

# Santa Cruz County Breeding Bird Atlas II

## *What is a Breeding Code?*

A breeding code is a standardized code corresponding to a specific breeding behavior. The breeding codes are organized in a hierarchy based on the amount of certainty a bird is actually breeding at or near the location it is observed. For example, if a nest with young (the highest breeding code) is found, it is certain the bird is breeding at that location contrary to if only an adult in suitable breeding habitat (the lowest breeding code) is observed. The latter scenario could be of a bird that finished breeding, had not yet started breeding, or was not breeding at all because it was a post-breeding dispersant or passage migrant, and consequently the same assumptions about breeding cannot be made that a higher code, such as nest with young, permits. Nevertheless, an adult in suitable breeding habitat—while not indicating the bird is breeding at that location with high certainty—represents some form of breeding activity and can be assigned a breeding code.

The breeding codes are grouped into three classes of evidence: confirmed, probable, and possible. Ideally we want to find confirmed evidence for every species thought to be breeding in each block. For several reasons this is not possible to do; some birds are very difficult to confirm (e.g., Virginia Rail), while others may simply elude being confirmed during the project. The impossibility of confirming every species thought to be breeding in each block is the rationale for using three categories of breeding evidence. We would rather have some form of breeding evidence, even if the evidence is of less certainty than confirmed evidence, than none at all when mapping species distribution.

A breeding code is used to describe an observation of a male, a female, young, or some combination of the three behaving or otherwise indicating breeding activity. Each observation can be assigned one breeding code. For example: five singing male Bewick's Wrens represent five independent observations because each male could attract a female and raise young in an independent nest.

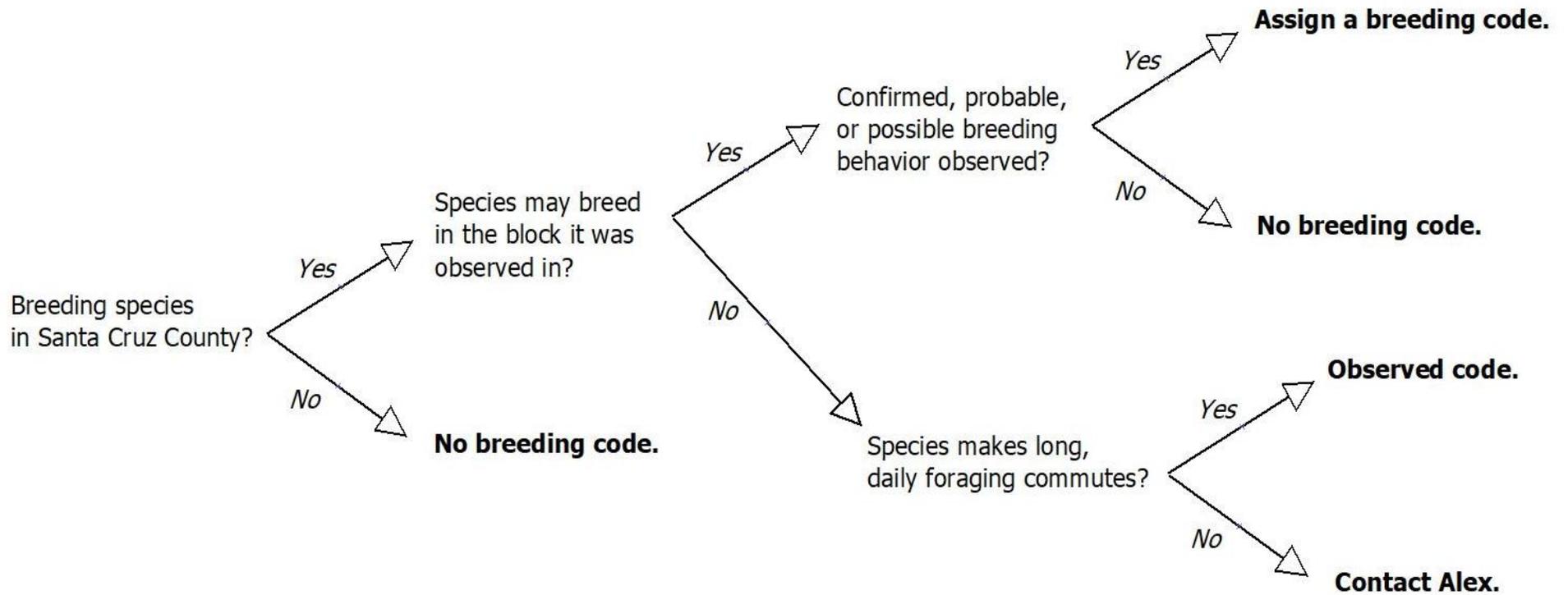
**Always choose the highest breeding code that describes what you observed.** For example: a female Wrentit could be in suitable breeding habitat, carrying food, and feeding young all in the same observation. Three different breeding codes describe the observation, but only record the highest of them. In this case, the correct breeding code to record would be feeding young as it is a higher breeding code than the other two

