Maine Tree Swallow Nest Box Monitoring Program

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A Project of the
Maine Natural History Observatory
In Collaboration with the Maine Bird Atlas,
a Project of the Maine Department of Inland Fisheries and Wildlife

Introduction

Thank you for your interest in Maine's Tree Swallow Nest Box Monitoring Program. This is a project coordinated by Maine Natural History Observatory in partnership with the Maine Bird Atlas, a project of the Maine Department of Inland Fisheries and Wildlife. Your efforts to place nest boxes in appropriate breeding habitat and monitor their use will help us to understand the breeding distribution of swallows in Maine and increase the number of nesting options for this remarkable species.

Nest boxes should only be installed if the volunteer intends to monitor and maintain the box throughout the season. An unattended box can be detrimental to swallows and other native nest box users if non-native species begin using the box. Paper wasps, mice, squirrels, and even snakes may take up residence in an unattended nest box. For more information on how to handle these situations, see the "*Maintaining Nest Boxes*" section below.

Why Monitor Tree Swallows?

Like many other aerial insectivorous bird species, Tree Swallows are decreasing in number throughout their northeastern breeding range. Although likely due to a culmination of many issues, the loss of suitable nesting cavities has been identified as a contributing factor. Fortunately, Tree Swallows will readily make use of man-made nesting sites when provided in areas of suitable habitat.

Tree Swallows are vulnerable to threats like habitat destruction, pesticide pollution, and competition with invasive species including the European Starling and House Sparrow. Understanding the issues which negatively impact this species will require a better understanding of the species' distribution during the breeding season and their breeding behavior at nesting sites.

Natural History

The Tree Swallow is a highly recognizable species with a long history of monitoring in North America. Although this species is most associated with open country (where they

forage), Tree Swallows rely on trees for their nesting sites. While this species is known to use the nesting cavities created by woodpeckers as nest sites, artificial nest boxes put out by people now play a large role in the species' breeding success. Marshes, grasslands, and agricultural lands with nearby nesting sites all provide suitable breeding grounds for this charismatic species.

The Tree Swallow is a medium-sized swallow. Males sport metallic blue upperparts with white throats, breasts, and flanks. Young females are more subdued in appearance but gain the vibrant blue upperparts and white underparts of the males as they age. Both males and females have gray flight feathers, dark eyes, and small gray bills. Juveniles are gray-brown and have white breasts. The Tree Swallow has a rich vocal repertoire consisting of chirps, chatters, gurgles, and shrieks. Fledgeling begging calls can sometimes be heard from within nest boxes.

Tree Swallows typically nest in areas near water where they can forage for insects. Wetlands, lakeshores, wooded swamps, and riverine areas are particularly suitable. Historically, Tree Swallows have nested in woodlands flooded by beaver activity where dead trees were numerous. As adaptable cavity nesters, however, these birds will nest in habitats away from water provided a suitable nesting site and adequate insect prey is available. Boxes in grasslands and meadows may attract Tree Swallows. Tree Swallows are acrobatic aerialists that pursue insects in the air above water and in open areas. From dawn to dusk, these birds can be found actively feeding on and gathering flies, dragonflies, caddisflies, and mayflies.

Male Tree Swallows arrive on the breeding grounds ahead of the females. Tree Swallow pairs form upon the arrival of females. Males locate suitable nesting sites and defend the site from competitors. Males advertise themselves and their nest sites through singing a long, complex chattering song and through posturing near the nest site. Once the pair is formed, both pair members may add a few items to the nest site a few days or weeks prior to nest building. Although a highly social species, males will guard nest sites and will chase off competitors that enter the breeding territory. Males and females will often copulate on a perch nearby the nesting site. Tree Swallows nesting close proximity will often work together

to chase off potential predators. For more information on breeding behaviors, see the "*Monitoring Protocol*" section below.

Tree Swallow nests are typically composed for dry grasses, but may also include rootlets, animal hair, and pine needs. Females are typically responsible for gathering materials and constructing the nest. After egg laying, nests are provisions with the feathers of gulls, waterfowl, and domestic birds. Females are typically responsible for incubating eggs and incubation lasts approximately 13-14 days. After hatching, nestling Tree Swallows are brooded by the female. Males and females feed nestlings which typically remain in the nest for 15-25 days before fledging. After leaving the nest site, young swallows will often remain in the company of their parents (who will continue to feed them) for several days. Tree Swallows typically raise only one brood of nestlings each year.

