bitterns, and woodcock, are cryptic species during the day. However, they vocalize or display at night and are best detected then. Ideally, each block should receive at least two nocturnal visits, one in early spring (for owls and woodcock) and one in late spring or early summer (for nightjars and other species), and each visit should be at least 1–2 hours long. Call playback is acceptable for nocturnal atlasing, but should not be overused. If possible, avoid atlasing on nights with strong winds (more than 10 mph), complete overcast, or rain.

A nocturnal trip's success is largely dependent on its timing. May and June are the best months to listen for rails and nightjars, and nightjars will be most active on nights with a visible, at least half-full moon. Nighthawks do not begin nesting until June, but their territorial diving display is performed in the evening before it truly gets dark. American Woodcock, Barn Owls, and Eastern Screech Owls begin nesting in April. The best way to find Barn Owls is often to talk to landowners with barns on their properties; they will likely know if a Barn Owl is nesting there. Long-eared, Short-eared, and Northern Saw-whet Owls don't begin breeding until May, while Great Horned and Barred Owls are already calling in mid-winter.

Call playback is encouraged for nocturnal atlasing of owls, rails, and bitterns, but **not** for regular atlasing. Calls and songs can be found at the Macaulay Library (macaulaylibrary.org) and xeno-canto (xeno-canto.org). Pairing a smartphone and a speaker will provide good results. When employing playback to detect owls, always play calls in the sequence of smallest species to largest species with five-minute intervals between species. For example, play saw-whet, then screech owl, then barred, then Great Horned Owl. Since larger owls will prey on smaller owls, this method increases detection rates of smaller owls. If a smaller owl responds, move to another location to avoid attracting larger owls. Finally, remember that playback is disruptive to a bird's

behavior. Avoid prolonged bouts of playback—no more than two minutes of playback per species at each stop. If you are atlasing at night, please submit checklists for all of your effort, including checklists with no species.

Safety awareness is even more important in the dark. Always use your hazard lights when your vehicle is stopped and never stop in a blind section of the road where traffic cannot see you well in advance, most notably curves and hills. Give traffic plenty of room for other drivers to detect you. We recommend you wear reflective and/or high-visibility clothing and avoid dark clothing. Be sure to let someone know where you are going and when you will be returning, and, if possible, travel with a partner.

Upgrading Breeding Codes

Unlike a typical bird list, simply recording a species at a location is not the final step. Breeding evidence also needs to be recorded for each species, and the status of that evidence has a hierarchy of four different confidence levels: Observed, Possible, Probable, and Confirmed. Upgrading the breeding status for a species from one confidence level to a higher confidence level is an important part of the atlasing process.

Observed – non-breeding species (such as a migrating Sanderling) will only ever receive Observed status. This is the default status for each species, and you do not need to select it; **a blank breeding code equals an Observed status**. In fact, the only code that falls under this status is code F = flyover, which has special restrictions associated with it. Code F is only to be used for species that are not using the habitat below them. For example, a Red-tailed Hawk soaring over a field would not be a code F because it is foraging over the field, while a Great Blue Heron flying across the highway would be, because it is probably travelling between foraging sites. This code is used by eBird to distinguish birds not using a particular habitat from those using the habitat, so code F should be used sparingly and deliberately. You can read more about code F in the article "Using the 'Flyover' code" in eBird (help.ebird.org/customer/portal/articles/1736559).

Possible – this is the lowest breeding evidence status, and essentially only indicates a bird was present during the breeding season. Possible codes cannot be used outside of a species' safe dates. A block should have no more than 25% Possible codes; most can be upgraded to Probable by making a note of the precise location a bird is singing from and revisiting those sites a week later. If the bird is still singing at that precise location a week or more later, it establishes territoriality and upgrades their status to Probable (code S7). It is important that the recorded location of the bird be precise; a Northern Parula singing at Jug Bay on two different weekends is not precise enough. However, a Northern Parula singing on two different weekends from the small woodlot northeast of the Jug Bay visitor's center would be. If you have access to one, a handheld GPS is ideal for recording these locations, but a notebook or the comment box in your eBird checklist are also good options.

Probable – most breeding behaviors that do not directly involve nests, chicks, or eggs indicate Probable breeding status. The majority of the species in your block will likely fall under this category, and that is okay. While confirming every species in a block would be great, it is also time consuming. Your atlasing efforts are better spent getting as many species as you can to Probable status, rather than finding nests or chicks. The best ways to upgrade birds to Probable status are to return a week after initially finding a singing male and find it singing from the same precise location (code S7) or to find a male-female pair of the same species (code P). Please note that this must be a male-female pair, not just a pair of birds.

Confirmed – confirmed breeding is the highest breeding status, but it can be time consuming to get. Some species are simple; a Canada Goose on a lake with goslings is immediately Confirmed (code FL), but a Common Nighthawk will likely remain Probable without a lot of searching (and potential disturbance). The easiest way to confirm breeding in your block is to watch for species that are carrying food to their chicks (code CF).

Block Completion Targets

One of the goals of the Atlas is that all atlas blocks receive uniform and sufficient coverage. One way to ensure this is to standardize, as much as possible, how sufficient coverage is defined. A set of block completion targets will be used as guidelines to help define when a block has been provided sufficient coverage. Once those targets have been met, you are encouraged to move on to a different block. While the entire set of six targets will be evaluated, the primary targets are more important to complete and will be given the most consideration when reviewing atlasing effort at the end of each season.

Primary Targets

Species – most blocks contain 90-100 breeding species, except for those in urban areas, agricultural areas, and 'edge' blocks containing mostly water or along the state border. Therefore, the general goal is to locate **at least 70 species** in rural blocks and 40 species in blocks with primarily urban or agricultural areas or blocks that are primarily water. Use the block species lists compiled by previous atlases as a guide for which species occur in a given block and try to find all of them. These lists can be found on the Atlas website (ebird.org/atlasmddc/about/handbooks-maps-forms). Special effort should be made to find species of special interest (page 33) listed on these block species lists.

Time – the minimum observer effort for each block is **20 hours**, but the emphasis should be on covering all habitats in the block thoroughly rather than just the number of hours involved.

Breeding status – because many species require hours of effort to confirm breeding, the emphasis is on raising all of the common species to at least Probable status. This means **a minimum of 25% Confirmed, 50% Probable, and a maximum of 25% Possible** breeding status in each block. Special effort should be made to Confirm rare, locally unexpected species, and species of special interest (page 33).

Secondary Targets

Nocturnal – because some widespread species (*e.g.*, owls, nightjars, and marsh birds) are most active at night (or at dawn and dusk), a **nocturnal visit of at least 1 hour** is highly recommended. Two visits of 2–3 hours would be preferred.