Sometimes the initial behavior of a bird may not match the definition of any breeding code. Often, continued observation will clarify what the bird is doing. Sometimes birds get away before their behavior is interpretable, and if that is the case, do not assign a breeding code. Alternatively, if you are in doubt about which breeding code should be used in an observation of yours, consult Alex for a recommendation.

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## Observation Flowchart

The flowchart below outlines common outcomes for most observations. Note that there are some situations when a breeding code should not be assigned to an observation.



# Santa Cruz County Breeding Bird Atlas II

## *Breeding Codes*

Choose the highest code that describes what you observed. Consult the full definitions of the breeding codes for caveats and guidelines for the use of each code. Contact Alex (arinkert12@comcast.net) if you have questions about the breeding codes.

### **CONFIRMED**

NY—Nest with Young  
NE—Nest with Eggs  
FS—Carrying Fecal Sac  
FY—Feeding Young  
CF—Carrying Food  
ON—Occupied Nest  
FL—Fledged Young  
PY—Precocial Fledged Young  
UN—Used Nest  
DD—Distraction Display  
PE—Physiological Evidence  
NB—Nest Building  
CN—Carrying Nest Material

### **PROBABLE**

B—Wren/Corvid/Woodpecker/Plover Nest Building  
A—Agitation  
N—Visiting Probable Nest Site  
C—Courtship, Display, Copulation  
T—Territorial Defense  
S7—Singing Male Present 7+ Days  
M—Wren/Corvid Carrying Nest Material  
P—Pair in Suitable Habitat

### **POSSIBLE**

S—Singing Male  
H—In Suitable Habitat

### **OBSERVED**

O—Observed

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## *Breeding Code Definitions*

### CONFIRMED

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#### **NY—Nest with Young**

Nest with young seen or heard. At least one of the young must be alive; if none are alive, use UN—Used Nest.

#### **NE—Nest with Eggs**

Nest with eggs. The eggs in the nest must be seen in order to use this code.

#### **FS—Carrying Fecal Sac**

Adult carrying a fecal sac of a nestling away from the nest. This code is rarely used.

Adults remove fecal sacs (a clean, whitish, round, gelatinous membrane containing the excrement of nestling birds) from the nest to reduce odor which may attract predators and also to maintain a sanitary environment for the young. Fecal sacs are typically dropped by the adult soon after they leave the nest.



*photo by Dave Kinner*

#### **FY—Feeding Young**

Adult feeding recently fledged young. The young must be out of the nest to use this code. Beware the females of several species (e.g., Oak Titmouse, Chestnut-backed Chickadee, nuthatches, and goldfinches) can act like fledglings by emitting begging calls, fluttering their wings, and opening their bill when the male provisions them during courtship.

#### **CF—Carrying Food**

Adult carrying food for the young. For most species food for the young is invertebrates, but some feed their young other types of animals, fruit, seeds, carrion, or human food. Often adults gather several food items in one mouthful before returning to where their young are. If a bird appears to be deliberately carrying food, it is assumed the food is for its young unless it is a species that carries food for other reasons. This code should not be used for any seabird, raptor, or Corvid which may carry food for themselves or their mate, or over long distances. Use this code carefully for Oak Titmouse, Chestnut-backed Chickadee, and nuthatches—all of which the male carries food to provision the female while breeding. Other species do engage in mate provisioning, but the male usually ingests the food before it is received by the female and therefore not visible when being carried.

# Santa Cruz County Breeding Bird Atlas II

## *Breeding Code Definitions*

### CONFIRMED

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#### **ON—Occupied Nest**

An active nest—a nest with eggs or nestlings—which the contents of the nest cannot be seen or heard. The active status of the nest is indicated by the behavior of the adult. An adult sitting on a nest, either incubating eggs or brooding young, is considered an occupied nest because active status of the nest can be inferred from the behavior of the adult. An adult frequently entering or leaving a nest site, typically a cavity, where the nest contents cannot be seen or heard can be considered an active nest. However, be cautious as birds only investigating potential nest sites do go fully in and out of cavities. One way to distinguish between a bird investigating and one visiting an occupied cavity is by the duration the bird spends fully inside the cavity. If the bird enters the cavity (not carrying food or nest material) and does not come out for a long period of time, the nest can usually be considered occupied.