Tree Swallow in Maine

Tree Swallows are a migratory swallow species and are typically found in Maine during only the breeding season. In the breeding season, they are widely distributed throughout the state and can be found in every Maine county.

Nest Box Monitoring

For this project, we are asking volunteers to install nest boxes in Tree Swallow habitat and to monitor these boxes throughout the breeding season. The breeding season is a sensitive time for nesting birds. Because of this, our efforts are designed to minimize disruption that could lead to stress on these birds. The safety of the volunteer monitors, the nesting adults, and their young is a priority. It is important to adhere to the monitoring protocol described below to best guarantee a successful season for all parties. Lastly, it is important to remember that if your nest box remains unoccupied, this is still important information. If no birds take up residence in a nest box this season, that is okay. We still would like for you to collect data that can be used to inform our effort. Give the birds some time to find your box, but if your box remains unused after a couple of years, it is worth moving the box to a new location.

Where to Install Nest Boxes

Tree Swallow nest boxes should be installed on a post near wetlands, lakes, rivers, or grassland areas. Grassland sites with near water and with large areas of unmowed grass are especially suitable. Sites with extensive tree cover and limited open space for foraging should not be used. Nest boxes should be installed in areas with limited human activity to avoid disrupting nesting pairs.

Nest boxes should be installed between 5′ and 6′ in height on a post. The box should ideally be installed with its opening facing south or east. The box should be easily viewable from 30′ away and birds should have a clear flight path to the box. While volunteers are welcome to install and monitor more than one nest box, each swallow box should be installed at least 35′ apart. If competition with other native birds arises, add an additional box at least 35′ distant and monitor both boxes.

Predators should be considered when picking a location for the nest box. It may be impossible to avoid all potential predators, but pay particular attention if the area has outdoor cats and pick a location for the box where cats cannot climb and access the nest box.

Nest boxes should only be installed if the volunteer intends to monitor and maintain the box throughout the season. An unattended box can be detrimental to swallows and other native nest box users if non-native species begin using the box. Paper wasps, mice, squirrels, and even snakes may take up residence in an unattended nest box. For more information on how to handle these situations, see the "*Maintaining Nest Boxes*" section below.

Monitoring Protocol

Here in Maine, the Tree Swallows breeding season runs from approximately May 1st until July 15th. These safe dates indicate the time period where most migrating birds have already reached their breeding grounds. As such, these dates will serve as the start and end date for conducting nest box monitoring. Nest boxes should be installed by April 15th to best ensure that the box is considered by arriving males. Any breeding behaviors observed before

or after the safe dates should be noted in the comment section on the back of your monitoring data sheet and/or entered into eBird.

It is important to remember that nest boxes are not always used immediately after they are put up (actually, we expect less than 50% of boxes will be used in the first few years), and we hope that this does not discourage you. Perseverance is essential as it takes time for birds to find a nest box and learn that it can be safe for nesting. If your nest box does not attract a nesting swallow, it is not a wasted effort. Other species may still use the box for nesting or roosting. Also, our goal is to put out an excess of Tree Swallows boxes across Maine, so we are not expecting all boxes to be occupied in the first few years.

May 10th to June 22nd: Monitoring should be conducted once per week. During these first four weeks of monitoring ending on June 22nd, observations should be limited to viewing the nest box from a distance of approximately 30' to avoid disrupting the swallows during the early nesting phase (see the "*What to Look For*" section for more details). The time and duration of your visit is up to you and your availability. We ask that you spend *at least* 15 minutes conducting observations per visit during this period. All observations should be entered onto your monitoring data sheet. A possible indicator that Tree Swallows breed in the area would be the presence of an adult in appropriate habitat (code **H**) or hearing a singing adult (code **S**). There are several probable indicators of breeding which may be observed. An adult visiting a probable nest site (likely the nest box) should be coded as **N**. Skirmishes between males early in the breeding season are part of territorial defense and should be coded as **T**. The presence of a pair moving together and interacting in the area should be coded as **P**. If you hear singing adults heard in the area 7 or more days apart use code **S7**. Confirming swallow breeding will likely occur during the latter portion of the season, however, you likely will observe adults carrying nesting materials (such as feathers, grasses, and small twigs) (code **CN**) during the early portion of the monitoring window.