Habitats – coverage within a block should be dispersed to **cover all of the major habitat types** in each block that are available (*e.g.*, upland deciduous forest, grasslands, agricultural fields, forested wetlands, marshes).

Seasonality – coverage should be spread out such that **each block is visited throughout the breeding season**. Later in the season it is easier to confirm species, especially species that tend to breed later (*e.g.*, goldfinch).

Block Coverage and Observer Effort

Atlasing can happen in many ways: morning backyard checklists, weekend visits to local parks, or longer trips to new corners of the region. To help ensure adequate coverage across the region, you can sign up to become the 'primary atlaser' for one or more blocks. The primary atlaser is not the only person who will atlas a given block; **anyone can atlas any block at any time**. Instead, the primary atlaser is responsible for ensuring the block meets its completion targets by the end of the Atlas. To sign up for a block, contact the appropriate County Coordinator (Table 6). Feel free to request a particular block; if you would like to view block availability, we have an online block tool for that purpose (you can find the link for the tool on the Atlas website at ebird.org/atlasmddc/tips-links). This tool displays the block grid over various map backgrounds to help you decide which block you would like to adopt. It also includes links to downloadable block maps and block species lists. Blocks will be assigned to atlasers on a first-come, first-served basis.

Under its 'Explore' tab, eBird provides maps and outputs of observer effort, checklists, species, and breeding statuses at the block, county, and state levels. Map outputs can be displayed for any month or year time series. Using the data exploration features

available through eBird, you can determine which areas require more observer effort and focus your atlasing there. The area in question may be an entire block, or it may be a portion of a block (*e.g.*, a habitat type within a block that has not been atlased sufficiently). County Coordinators may contact atlasers to notify them of under-observed areas and to recommend changes in observer effort (*e.g.*, the current block has been completed, but a neighboring block requires additional atlasing).

Blockbusting trips are outings involving multiple observers over a short period of time to atlas blocks that have received low coverage. County Coordinators will arrange blockbusters, but you should feel free to coordinate your own trips as well. Blockbusting can provide you with exposure to new birds, new habitats, new locations, and new people, and it can be as much about the social component as it is about the birds.

Some counties have more observers than others and the blocks within those counties will reach their completion targets before other counties with fewer observers. Since one of the primary objectives of the Atlas is to provide uniform coverage of the state, we recommend that you begin atlasing other counties once your own county's completion targets have been reached. This inter-county cooperation will reduce the bias caused by uneven observer effort and increase the overall quality of data collected for the Atlas.

Nest Records

Atlasers are among the observers most likely to find bird nests, because they are watching birds at the right time and place specifically for breeding evidence. When you inevitably find a nest, not only have you confirmed breeding for that species, but you have the opportunity to record additional data beyond the details that should be entered into eBird as part of your checklist. We recommend that you use Cornell's NestWatch.org program.

When interacting with nests, please remember that with the opportunity for data collection comes the cost of disturbance; it is critical to a bird's nest success that

disturbance is avoided or at least minimized. Please take the time to review MOS's downloadable PDF guide to "Safe Observation of Nests" (ebird.org/atlasmddc/about/handbooks-maps-forms) and learn how to reduce nest disturbance so you are prepared when you do find a nest. It may also be beneficial to return to the nest site later to report its outcome. You can find out more about ethically following a nest's outcome, as well as submitting those data to Cornell's NestWatch.org program, on their website.

Documenting Species of Special Interest

If you find one of the species of special interest listed below in Table 5, please include additional details in the species comment box on your eBird checklist. This additional information will be used to better understand where these species are occurring and how to conserve those species and their habitats.

The list of special interest species includes two groups: the first is species at risk in Maryland (designated by MD DNR as S1 or S2)—these are species we are referring to as our priority species—and the second group is colonial species and Bald Eagle. For priority species, please include in your species comments a brief description of the habitat, a description of how you identified the bird, and details of any nests you find (*e.g.*, height above ground, species of tree/shrub, number of eggs/young present). If possible, a photo or audio file should be submitted as well. If you find a species that does not have safe dates listed (*i.e.*, a new or historical breeding species), please treat them as a priority species. For colonial species, when you find a colony please provide the location and number of nests. When you find a Bald Eagle nest, please provide the precise coordinates. In general, colonial species should only have a breeding code reported when you find a nest; otherwise their populations are likely to be overestimated because they are often seen in areas far from their breeding colonies. **If you have concerns about including the precise location in the comment box, please email the information to the appropriate County Coordinator with a link to the associated checklist**.

Many of these species are rare in Maryland and DC, so the checklist comment box may not be the most appropriate place for precise coordinates. But this is still valuable information, so instead, submit the checklist as normal, but follow-up with the County Coordinator and provide them the precise coordinates and a link to the associated checklist. Please do **not** manually hide the checklists in eBird. Hiding checklists will not only remove the checklists from public view, it will also remove the checklists from the Atlas database rendering the data you collected useless. If you would like to avoid an observation from being included in the eBird rare bird alerts (ebird.org/alerts), simply wait eight days before submitting your checklist.

Sensitive Species

Many of these species are conservation priorities because they are not only rare, but also sensitive to disturbance, and releasing location information could result in further disturbance. These **sensitive species include Northern Goshawk, Swainson's Warbler, and rare owls** (*i.e.*, Barn, Long-eared, Short-eared, and Northern Saw-whet Owl). If you find one of these six species, please contact either the County Coordinator or the Atlas Coordinator before submitting your checklist. They will advise you on the best way to submit your data and protect the bird.

Any species that does not have a safe date listed for it is either a new or a historical breeding species. If you find a species with no safe date listed, please contact either the County Coordinator or the Atlas Coordinator before submitting your checklist.

Please remember that disturbing a sensitive species' nest could cause them to abandon their breeding effort. **Avoid disturbance, including playback, to these species as much as possible.** Some of these species are listed by MD DNR as endangered or threatened. Excessive disturbance could be considered harassment, which is both unethical and illegal. Please refrain from posting locations of priority species to social media to limit potential disturbance.

Table 5. Species of special interest for which additional details are needed. Italics indicate species that are sensitive to disturbance. Contact the County Coordinator or the Atlas Coordinator before submitting sensitive species.