#### **FL—Recently Fledged Young**

Recently fledged, *feathered* or *partially feathered* young restricted to the natal area by dependence on adults for food or protection, or limited mobility. Commonly observed behaviors indicating dependency include incessant begging by wing quivering while opening the bill and emitting begging calls, and short bouts of floppy flight. This code can be used for either altricial or precocial species, as long as the fledged young are *feathered* or *partially feathered*. Beware that young of some species disperse far from their natal grounds when still partially dependent, and that fledged young of species near the border of a block may present problems in determining their origin. If the origin (the block they hatched in) of the young is suspect, please indicate this in your notes on the datasheet.

The young and adults of some species, such as Caspian and Elegant Tern, and Common Murre, disperse into Santa Cruz County from their natal grounds outside the county. While the young of these species may still be dependent, they are not currently known to breed in the county and therefore cannot be assigned a breeding code. Only species that breed in county, or in an atlas block encompassing land of an adjacent county, can be assigned a breeding code.

# Santa Cruz County Breeding Bird Atlas II

## *Breeding Code Definitions*

### CONFIRMED

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#### **PY—Precocial Fledged Young**

Flightless, *downy* young restricted to the natal area by dependence on adults or limited mobility. This code applies to flightless young of precocial species still retaining their down. Species in the following groups have precocial young: waterfowl (ducks and geese), gamebirds (turkey and quail), grebes, coots and gallinules, rails, and shorebirds. This is not an eBird breeding code; use FL in eBird.

#### **UN—Used Nest**

A nest not currently in use or eggshells found. Some complete nests may appear to be old, but a general rule of thumb is to make two visits to the nest on separate days to confirm the suspicion. A bird may be off gathering nest material or on a long foraging trip for its young, so generally do not assume the nest is old unless there is good reason to suspect so. Eggshells are sometimes found on the ground, but as with old nests, they can be extremely difficult to identify to species. Exercise caution when identifying these. Even if a nest or eggshells cannot be identified to species, they provide a clue of where to look for future breeding activity. If you find a depredated nest, use this code.

#### **DD—Distraction Display**

A distraction display, or injury feigning, used to draw perceived predators away from a nest or young. A well-known example is the broken-wing display where an adult will hold one of its wings at an award angle, feigning injury, while slowly moving away from the nest or young.

#### **PE—Physiological Evidence**

Physiological evidence of breeding (e.g., highly vascularized, edematous incubation [brood] patch, cloacal protuberance, or egg in the oviduct seen on a bird in the hand). This code is only to be used by experienced bird banders on locally breeding species during the breeding season.

# Santa Cruz County Breeding Bird Atlas II

## *Breeding Code Definitions*

### CONFIRMED

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#### **NB—Nest Building**

Adult seen building a nest at the actual site. Birds are often seen carrying nest material, but use this code if the bird is working on a visible nest. Birds refurbishing an old nest by adding or removing materials can also be considered nest building. Incomplete nests do not necessarily mean that a bird is building; the nest could be old. Some species such as California Scrub-Jay, American Crow, Common Raven, Killdeer, Snowy Plover, and all wrens build dummy or “practice” nests, which are nests they do not intend to actually raise young in. For that reason, this code should not be used for those species.

Woodpeckers excavate holes separately used for breeding and roosting, so this code cannot be used for that group of species either.

#### **CN—Carrying Nest Material**

Carrying nest material, but the nest was not found. A commonly used code when a bird is seen carrying nest material to a nest it intends to raise young in. As with nest building, this code should not be used for the following species: California Scrub-Jay, American Crow, Common Raven, all wrens. Exercise caution when using this code for observations near the border of a block, as the observation should be assigned to the same block where the actual nest is. If this cannot be confidently determined, make sure to indicate so in the notes on your datasheet.

### PROBABLE

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#### **B—Wren/Corvid/Woodpecker/Plover Nest Building**

Nest building by wrens and Corvids (except Steller’s Jay), scraping (nest building) by Killdeer or Snowy Plover, or excavation by woodpeckers. These species engage in nest construction that may not lead to a nest they intent to raise young in. This is not an eBird breeding code.

