

## Monitoring Nest Boxes at Quail Hollow

Welcome to the Quail Hollow Ranch Nest Box Project, co-sponsored by the Santa Cruz Bird Club. The project was started in 2002 in order to provide habitat for cavity-nesting birds, in particular the Western Bluebird. Western Bluebirds now regularly fledge from our boxes, as do other species, including Ash-throated Flycatcher, Chestnut-backed Chickadee, Oak Titmouse and Violet-green Swallow. We have also had Bewick's Wrens and House Wrens use our boxes.

Each season starts in March and ends when the last bird has fledged, generally sometime in July. Volunteers regularly tour the boxes installed at the park and observe and record data about the birds' nesting and breeding habits. This is a citizen-science project and our data is kept at the park, as well as reported to the Cornell Lab of Ornithology, where it becomes part of the nationwide NestWatch program, sponsored by the National Science Foundation.

The following are some general instructions and guidelines for volunteers participating in the project.

### **GENERAL INFORMATION**

Each of two teams will be monitoring the nest boxes to determine:

- What **species** is using the box?
- How many **eggs** are **laid**?
  - o What date is the first egg of the clutch laid?
  - o What is the date the clutch is completed?
- How many **chicks hatch**?
  - o What is the **hatch date**? (The day the first egg hatches.)
- How many **chicks fledge**?
  - o What is the **fledge date** (may be a range of days) the nestlings leave the nest?
- Did the nest have unhatched eggs, dead chicks, or **did it fail**? If so, why?

Field supplies and a binder containing our official records are kept in the large mailbox on the parking-lot side of the Quail Hollow Visitors' Center. Please remember to return all of the equipment you use, including the binder, so that it is available for the next nest box checker. Field supplies include: a Phillips screwdriver to open the boxes, extra bolts and wing nuts if needed to secure the poles, a small flashlight, a mirror, a ruler, gloves and facemasks. You will want to bring a pair of binoculars. Please be aware of the presence of poison oak and ticks!

New volunteers will work with others on the team who will accompany them in the field until they are comfortable going by themselves. You can sign up on the calendar on the Volunteers Reference Page linked on our website at [www.qhnestbox.org](http://www.qhnestbox.org).

Each time you check the boxes, take with you some record of the most recent observations. You can use a copy of the email report from the previous nest box checker, or you can take a Field Notes Worksheet from the binder. When collecting data, remember that more information is better than less—note any observation that you think might be of possible interest, such as the

behavior of the birds near the box, even if they are not nesting, or other birds or animals nearby. And note the time of day and weather conditions.

## **OBSERVATIONS IN THE FIELD**

When you check a nest box, first ***look and listen*** from a distance for signs of activity ***before you approach*** the box. This will give you information about whether the nest box is occupied, what species is occupying the box, and what stage the process is in (nest building, eggs, young, or fledging).

Gently lower the box.

Open the box slowly. This is simply precautionary, in case eggs or nestlings are pressed against the wall of the box. Be prepared for a possible surprise. A mouse? A wasp? A lizard? When you are finished, make sure that the box is screwed shut completely.

Be sure when you raise the box back up that you leave its opening facing the same direction—this is very important to the birds! Direction is noted on the poles.

**CAUTION:** Please watch your step when walking off-trail – several bird species including Western Meadowlark, Spotted Towhee, and Killdeer nest on the ground. If you see a bird flush, stop and step very carefully. And watch for badger holes!

Understanding the nesting cycle makes daily checking unnecessary. Once nesting activity has begun, we generally check nests twice a week to ensure that we can record times for each stage (laying/incubating/brooding/fledging). Some boxes may need to be checked more frequently to get an accurate date, and some less frequently if the nest should not be disturbed.

Each team is responsible for **scheduling** its team members to complete the necessary checks, using the Quail Hollow Nest Box Calendar. There is a link to this calendar on the Nest Box Project website, [www.qhnestbox.org](http://www.qhnestbox.org) (on the Volunteers Reference Page).

## **REPORTING DATA**

The basic data you gather **must be transcribed** onto the Individual Nest Box Records in the binder every time you return from the field.

**Within 24 hours**, email the data to other Nest Box Project members at [qhnestbox@gaggle.email](mailto:qhnestbox@gaggle.email).

The emails reporting observations are our **field records**, so please include the following:

- The **team** and the **date** boxes were checked.
- The **time of day** and the **weather**.
- The **names of the checkers**.
- The **boxes** checked (identified by number).
- The **species** using the box.