Colonial species and Bald Eagle (location and number of nests)		
Laughing Gull	Black Skimmer	Tricolored Heron
Least Tern	Brown Pelican	Black-cr. Night-heron
Gull-billed Tern	Great Blue Heron	Yellow-cr. Night-heron
Common Tern	Great Egret	Glossy Ibis
Forster's Tern	Snowy Egret	Bald Eagle
Royal Tern	Little Blue Heron	Bank Swallow

Priority species (identification, habitat, and nest details; email precise coordinates of bird to the County Coordinator)		
Blue-winged Teal	American Bittern	Loggerhead Shrike
Gadwall	Least Bittern	Winter Wren
Common Merganser	Northern Harrier	Sedge Wren
Pied-billed Grebe	Sharp-shinned Hawk	Pine Siskin
Common Nighthawk	*Northern Goshawk*	Saltmarsh Sparrow
King Rail	*Barn Owl*	Henslow's Sparrow
Sora	*Long-eared Owl*	Swamp Sparrow (Coastal Plain)
Black Rail	*Short-eared Owl*	Northern Waterthrush
Common Gallinule	*Northern Saw-whet Owl*	Golden-winged Warbler
American Oystercatcher	Yellow-bellied Sapsucker	*Swainson's Warbler*
Piping Plover	Peregrine Falcon	Nashville Warbler
Upland Sandpiper	Alder Flycatcher	Mourning Warbler

Abundance

Unlike previous atlases, eBird allows abundance data to be collected alongside breeding evidence. Although eBird allows the use of an 'X' instead of a number, we strongly discourage you from doing so. An 'X' indicates only presence or absence, but provides no information on the order of magnitude. Was there one Canada Goose, or 100? Precise counts of individuals are best, of course, but even a rough estimate is better

than no estimate. eBird has excellent articles available for estimating abundance (ebird.org/news/counting-101/ and [ebird.org/news/counting-201/)](ebird.org/news/counting-201/).

When observing multiple individuals of the same species, you will also observe different breeding evidence codes. Always **record the highest code you have observed on that checklist** (Figure 3). For example, if you hear a Pine Warbler at the start of your checklist, you can record one Pine Warbler, code S. Later on, during that same checklist, you see a Pine Warbler nearby carrying food. Now, you record two Pine Warblers, code CF. Then later, you hear another male singing, so you record three Pine Warblers, code CF. Remember, each checklist is independent of other checklists. So, if you start a new checklist later and hear another Pine Warbler singing, you would record one Pine Warbler, code S **regardless of what breeding codes you recorded on previous checklists** (exceptions exist for codes S7 and M, used for the same bird seen again after 7 days or multiple of the same species).

Of course, the times you have so many birds you need to estimate are the good times. Sometimes, despite your best efforts, there are no birds whatsoever to record! This is still valuable information, and we strongly encourage you to submit checklists with no birds entered when appropriate. There is a saying that, "no data are still data". In other words, zeroes, such as checklists with no birds, can tell you a lot about a particular place and time. On the other hand, a checklist that was never submitted because no birds were seen says nothing about a particular place and time. For example, imagine a wetland that no one has ever atlased. We don't know if it is overrun with birds, or if there are no birds at all. Now imagine you visit the wetland. Unfortunately, you find that there are no birds at all, and so you don't bother to make a checklist. You leave the wetland, and everyone else remains none the wiser about whether the wetland is overrun with birds or not!

Data Entry

We recommend you use the eBird mobile app to collect your atlas data. It records the distance you covered, how long you were atlasing, and the precise starting location for

each location without you needing to estimate. However, we also realize that some folks prefer the traditional approach of paper and pencil and entering into eBird later, so we have a downloadable block datasheet and some data entry tips for you.

First, enter your data soon after your atlas outing. Data entry is easier and most accurate when the event is still fresh in your mind, rather than weeks or months later. It also provides more follow-up opportunity for rare species you find, and makes sure other observers know an area has been covered so they don't unknowingly repeat your atlas efforts. Second, review the data you entered. Transcribing records increases the probability of an error. Reviewing entries helps minimize those errors. Finally, keep good notes while in the field. Record numbers of each species, what habitat you were in, what your route was (perhaps mark it on a printed block map), and comments on unusual species or behaviors. These notes can be useful for jogging your memory when you enter your data and provide valuable additional information on your sightings.
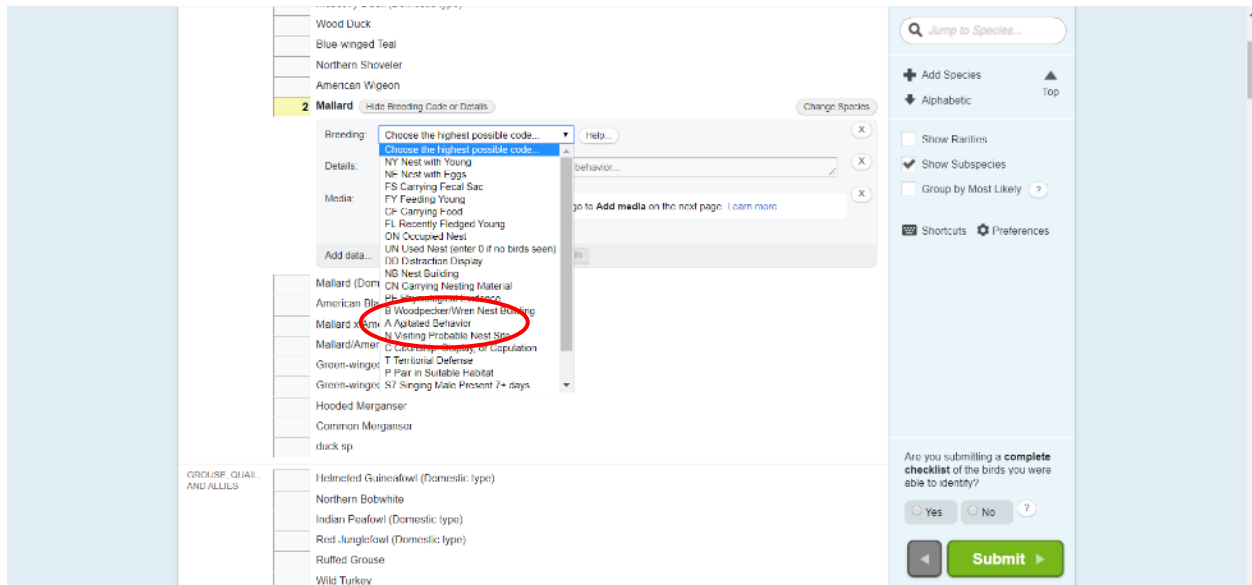
Figure 3. Only one code per species per checklist can be selected, so use the highest code you observed on that checklist.

The block data sheet, found on the Atlas website
(ebird.org/atlasmddc/about/handbooks-maps-forms) along with a completed example,

includes the most common breeding species in the Maryland and DC area. The datasheet is intended to be used for one checklist, so be sure to print off enough datasheets. If you would like assistance with printing datasheets, please contact the Atlas Coordinator. Please note, however, that **even if you choose to use this form in the field, the data must still be entered into eBird**. If you are unable to do so (*i.e.*, have no internet access), please contact your County Coordinator or the Atlas Coordinator (202-681-4733).