# Santa Cruz County Breeding Bird Atlas II

## *Breeding Code Definitions*

### PROBABLE

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#### **A—Agitation**

Agitated behavior or anxiety calls from an adult in reaction to a perceived predator. The behavior needs to be persistent and obviously relating to distress from being close to a nest or young. Dive bombing and incessant distress calls are both common signs of agitation. This code is often confused with T—Territoriality, for good reason as there is overlap in the behaviors exhibited. The difference lies in what instigated the behavior. Agitation is generally aggression toward a *different* species (whether that be a bird, a mammal, etc.) because of a threat to its nest or young, while territoriality is generally considered aggression toward the *same* species because of intrusion on a breeding territory. This code should only be used in the breeding season of the species, as at other times of the year they may be aggressive toward perceived predators for reasons not related to nesting.

#### **N—Visiting Probable Nest Site**

Adult visiting a probable nest site. This usually means an adult was seen investigating a potential nest site, such as peering into a cavity, but can also mean that circumstances during your observation were not conclusive enough to indicate a nest was present. A bird just standing on a nest where the contents cannot be seen is a frequently observed behavior that is best considered visiting a probable nest site.

#### **C—Courtship, Display, or Copulation**

Courtship behavior, displays, or copulation by a pair. There are myriad courtship behaviors, but the most commonly seen are synchronized flight (specifically by diurnal raptors) or display dives (hummingbirds), mate provisioning (male feeding a female), and display postures. These behaviors are frequently coupled with a song or call, sometimes distinct to courtship. Generally, these behaviors or vocalizations should be specific to courtship activity.

#### **T—Territorial Defense**

Permanent territory presumed through defense of territory. Defense is presumed through the individual chasing or acting highly aggressive toward others of the *same* species. Not to be confused with agitation which can result in similar behavior, but the aggression is directed toward *other* species generally perceived as predators threatening a nest or young.

# Santa Cruz County Breeding Bird Atlas II

## *Breeding Code Definitions*

### PROBABLE

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#### **S7—Singing Male Present 7+ Days**

A male singing from the same perch seven or more days apart, presumably on an established breeding territory. This code is only to be used in **June** when nearly all migrants have passed through the area, unless the species is known to be resident at the location. Generally this code is reserved for males of species that have a recognizable song: most Passerines (perching/song birds), doves and pigeons, owls, and Anna's Hummingbird. In many of these species the female also sings, but her song is rarely heard, is less articulate, and quieter than the male song. However, the females of some species, such as California Thrasher and European Starling, sing nearly as much or as much as the males and the song is indistinguishable. The Santa Cruz County Breeding Bird Atlas II is taking a more liberal approach to this code; we recommend use of this code for all species that have a recognizable song, even if sex of the songster cannot be determined.

#### **M—Wren/Corvid Carrying Nest Material**

A California Scrub-Jay, American Crow, Common Raven, or any species of wren carrying nest material. These species build dummy or practice nests; see CN for more details. This is not an eBird breeding code.

#### **P—Pair in Suitable Habitat**

A pair observed in suitable breeding habitat during its breeding season. This code applies to sexually dimorphic species (i.e., those where the male and female are recognizable by their different plumage or vocalizations). Some sexually dimorphic species include Common Yellowthroat, Mallard, and California Quail. Do not use this code for monomorphic species such as Chestnut-backed Chickadee, Song Sparrow, or California Towhee unless their behavior or vocalizations indicates they are a pair. One bird near another does not necessarily mean the two are a pair. There must be behavior involved that indicates an association. Generally refrain from using this code for species with complex social systems, such as Red-winged and Tricolored Blackbirds, which are polygynous (males have many female mates) and Acorn Woodpeckers which are polygandrous (males and females each have many mates) in California. This code should not be used for hummingbirds as they do not form pair bonds.

# Santa Cruz County Breeding Bird Atlas II

## *Breeding Code Definitions*

### POSSIBLE

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#### **S—Singing Male**

A singing male present in suitable nesting habitat during its breeding season. This code is only to be used in **June** when nearly all migrants have passed through the area, unless the species is known to be resident at the location. See Probable—Singing Male Present 7+ Days for more details, exceptions, and guidelines.

#### **H—In Suitable Habitat**

Adult in suitable nesting habitat during its breeding season. This code is only to be used in **June** when nearly all migrants have passed through the area, unless the species is known to be resident at the location. Be careful when assessing suitable habitat. Refer to the Santa Clara and Monterey County Breeding Bird Atlases for information about breeding habitats of species in this region. eBird is also a good resource to use. Check to see if the species has been reported at the location in June when nearly all migrants have passed through.