- The **amount of time** you were in the field. The volunteer coordinator needs this information for park records.
- Use **Cornell codes** to describe Adult Activity, Nest Status and Young Status, as explained below.
- Calculate estimated **hatch** and **fledge** dates, if applicable, and note if the box needs an extra check or does not need to be checked by the next person. You can also note additional observations, information or cautions, even if not part of your team's boxes.

Each team has a data entry person who will enter this information on the Cornell website.

### **ADULT ACTIVITY**

Check for adult activity each time before you approach and open the box. If there is no activity at or near the nest box, record this information as **NO**. If adults are seen or heard nearby, record as **VA**. If you see the adults with nesting materials, record this as **BA**. If the adult is incubating the eggs, and remains on the nest, record as **RA**. If the adult is flushed from the nest when you open the box, record as **AA**.

Cornell codes for Adult Activity are:

- NO = no adults seen or heard
- VA = adult(s) remained in vicinity of the nest box during the check
- BA = adult building nest or carrying nest material
- AA = adult flushed from nest during check
- RA = adult remained on the nest, or in the nest box
- FA = adult feeding young at nest or seen carrying food
- DA = dead adult(s) at or near nest site

### **NEST STATUS**

Nest building can be completed as quickly as two days, or can take as long as two weeks. Approach with caution, particularly early in the nesting cycle. Limiting disturbance during nest building and egg laying will minimize the chance of parents abandoning the nest.

Once eggs are laid and incubation has begun, birds will typically **not** abandon their nests, and checking nests with nestlings will **not** cause parents to abandon them.

If there is no nest in the box, record as **NO** for Nest Status. If the box has a nest, or the beginnings of a nest, take notes regarding materials and depth, and make any other observations about the nest construction. Nests in the early building stages are small and thin, and may look disorganized. (Record as **IN**, incomplete nest.) When the nest is complete (record as **CN**), the inner cup may be lined with soft feathers or fur. The transition from **IN** to **CN** is sometimes hard to determine.

Cornell codes for Nest Status are:

NO = no nest

IN = nesting materials present; nest building appears to be underway

CN = nest appears to be structurally complete, with an obvious central cup

DN = damaged nest

AN = another nest found in same site (begin new attempt)

NN = non-avian nest found (bees, mouse, squirrel--describe in comments)

FN = flattened nest, with fecal matter

RN = nest removed, remover unknown

**When NOT to open the boxes:**

- In the *morning during egg laying*. Nest boxes should be checked after 11:00 during egg laying, since most females lay their eggs in the morning and are absent from the nests during mid-day and in the afternoon.
- During the *first few days of incubation*. Observe the box from a distance, and approach only when the female leaves the nest to feed. You may have to wait up to 10 minutes.
- When *young are older than 9 days*. Young disturbed after this may leave the nest prematurely. Young that fledge prematurely do not stay in the nest box despite attempts to return them, and their survival rates are very low.
- During *inclement weather*. If the weather is cold, damp, or rainy, postpone checking the box until another day. Checking boxes during this time can be very stressful for the birds.
- *When you don't need to*. For example, if it has been established that the clutch consists of 5 eggs, you don't need to open this box again until near hatching time.

**EGG LAYING**

Once a nest is complete, the female will begin to lay eggs. To get an accurate count of the eggs, it is important that you examine the nest thoroughly. Some birds, like CBCH or OATI, use nesting material to cover the eggs when they leave the nest. This means that you may need to GENTLY probe the nest cup for eggs. If the female has hidden the eggs they will typically be very shallow and loosely covered with moss or feathers. Often the eggs are not covered. If possible, count the eggs by sight. A mirror and flashlight may be useful.

An accurate count of eggs is important because this will allow us to determine the date the clutch is complete and estimate a possible hatch date. Songbirds lay one egg per day, in the morning, until they have laid a clutch of 3-8 eggs. Then they begin incubating all the eggs.

**Determining Clutch Initiation and Completion Dates.** Simple math will help determine the date that the first egg was laid in the nest and the date that the final egg was laid (clutch completion). If a CBCH nest had 3 eggs when checked on the afternoon of April 3rd, we would know that the female started laying her eggs on April 1. If the same nest was checked again on April 8th and had 6 eggs, we can calculate that the clutch was complete with 6 eggs on April 6th and incubation started on that date.