Atlas Ethics

Atlasing ethics can be summed up in two phrases: respect birds and respect people. To best respect birds, limit the use of playback or other methods to elicit responses or detections (unless you are following our nocturnal protocol (page 26). We understand that not all birds will be detected. To be comparable to each other, all observers need to use similar methods. If some decide that playback is acceptable and others do not, a strong detection bias will be introduced between observers. Playback is not only bad for birds, but also bad for this atlas. You may also come across species of special interest (Table 5) while atlasing. These should be reported to eBird with the details requested for reporting priority species (Table 5). Please refrain from posting locations of sensitive species (Table 5) to social media, review the guidelines for reporting sensitive species (page 33), and please avoid disturbing these species and their nests. Many of these species have a lower tolerance to human disturbance than other, more common birds.

Respecting habitat is an important part of respecting birds. Avoid trampling vegetation or disturbing streams and creeks. When you are in a group, be aware of the impact to the environment, the birds, and to other people.

Do not trespass on private property. Not only is this unethical and forms a poor perception of atlasers, it is also illegal. Ask landowners for permission (page 38) before entering private property and respect their wishes if they decline. Likewise, follow posted rules and guidelines when on public property. If an area's usage is restricted to trails, remain on the trails, even if there is a nest or an unidentified bird just out of

sight. Be respectful of other legal users of public lands, such as hikers, recreational vehicles, and hunters. Also, be aware that not all public lands are necessarily open to the public. You may need to contact the property manager for access to otherwise closed public lands, including access 'after hours' at night or early in the morning before it opens.

Finally, share your enthusiasm for atlasing! An objective of the Atlas is to encourage and develop enthusiasm for birds among the public. Be friendly, explain to interested folks what you are doing and why it is important, and let them know how they can get involved.

Land Access

Access to private land will be an important part of the Atlas, since less than 30% of the state is public land. If you can provide access permission, please contact the appropriate County Coordinator (Table 6). If you would like to atlas on private land, ask the landowner for permission. You can do this in person, or you can use the letter provided on the Atlas website (ebird.org/atlasmddc/about/handbooks-maps-forms). If the landowner declines, then be respectful of their wishes. If the landowner grants you access, let the Atlas Coordinator know (so the landowner can be acknowledged) and follow up with a thank-you letter after you have finished atlasing on their land. This letter could also include a list of birds you found on their land, their breeding status, and any noteworthy sightings. You can find landowner names, mailing addresses, and parcel boundaries on MDMerlin (gisapps.dnr.state.md.us/MERLIN/index.html). You can find instructions for using this map on the Atlas website (ebird.org/atlasmddc/about/handbooks-maps-forms).

If you submit a checklist from private land, a good practice is to include the word 'private' in the location title (*e.g.*, Smith Farm – private) so that other atlasers immediately know the location is on private land. If a landowner is concerned about their land being linked with a rare or endangered bird, or wishes for their land to be

unassociated with a checklist, you should respect their wishes. You can use the nearest road or other public location as your location instead.

If you are approached by someone while atlasing, it will often be a local who is interested in what you are doing and checking if you need help. Many people will enjoy talking with you about local birds once they know what you are doing, and this is a great opportunity to ask if they know of any nesting birds (especially Barn Owls) or if you can access their property. If they provide you with information about nesting birds, record the location they provide and their name so they can be acknowledged appropriately.

To access closed public land, contact the property manager. To access private land that is generally open to the public (*e.g.*, The Nature Conservancy, the Izaak Walton League), be sure that you are explicitly allowed access to the parcel in question. If access is unclear, contact the property manager.

Documenting Volunteer Time

The Atlas is funded, in part, by a federal grant from the U.S. Fish and Wildlife Service to the Maryland Department of Natural Resources (MD DNR). However, this funding is only provided if MD DNR can match it with state funds or volunteer time. **Every hour of your time that you are willing to document allows us to spend nearly $75 of federal funds.** These funds currently allow the employment of a full-time Atlas Coordinator. Additional funding will be needed for other aspects, such as targeted atlasing for species that are difficult to atlas, like marsh birds, or perhaps some reimbursement or incentive funds for blockbusting.

Two different forms for documenting your time are available on the Atlas website (ebird.org/atlasmddc/about/handbooks-maps-forms). The first is for a group of people attending an event, such as a training meeting. The second is for an individual to use throughout the season. The most important items to record on these forms are your name, date, time (in hours, rounded to the nearest 15 minutes) and your signature. On

the individual form, the "Comments" section is optional. Feel free to use this section as a log to remind you where you went or what you did throughout the year. **Live signatures are required**. Unfortunately, scanned versions of signed forms, certified "PDF signatures" or other forms of electronic signatures are not sufficient. They must be signed the old-fashioned way and the original paper form mailed to Lynn Davidson at MD DNR-WHS, 580 Taylor Ave E-1, Annapolis MD 21401. This address information is also provided on the bottom of each form. **Forms should be mailed quarterly** with deadlines of April 7, July 7, October 7, and January 7 (*e.g.*, all January–March forms should be mailed by April 7), but all forms must be mailed by **July 7** of that year.

Your time spent atlasing will be captured within eBird when you enter your data. You will be sent a form with your eBird checklist hours to sign and return to MD DNR. You don't need to record your eBird checklist time on a volunteer time form. Instead, you should document your time spent on Atlas-related activities, such as travel time to and from your atlasing location or atlas meetings, time researching landowner names and addresses, time corresponding with landowners and land managers to obtain access permission, and other tasks necessary for atlasing. If an event form has been used to capture your time at an atlas meeting, as well as your travel time to and from the meeting, then please **do not duplicate** this information on a personal volunteer time form.

Coordinator Contact Information

If you have any questions about where to go atlasing or how to do it, contact the County Coordinator for your region or the Atlas coordinator, Gabriel Foley.

Table 6. List of Coordinators and contact information.