June 23rd to August 15th: During this latter part of the survey period (once eggs are suspected to have been laid) monitors are asked to limit their observations to once every two

weeks. Volunteers should continue to make observations of breeding behaviors at a distance. During this period, behaviors that confirm breeding are more likely to be observed. Volunteers may hear nestlings begging from within the box or see them waiting at the box entrance (**NY**). Additionally, volunteers have the option to make brief nest box checks to note the number of eggs and/or nestlings. Once at the nest box, volunteers will gently tap the outside of the box (to encourage any adults to leave the box), open the box, count the number of adults, eggs, and/or nestlings, and close and secure the nest box. You may discover that a second brood is laid during this period. If this is the case, note this in on your datasheet and repeat the monitoring protocol. If any young fledge prematurely with the disturbance, gather them up and put them back in the nest box. You may need to put your hand over the hole for a few minutes while the young settle before you can quietly move away. Take care to avoid inhaling any dust from old nests and always wash your hands after working at a nest.

While conducting visits to the nest box, it is important to work quickly and quietly. The amount of time spent at the open nest box should be limited to the time it takes to make your counts and no longer. In most instances this should be no longer than 10 to 15 seconds. Do not touch the birds or reach into the box for any reason. This work should be conducted as quietly possible. The data sheets should not be completed at the nest box, but back at the vantage point 30' from the box. If the adults appear stressed by your presence, move back another 30'.

Maintaining Nest Boxes

Proper maintenance of the nest box is just as important as nest box placement. Nest boxes should be cleaned and, when necessary, repaired between seasons. At the end of the season (once all the young have fledged and the nest box is unoccupied), take down the nest box. Aiming to remove the box by August 15th should allow adequate time, however, leave the box up longer (2-3 weeks) if the box is still being used by nesting songbirds. Leaving the box up between seasons could mean squirrels, wasps, mice, or other species could nest in the box. Take down the box, empty it of any nest materials (wear gloves) while taking care not to breathe any of the dust that stirs up, and store the nest box in a dry, protected place until the

next field season. Do not use any cleaning solutions when cleaning out the box. If there is a build-up of debris stuck inside the box, use warm water and stiff-bristled brush to clean out the box (dry in the sun before storing).

A note on competition with non-native birds: Introduced Old World species such as European Starlings and House Sparrows often compete with native species for nest boxes. The smaller diameter openings used for Tree Swallow nest boxes may help in excluding these species. These introduced species threaten native wildlife and are therefore not protected by state or federal laws. There are two options for if invasive bird species take up residence in your Tree Swallow nest box. Option 1: Nest box removal. Once an invasive species moves into the box, it is very unlikely that swallow will use the box that same field season. Therefore, volunteers who are comfortable doing so are welcome to remove nest boxes for the season and dispose of any materials, nests, and eggs associated with an invasive species discovered in a Tree Swallow nest box. These contents should be disposed of well away from the nest box. Option 2: Continue your observations. While preventing invasive species from nesting is the ideal solution, some volunteers may not feel comfortable disposing of invasive species nesting materials and eggs. That is okay. If that is the case, you are encouraged to continue your observations. If you observed European Starlings or House Sparrows entering the box, inspect the box as soon as possible to confirm the invasion and either remove the box for the season or continue making observations of the invasive species. If one of these non-native or any other native species takes up residence in your nest box, note the species in the comment section on your form. If a *native* bird species takes up residence in the box, simply make note on your data sheet and continue your observations. Native bird species should not be disrupted regardless of if they are the project's target species.

