Vancouver Island University

Swallow Nest Box Monitoring Manual

Version 1

August 2019

Compiled by Eric Demers

1. INTRODUCTION

Tree Swallow (*Tachycineta bicolor*) are familiar and common birds in coastal British Columbia. While they normally nest in tree cavities excavated by other species like woodpeckers, they also readily accept nest boxes. Along with their abundance, this feature makes them favourite species for biologists to study on their breeding grounds.

The VIU Bird Banding project monitors 30 nest boxes at Buttertubs West Marsh in Nanaimo. Monitoring takes place during April to July, when nest box contents are checked regularly, eggs and young are counted, and adults and their young are banded.

The objectives of this project are to:

1. provide a long-term record of breeding performance of Tree Swallows at Buttertubs West Marsh; and,

2. provide training in field ornithology for students and other volunteers.

2. NEST BOX LOCATION

The 30 swallow nest boxes at Buttertubs West Marsh are laid out in the open field. **Figure 1** shows the distribution of nest boxes at the site. **Figure 2** shows two types of nest boxes used at Buttertubs West Marsh. Nest boxes are installed on studded T-bar posts approximately 1.6-1.8 m above ground.

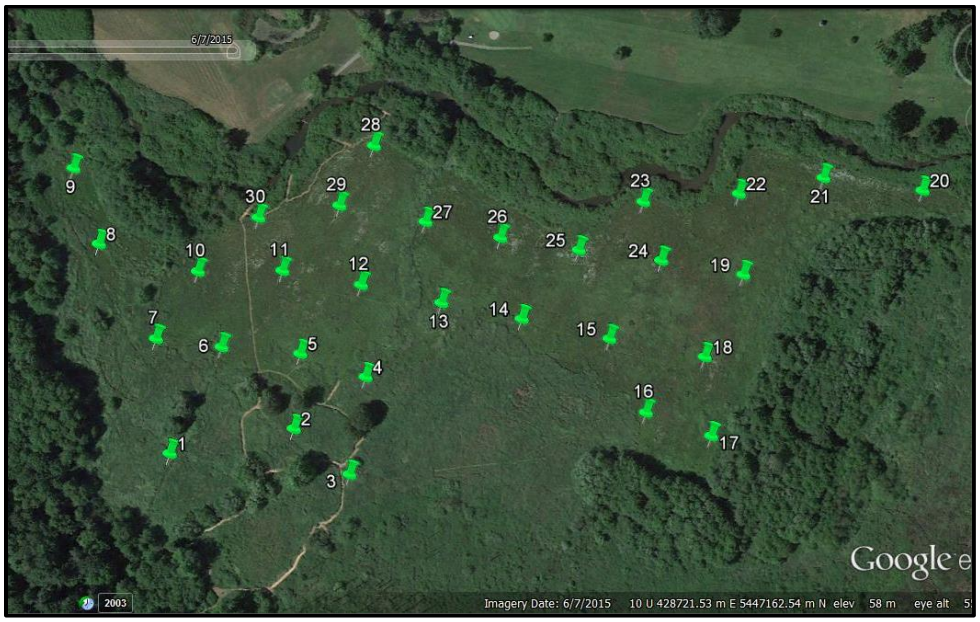

Figure 1. Location of swallow nest boxes at Buttertubs West Marsh.

Figure 2. Two types of nest boxes used at Buttertubs West Marsh.

3. FIELD OPERATIONS

3.1. Weather Records

Local weather parameters are collected during each day of monitoring. These should include air temperature, cloud cover (in 10th), wind direction and speed, and precipitation.

3.2. Nest Box Checks

Equipment:

- Swallow nest box monitoring binder with datasheets.
- Pencil.
- Footstep to reach up into boxes (if necessary).
- Banding equipment and bands (if necessary).
- Binoculars to observe boxes at a distance.

Nest box checks are scheduled to record important events in the nesting cycle (see Table 1). The normal frequency of checking at various stages is summarized below, but this should be regarded as indicating the minimum amount of checking needed if the nest is progressing in a normal way. If in doubt, additional checks should be done. Do not check nest boxes in the rain.

Table 1. Stage of nests, tasks and frequency of completion for each task.

Stage	Task(s)	Check Frequency
1. Before first egg is found	• Record contents of nest box	Every 3 days
2. Egg-laying – one or more eggs present	• Record contents of nest box • Count eggs	Every 3 days
3. Clutch complete; incubation	• Count eggs • Determine Date of Last Egg Laid • Capture and band female, if present	Every 3 days
4. Hatching – about 14 days after Date of Last Egg Laid	• Count eggs and nestlings • Determine Mean Hatch Date (MHD) and Day 12 post hatching (D12)	Every 1-3 days
5. Active feeding of nestlings – days 1-12 after MHD	• Count nestlings • Trap and band female and male	Every 1-3 days
6. Mean age of brood 12 days	• Band, weigh and inspect nestlings for parasites	Once
7. Mean age >12 days	• Record number of young. Do not handle.	Every 1-3 days until gone
8. Final check and cleanup – at least 2 weeks after mean age of brood 12 days	• Record number of dead unbanded and banded nestlings, and band number(s). • Discard nest contents.	Once

3.2.1. Nest building

Nest box checks that take place during the nest building period should record the condition of the nest as follows:

- Amount / depth of nest material: description of nest content and approximate depth in cm (approximate using finger widths).
- Nest shape: 0 = no defined shape, 1 = ring shape, 2 = partial cup, 3 = complete cup.
- Number of feathers.