Region	Coordinator	Contact
MD-DC BBA3	Gabriel Foley	mddcbba3@mdbirds.org
Allegany	Melissa Hensel	allegany@mdbirds.org

Region	Coordinator	Contact
	JB Churchill	
	Mark Eanes	
Anne Arundel	David Walbeck	annearundel@mdbirds.org
Baltimore	Paul Kreiss	baltimore@mdbirds.org
	Mike Hudson	
Caroline	Danny Poet	caroline@mdbirds.org
Carroll	David Smith	carroll@mdbirds.org
Calvert	Andy Brown	calvert@mdbirds.org
	Sherman Suter	
Cecil	Sean McCandless	cecil@mdbirds.org
Charles	Lynne Wheeler	charles@mdbirds.org
	Tom Seaton	
Dorchester	George Radcliffe	dorchester@mdbirds.org
Frederick	Kathy Calvert	frederick@mdbirds.org
Garrett	Connie Skipper	garrett@mdbirds.org
	Caroline Blizzard	
	Kevin Dodge	
Harford	Dennis Kirkwood	harford@mdbirds.org
	Matt Hafner	
Howard	Sue Muller	howard@mdbirds.org
	Dave Ziolkowski	

Region	Coordinator	Contact
Kent	Nancy Martin	kent@mdbirds.org
	Walter Ellison	
Montgomery	Emily Huang	montgomery@mdbirds.org
	Karen Cyr	
Prince Georges	Ross Geredien	princegeorges@mdbirds.org
	Dave Mozurkewich	
Queen Anne's	Glenn Therres	queenannes@mdbirds.org
St. Mary's	Tyler Bell	stmarys@mdbirds.org
	Matt Ichniowski	
Somerset	TBD	somerset@mdbirds.org
Talbot	Ron Ketter	talbot@mdbirds.org
Washington	Mark Abdy	washington@mdbirds.org
	Heather McSharry	
Wicomico	TBD	wicomico@mdbirds.org
Worcester	Mark Hoffman	worcester@mdbirds.org
	Dave Wilson	
Washington DC	Dan Rauch	washingtondc@mdbirds.org

Social Media

The Atlas has a presence on Facebook, Twitter, and Instagram (@mddcbba3 for all platforms), as well as a blog accessible through the Atlas eBird website. As a participant of the Atlas, we encourage you to submit content to the Atlas Coordinator for posting, especially region-specific content. This content can include nearly anything related to

the Atlas, atlasing, or birds including atlaser spotlights, stories from the field, or photos of birds or landscapes. You are also encouraged to work with your local bird club's social media to feature regional Atlas-related content. For any Atlas-related content you post, we encourage you to use the hashtag **#mddcbba3**.

Appendix A: Using eBird at a Desktop

All data submitted to the Atlas must go through the MD-DC BBA3 eBird portal—it's like submitting your data through a different atlas 'door' than eBird's 'main entrance'. If you have breeding evidence to submit, be sure to select the MD-DC BBA3 eBird 'door' by going to ebird.org/atlasmddc/home. Alternatively, if you have no breeding evidence in your checklist, submit that through the eBird 'main entrance' at ebird.org.

The first step to submitting data through eBird is to set up an account. Go to ebird.org/atlasmddc/home and click 'Create account'. Of course, if you already have an eBird account, simply go to the MD-DC BBA3 Atlas page (ebird.org/atlasmddc/home) and sign in.
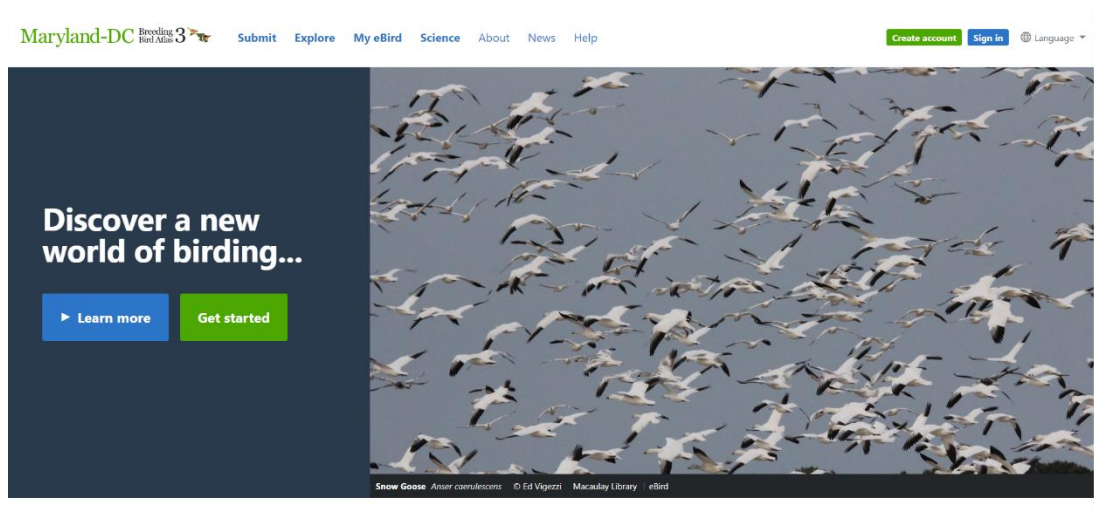
Next, provide your name, a username and password, and your email. Click 'Create account'.

Now that you're signed in, you can begin submitting data! To submit a checklist, click 'Submit'.

Next, select the location you were atlasing. The best way to do that is to 'Find it on a Map'. Type the name of the block or county you were atlasing in into the blank box and select the correct option from the drop-down menu. Avoid using 'Select an entire block' as your location; the data provided through this method are coarser and much less useful.

Next, enter the date of your checklist. Select the button next to the most appropriate 'Observation Type'; this will usually be either 'Travelling' or 'Stationary'. Choose Travelling if your checklist was made while you were moving, and choose Stationary if you did not move.

Once the Observation Type has been selected, you can provide the time you started your checklist, how long your checklist was for, how far you travelled, and how many other atlasers were with you. Once you have entered this information, click 'Continue' at the bottom right of the page.

You can now enter which species you saw. In the top right, begin typing the name of the bird. Select the correct option from the drop-down menu that appears.