A note on competition with other wildlife: Occasionally, you may discover that other forms of wildlife have taken up residence in your nest box. These may include mice, squirrels, insects, and snakes. These animals can be removed from the nest box if you are comfortable doing so. Should you decide to remove these animals, proper precautions should be

exercised during this type of maintenance. If rodent nests are found within the box, remove the contents with gloved hands. Small paper wasp nests can be manually removed from boxes and destroyed with a gloved hand. Do **not** use any insecticides to exterminate insects as these products may contain chemicals which can be hazardous to nesting birds using the box. If a particularly large nest of stinging insects is suspected or detected, make note. Large stinging insect nests will likely have to be removed at the end of the season. Unless discovered and removed quickly at the beginning of the season, the presence of any of the animals discussed above will likely mean swallows do not use the nest box this field season. Any box which is invaded by these non-bird animals should be relocated to a new location the following field season. Do **not** risk injury to yourself for the sake of nest box maintenance.

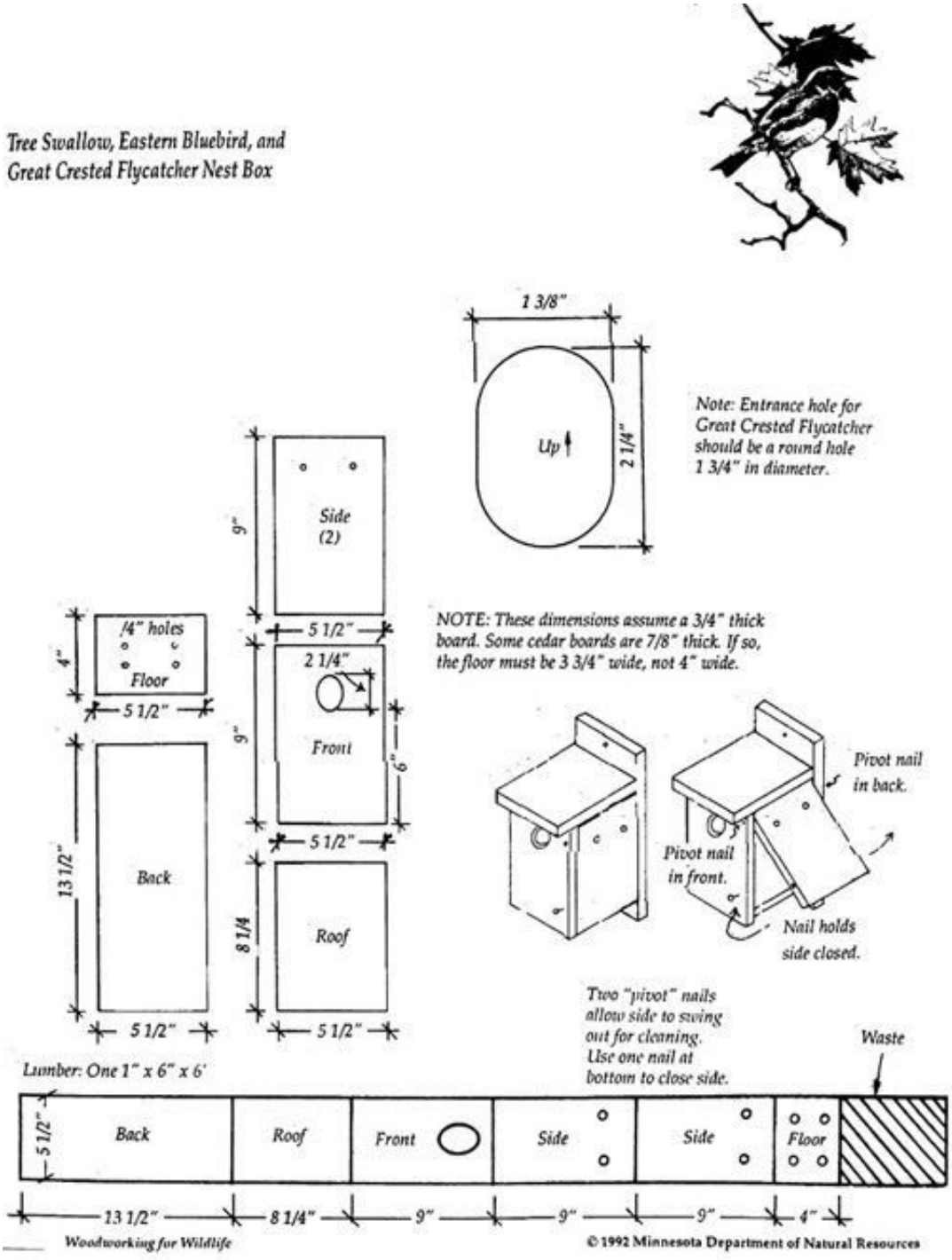
Reporting your results

Send your completed datasheets to Maine Natural History Observatory at the end of the field season (contact info on the datasheet), or enter your results directly on our website. In addition, it is very helpful if you can enter these breeding records directly into the Maine Bird Atlas eBird portal (https://ebird.org/atlasme/home). If you prefer not to enter your records online, you can mail us your completed forms, and we will enter your observations into our databases.