## INCUBATION AND HATCH DATES

Once the clutch is complete the female will begin to incubate the eggs. Try to avoid flushing the parent off the nest during the first few days of incubation—**wait** until the bird has come off on its own. Many birds follow the pattern of 20 minutes on the nest, 10 minutes off the nest. If the parent leaves, GREAT. If not, move on to the next box. You can come back if you have time.

Chicks should start hatching roughly 12-17 days after clutch completion (see Nesting Characteristics page or charts by species in the binder ). Eggs in a clutch will typically all hatch on the same day, or over two days.

Estimating the day the eggs will hatch is very useful. To do so, refer to the chart for that species in the binder. Or count from the day the clutch is complete, using the average incubation period for the particular species. Make a note of the **estimated hatch date (EHD)** on the Individual Nest Box Record Sheet in the binder, and in your email field notes. Someone on your team should try to check the nest on or close to that date.

**Estimating Hatch Dates.** If our CBCH nest had a complete clutch of 6 eggs on April 6th, we would expect eggs to hatch 13 to 16 days later, between April 19th and April 22nd. If we checked the box on April 19th and found 6 eggs, and checked the box again on April 21st and found 6 mostly naked chicks, we could estimate that the eggs hatched on April 20th, 14 days after clutch completion.

## YOUNG STATUS

Getting an accurate chick count can be challenging. The best option is to try to count the number of young on hatch day, or shortly thereafter, when they are small enough that you can see individual chicks. After the chicks are a few days old, they may be intertwined and on top of each other and thus hard to count. If you need to gently touch or nudge some of the young to count them you may do so. Tapping the edge of the nest box may cause the young to beg, and counting their gaping mouths can be useful in counting nestlings.

Songbird chicks are altricial and are born tiny, naked, blind, and defenseless. (Report as **NY**, naked young.) In about 3 weeks they're fully feathered and grown, and ready to leave the nest! In between, at day 6 or 7, they start to open their eyes, and you can see the beginnings of feathers. (Report as **PY**, partially feathered young.)

Cornell codes for Young Status are:

- NO = no young present in nest
- HY = at least one chick hatching or has just emerged from egg
- NY = nestlings naked and pink, or with sparse down, eyes typically closed
- PY = wing feathers emerging, eyes open
- FY = body feathers completely cover skin
- VY = vocal young, heard only

It is best **not to open nest boxes** after chicks are 9-13 days old (depending on the species) because **THEY MIGHT JUMP OUT!** So, check to see how old the chicks are before you consider opening the nest box. If they are past 9 days old, you can determine whether the nest is still active by watching for parents coming to the box with food for the nestlings, or by approaching and listening for movement or “peeps” from the nest.

## **FLEDGE DATES**

With a successful nest, we will want to know the day that the young fledged (left the nest), and whether or not all the chicks fledged. Some species, like Violet-green Swallows, fledge over a number of days. And sometimes one or more young die in the nest. We can estimate the fledge date (**EFD**) by counting 15 to 23 days from the hatch date, depending on the species. (See Nesting Characteristics page and charts by species in binder.)

Watch the nest carefully around the estimated fledge date. Nestlings’ heads poking out of the box waiting for food is a good sign that fledge day is close. Ideally, we know that a nest has fledged if we see parents near the nest feeding young outside of the box. Be sure to report this. This is the single best determinant of nest success.

## **COMPLETED OR FAILED NESTS**

If you see the young being fed outside the box, or if you have watched for a while and the parents are not feeding, lower the box, tap it, and listen for the young, before you open the box. If it is empty, examine the nest box for signs of success: lots of poop and a nest squashed down by big nestlings. (Record as **FN**, flattened nest.)

If at any time nest activity stops or the nest is empty, look inside and write down what you see—Are there eggshells in the nest? Unhatched eggs? Dead nestlings? Are the eggs or nestlings completely gone? Is there disturbance to the nest lining? Is the nest torn apart? Or did the young fledge? **Please do not remove nests. One person on each team will be responsible for this.**

After the fledge, if you find unhatched eggs or dead nestlings, this can be due to a variety of factors: eggs may be unfertilized, poorly incubated, or otherwise defective, and nestlings may die if parents, for many reasons, are not able to adequately feed them.

## **COMMUNICATION IS THE KEY**

Monitoring nests is both fun and informative! It also requires good communication between nest checkers to ensure that we’re collecting the best quality data possible. Talk to your team if you have a question. And if you have the time, let the Park Interpreter know what is going on with the nest boxes.

**THANK YOU FOR YOUR HELP AND HAVE A GREAT SEASON!**