Once you have selected the bird, you can enter how many you saw. Please avoid using 'X' when describing how many birds. Even if you do not know the exact number of birds, a rough estimate will still provide more information than an 'X'. Next, select 'Add Breeding Code'.
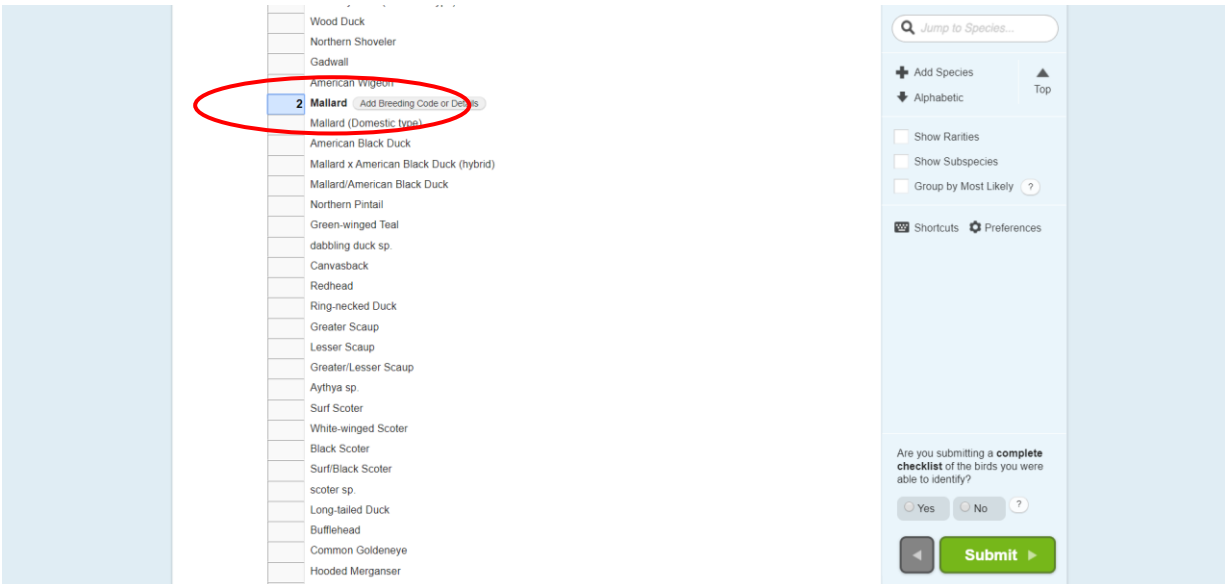
A drop-down menu will appear and you can select the highest applicable code to that species on that checklist. Please note that each checklist is independent of other checklists you will enter, so the breeding codes must be entered for each species regardless of breeding codes you or anyone else has found earlier (except for codes S7 and M). You are recording the behavior that you observed on the current checklist.
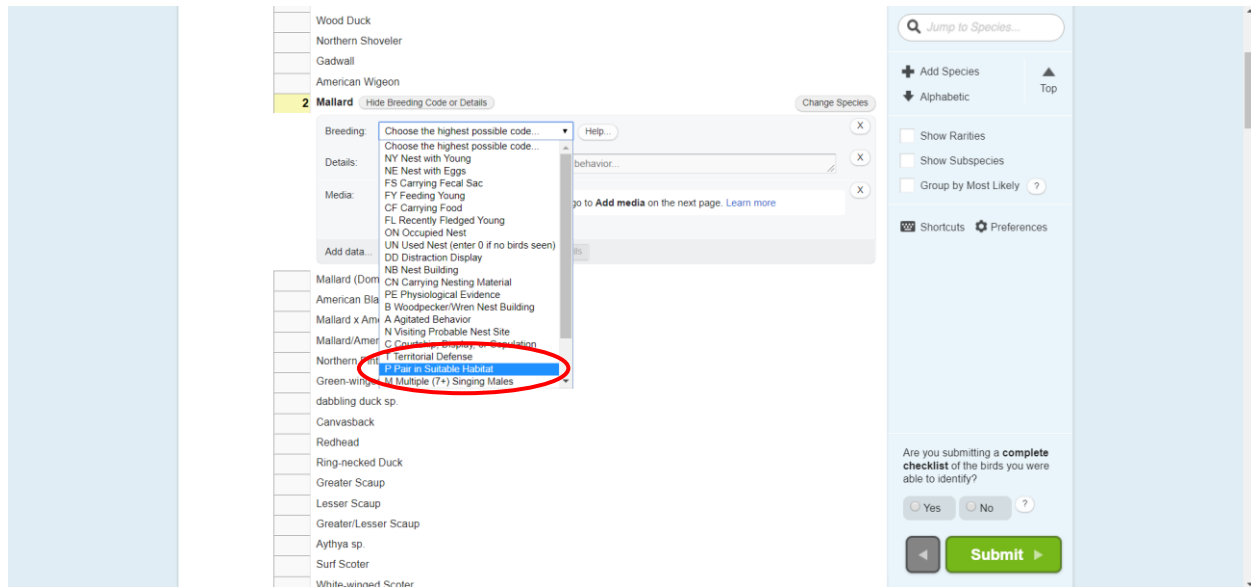
Once you are finished entering all of the birds you have seen, you are ready to submit your checklist. If you have entered every species you were able to identify for that checklist, then answer 'Yes' for 'Are you submitting a complete checklist?'. We strongly recommend you try to submit each checklist as a complete checklist, and not leave out 'common' birds like pigeons or starlings. Complete checklists are the source of the most useful atlas data.

You can now hit 'Submit'! Congratulations, you are now an atlaser and have successfully contributed valuable data to the Maryland & DC Breeding Bird Atlas 3!

Appendix B: Using eBird Mobile 2.0

Entering data on the eBird mobile app is similar to the desktop site, but with a few perks. It allows you to enter the data immediately—no transcribing data when you get home from notebook to computer—and it records the precise location, the date, time, duration, and length of the checklist automatically.