Nest Box Plans

A good nest box design must be secure from predators, weatherproof, simple and inexpensive to construct, monitor, and maintain, and the target species must accept and use the box to successfully fledge health young. A limited number of Tree Swallow nest boxes are available free to volunteers. If we have run out of our supply of nest boxes, you can get on a waiting list when additional nest boxes are available, or you can build your own using the plans below. See the "Contact" section should you have any questions about the nest box plans. These nest plans have been generously shared by "Woodworking for Wildlife". Note that the dimensions given in these plans do not need to be measured to the nearest fractions of an inch - natural nest holes where swallow nests are variable in size and their openings also

differ in size and shape. There is room for experimentation in nest box design, defense against predators, and siting. Using wood from scrap piles or even driftwood will help to keep costs down. Do not paint or treat the wood for a nest box with any preservatives. It is often helpful to use a marker to number your nest boxes so that it is easier to keep track of multiple nest boxes.



Materials:

- Standard board 1″ x 6″ x 6′ long
- (20-30) 1 ½″ Exterior Screws (trimhead)
- (2) 8 Penny Common Nails, galvanized (for hinge)
- (4) 3″ wood screws or galvanized lag screws and washers (for mounting)
- (1) 2″ hook and eye (for locking the nest box)
- (1) 1 ½″ predator guard
- Cordless Drill
- Table Saw
- Skill Saw or Chop Saw
- Jig Saw or 1 ½″ hole saw
- Hammer
- Caulking Gun and Acrylic Latex Caulk (optional)

Instructions:

1. Begin by assembling all necessary tools and nest box components. Your materials should consist of front, fixed side, opening side, bottom, back, roof, a predator guard , and a latch (to secure the opening side).
2. Preassemble the nest box to ensure the fit of each part - make adjustments as necessary.
3. With the box still preassembled, attach the Front of the box to the Fixed Side and the Bottom with 1 ½″ exterior screws. **Special note**: The Bottom should be installed approximately 1/2″-1″ from the bottom edge of the front and sides of the box. This will help prevent rain from running into the box during storm events.
4. Place the box with the Front facing down and fasten the Back of the box to the Fixed Side and Bottom with 1 ½″ exterior screws.
5. Turn the box over with the Back facing down. Fasten the Roof to the Front, Back, and Fixed Side of the box using 1 ½″ exterior screws. **Do not** attach the Roof to the Opening Side.
6. Now to install the opening side. Ensure that there is a large enough gap at the top of the Opening Side so that you can open the box once the hinge nails are installed. Hammer a galvanized nail through the Front of the box through the top of the Opening Side. Turn the box over and nail through the Back of the box into the Opening Side exactly opposite the first nail. These nails will function as a hinge.
7. Install the hook and eye latch on the bottom of the Opening Side. This will keep the Opening Side of the box securely fastened.

8. Using a 1 1/2" hole saw, cut an opening through the front of the box. Clean out debris from inside the box.
9. Attach the predator guard to the front of the box around the opening. The predator guard will prevent animals from widening the nest box entrance.
10. The nest box is ready to deploy!

Helpful tips:

- Predrilling all your holes will help prevent splitting when fastening the box together.
- **Do not** use wood glue on your nest box. Doing so will make replacing a damaged component on the box far more difficult. Instead, use a thin bead of acrylic latex caulk along the seams of the box (barring the Opening Side). As the nest box continues to dry and shrink, you can add caulk to seal any cracks that form.
- You can add a piece of hardware cloth, a small block, or make a series of horizontal cuts on the inside of the box below the opening to make it easier for nestlings to access the opening.

Contact

For questions regarding this project, please contact:
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