### OBSERVED

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#### **O—Observed**

An individual observed during its breeding season, but not in suitable nesting habitat. This code only applies to species that breed in Santa Cruz County, and those that are commonly seen making foraging trips far away from where they actually nest. These species often make long foraging commutes to areas where they do not breed. This is not an eBird breeding code. The observed code is frequently used for the following species:

Brandt's Cormorant	Bald Eagle	Northern Rough-winged Swallow
Pelagic Cormorant	Pigeon Guillemot	Purple Martin
Double-crested Cormorant	Marbled Murrelet	Tree Swallow
Great Blue Heron	Western Gull	Violet-green Swallow
Great Egret	Black Swift	Barn Swallow
Turkey Vulture	Vaux's Swift	Cliff Swallow
Osprey	White-throated Swift	Tricolored Blackbird
Golden Eagle	Peregrine Falcon	

# Santa Cruz County Breeding Bird Atlas II

## *Practice Scenarios*

These practice scenarios are to test your understanding of the breeding codes. The scenarios are designed to help you avoid pitfalls by presenting realistic scenarios that frequently confuse atlasers. Consult the breeding code definitions when working through the scenarios, and remember to always choose the highest breeding code that describes what was observed.

*Choose the correct breeding code for each scenario below.*

1. You see a European Starling fly into a cavity carrying food. Then it exits the cavity carrying a fecal sac, dropping it a short distance from the nest.
2. In May a Great Blue Heron is seen hunting in the grassland at UCSC.
3. A female Anna's Hummingbird is plucking fluff from a cattail, then flies off carrying some in its bill.
4. Female Red-winged Blackbirds are gathering dried grass in a pasture near Swanton Pond. They then fly to the pond with grass in their bill. You follow them and find them adding the grass to their nests.
5. Three recently fledged Dark-eyed Juncos are on your backyard patio. You then see the adult feed one of them.
6. On a spring morning you see a Wrentit moving through the chamise at Loma Prieta.
7. Two Western Tanager young are on the ground incessantly begging. They have trouble flying away when a hiker walks by. You see the adult gathering food in the canopy above.
8. An American Robin is seen pulling worms on a lawn, then while carrying several in its bill, it flies up to its nest high in a tree. You can hear young in the nest begging loudly, but the nest is too high in the tree to see the nestlings.
9. Eight young Wood Ducks covered in down are following mom on the San Lorenzo River.
10. The long, musical song of a Pacific Wren wakes you up on a July morning.

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## *Practice Scenarios*

11. Two Red-tailed Hawks are soaring together overhead, frequently calling and both with their legs dangling.
12. A large cottonwood branch fell in your backyard during a winter storm. While cleaning the debris up, you find an empty American Robin nest in the crotch of the branch.
13. While at Harkins Slough you see a Tree Swallow peering inside a cavity in a branch overhanging the slough.
14. A California Thrasher is scratching around in the underbrush. In its bill are several grubs, and it continues scratching and picking up more.
15. An adult Killdeer is intentionally walking with a crooked wing near you.
16. While walking on East Cliff you see an American Crow fly by carrying a stick.
17. A Marsh Wren is putting the final touches on its nest woven into the cattails at Struve Slough.
18. For the past 15 minutes a Double-crested Cormorant has been sitting on its nest high in a Eucalyptus at Schwan Lake.
19. On a late spring afternoon a Northern Mockingbird is dive bombing you at your mailbox.
20. Following a Mourning Dove with nest material leads you to its nest. The dove is adding material to its nest that already contains two eggs.
21. Two Wilson's Warblers are relentlessly chasing each other through the undergrowth.
22. In early June you see an Olive-sided Flycatcher singing from a snag on a Doug-fir. Two weeks later, you revisit the location and again see one singing from the same snag.
23. A male and female American Goldfinch are flying from tree to tree, staying close to each other.

# Santa Cruz County Breeding Bird Atlas II

## *Practice Scenario Answers*

1. FS—Carrying Fecal Sac
2. O—Observed
3. CN—Carrying Nest Material
4. NB—Nest Building
5. FY—Feeding Young
6. H—In Suitable Habitat
7. FL—Fledged Young
8. NY—Nest with Young
9. PY—Precocial Fledged Young
10. S—Singing Male
11. C—Courtship, Display, Copulation
12. UN—Used Nest
13. N—Visiting Probable Nest Site
14. CF—Carrying Food
15. DD—Distraction Display
16. M—Wren/Corvid Carrying Nest Material
17. B—Wren/Corvid/Woodpecker/Plover Nest Building
18. ON—Occupied Nest
19. A--Agitation
20. NE—Nest with Eggs
21. T—Territorial Defense
22. S7—Singing Male Present 7+ Days
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