First, download the app onto your phone and sign in—the process for this will be the same as for the other apps on your phone. Next, and this is important, **select the correct portal**. If you skip this step, none of your observations will count towards BBA3! Select the 'More' option in the bottom right corner.
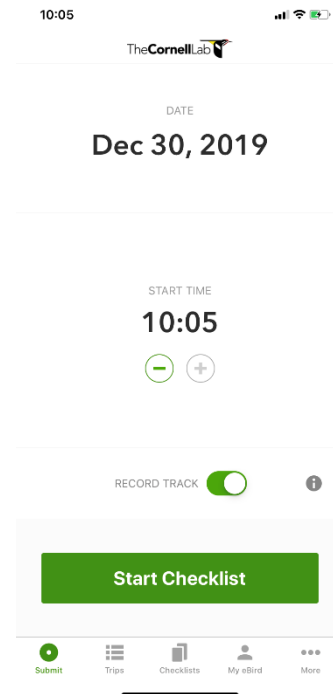
Now, select the 'Settings and Account' option.	
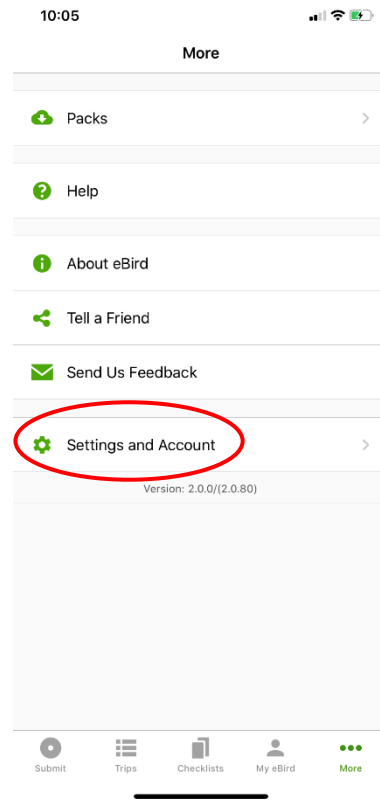
Now, select the 'Portal' option.	
Scroll down until you see 'Maryland-DC Breeding Bird Atlas'. Select this option. You are now ready to create a checklist, so navigate back to the Home page (tap 'Settings' in the top left, then 'Done' in the top left).	
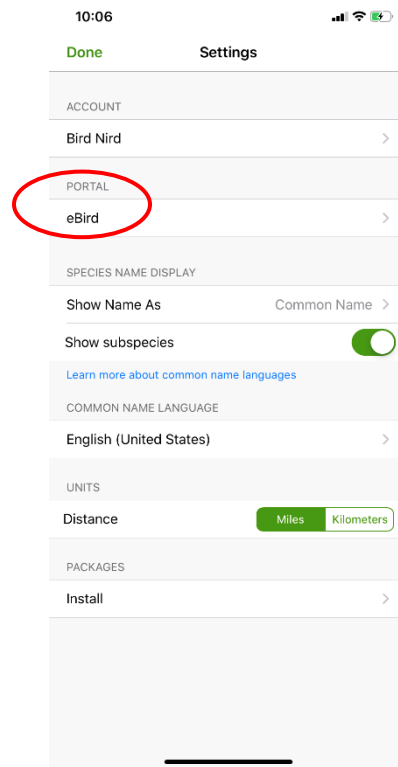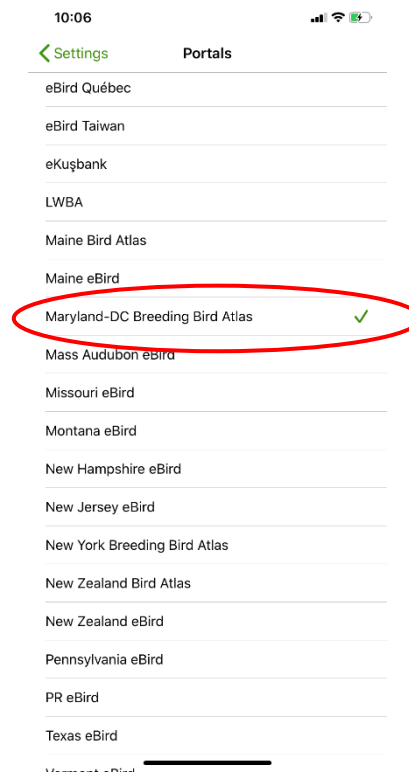
On the home page, select the large, green 'Start Checklist' icon near the bottom of the screen.
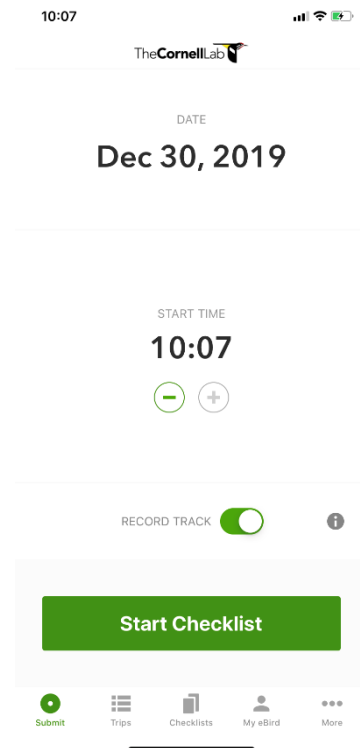
Your checklist will begin immediately, and will continue until you select the 'Stop' button in the bottom right. To record an observation, tap the '# species name/code' bar near the top. Remember not to cross block boundaries with an active checklist!
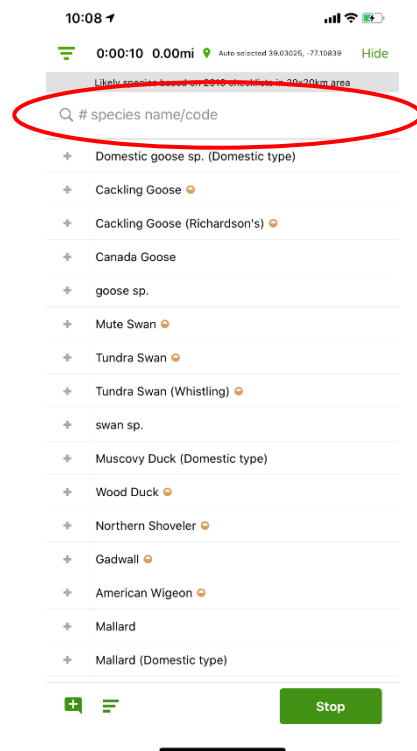
|	
Record birds as you see them. Type the number of birds you saw followed by the species in the search bar. If you see more of the same species, you can use the same method and those new birds will be added to the total.	
To add a breeding code, select the appropriate species from the list.	
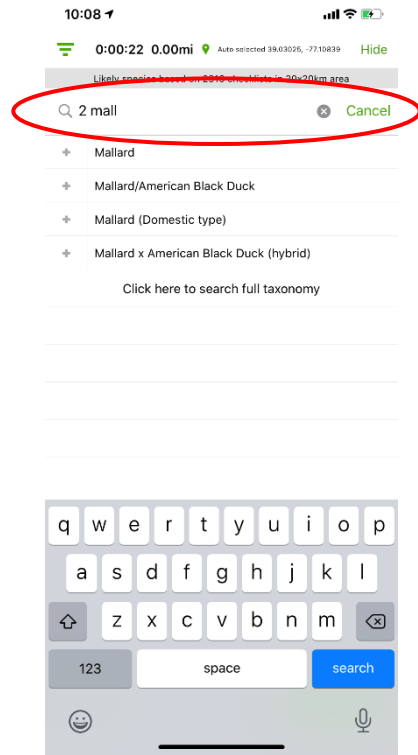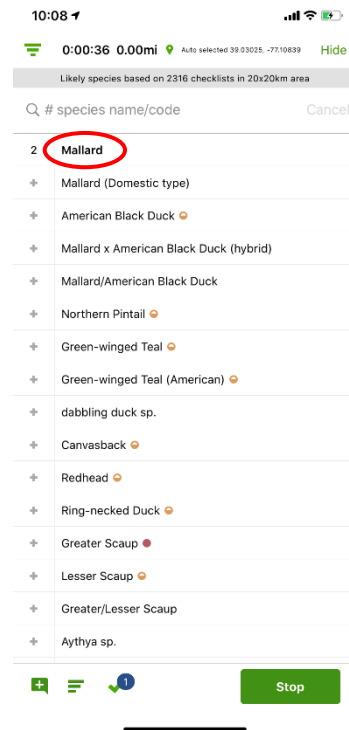
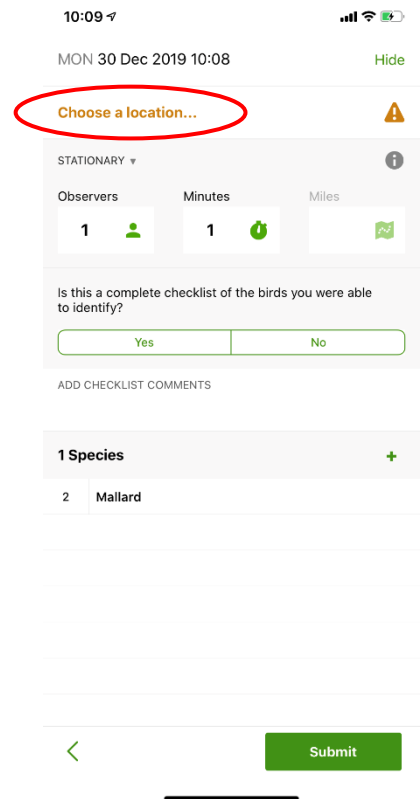|	
Next, select the 'Breeding code' tab.	
From the menu, select the most appropriate code.	
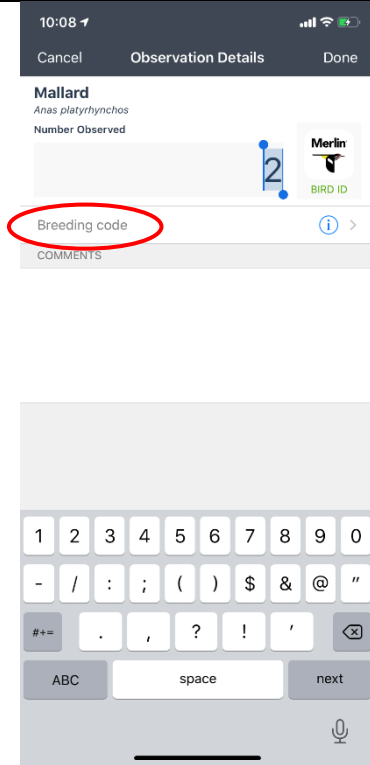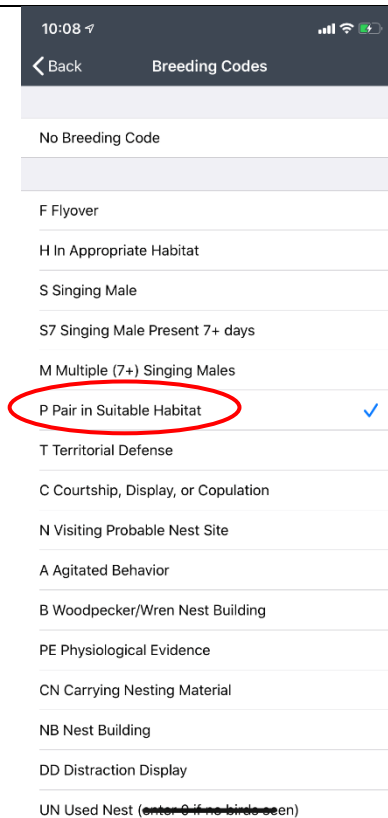
When you are ready to stop the checklist, press 'Cancel' in the top right to hide the keyboard, then press the large, green 'Stop' button in the bottom right.
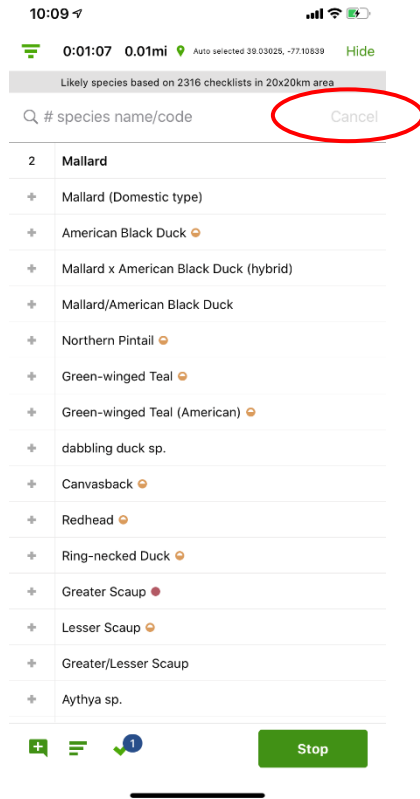
You must now choose the location where you were birding. Tap the orange 'Choose a location' tab.

Now, you can either select a recently used location ('Recent', in the top left), a nearby location ('Nearby', in the top center), or look on a map to determine your location ('Map', in the top right). We recommend you use the map option.
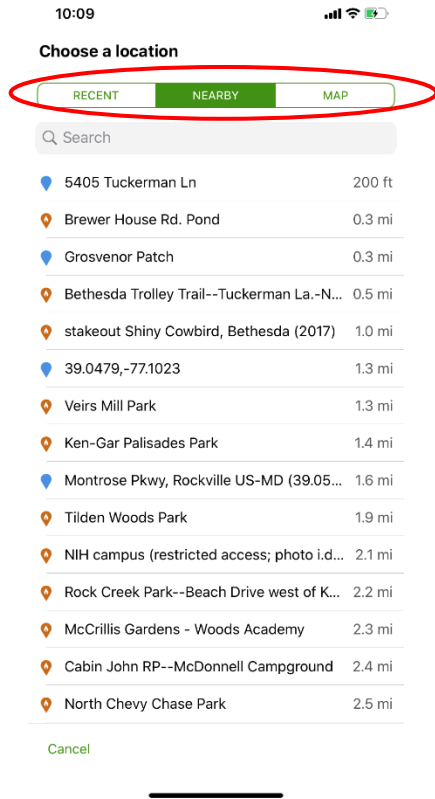
If you select the map option, you will see a map of your current location. Confirm it is correct, then select the large, green 'Use this location' button in the bottom right.
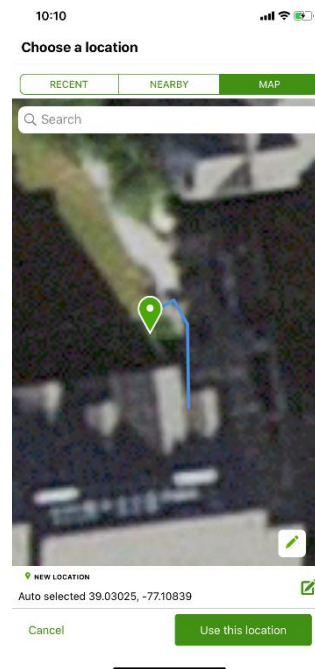
Once your location has been selected, you should add any additional observers (for example, if you were birding with two other people, tap the observer icon twice). Confirm the duration and distance of your checklist is correct. If you recorded every species you could identify (which we strongly recommend you do), then answer 'Yes' for 'Is this a complete checklist of the birds you were able to identify?' When you are sure everything is correct, hit 'Continue' at the bottom of the screen. Congratulations! You are now an atlaser and have contributed valuable data to the Maryland & DC Breeding Bird Atlas 3!