3.2.2. Eggs

Eggs should be counted during each nest box check. This can be done by looking and feeling inside the box. If a lower than expected number of eggs is counted, it may be necessary to take a photo with a phone camera or remove eggs briefly to appropriately look and feel around the nest to find any missing egg.

Eggs are usually laid in the early morning (around 07:00). Checking after 09:00 usually records all eggs laid on that day.

Check the boxes *every 3 days* during incubation. Predation is possible, and therefore it is important to keep counting eggs and record any missing eggs. If the clutch appears to be complete at 4 or fewer eggs, it may represent a case of skipped laying.

3.2.3. Banding females during incubation

Females perform all incubation tasks. When approaching a nest during nest checks, always place one hand over the nest box opening to trap the female inside in case she is present and incubating. Open the nest box carefully and slightly to see if a female is present. If a female is present, proceed to retrieve her carefully for banding. Make sure to avoid disturbing the nest contents during extraction as she will likely hold on to nesting material with her claws. If necessary to prepare for banding, place the female in a bird bag until you are ready.

Adult banding should proceed based on the standard banding procedure (as described in the VIU Bird Monitoring and Banding Manual), but the data will be recorded in the swallow nest box monitoring binder. The required data include: band number, new or recapture, age, sex, wing chord, tail, fat score, breeding characteristics (BP, CP), weight, date, time, bander ID, nest box number. Make sure to transcribe any banding / recapture data on the bird banding datasheets for the banding station.

Adults should simply be released after processing. Do not place an adult back in the nest box as it may disturb the nest. Adults will return to the nest box on their own once you leave.

3.2.4. Hatching

It is important to determine hatching times as accurately as possible. This is done by visiting nests frequently (if possible; minimum every 3 days) during the hatching period (about 14 days after Date of Last Egg Laid) and recording the condition of the young when first seen.

3.2.5. Mean hatch date

For each clutch, it is important to estimate the mean hatch date. This will be based mainly on observations of eggs and newly-hatched young.

3.2.6. Post-hatching monitoring

Calculate the dates on which each brood is 12 days of age by adding this number to the mean hatch date. Check the nests every 3 days until day 12 and record the number of nestlings present. This can be done by looking and feeling inside the box. If a lower than expected number of nestlings is counted, it may be necessary to remove the nestlings briefly to appropriately look and feel around the nest to find any missing young. Dead young often end up buried into the nest material. Do not disturb the nest in order to find a missing young; it will likely turn up as a “mummified package” when the boxes are vacated.

3.2.7. 12-day checks

The young can be banded and weighed when they are 12 days of age. This is best done with two people. Take all young out of the box and place them together in a bird bag. Proceed to band and weigh each young, and inspect them for parasites (e.g., blowflies, flatflies, mites, etc.). Return each young in the box after banding.

The required data include: band number, weight, date, time, bander ID, and nest box number. Make sure to transcribe the banding data on the bird banding datasheets for the station. The age code is "4 by NN" (local nestling in nest with pin feathers), and the sex is "U" (unknown).

3.3. Trapping Adults

Equipment:

- Swallow nest box monitoring binder, pencil.
- Standard banding equipment: size 1 bands, pliers, scale, weighing tray.
    - Note that Violet-green Swallow (if present) takes band size 0.
- Traps and masking tape.
- Binoculars to watch the boxes while the traps are set.

Adults can be trapped anytime from when the first young hatch and until they are 12 days old. It is high priority that all adults be trapped, but it does not matter when this is done, provided it is done before the young are 12 days old. It is preferable, however, to do as much trapping as possible soon after hatch, so that more attention can be given to "difficult" birds later.

Males and females can be trapped with drop traps while feeding young. Any adult found in a box with young should be removed and examined, unless known to have been previously caught. Band numbers should always be checked, even on individuals already banded. Adults already processed during the current nesting season and for which the data are available in the swallow nest box monitoring binder do not need to be processed again and should be released.

Females take precedence over males for processing and release. However, processed females may be kept for up to 1 hour until the male is trapped. This may be needed to avoid re-trapping the female before trapping the male. Releasable pairs take precedence for processing over females that must be kept to catch the related male. Some males may be difficult to trap, but no more than three capture attempts should be completed on any nest box.

Trapped birds are processed using the usual banding procedure in use at the banding station. The required data include: band number, new or recapture, age, sex, wing chord, tail, fat score, breeding characteristics (BP, CP), weight, date, time, bander ID, and nest box number. Make sure to transcribe any banding / recapture data on the bird banding datasheets for the station.

3.3.1. Ageing and sexing Tree Swallows

Ageing Tree Swallows is complex, and many intermediates occur. There are 4 age-sex categories determined as follows:

Age / Sex	Breeding Characteristics	Plumage Colour	Description
AHY Male	CP	Blue	>90% of the upper parts iridescent blue
ASY Female	BP	Blue-green	>90% of the upper parts iridescent blue-green
AHY Female	BP	Intermediate	50%-90% of upper parts iridescent blue-green Remainder dull brown or brown tinged with green
SY Female	BP	Brown	<50% of upper parts iridescent blue-green Remainder (>50%) dull brown or brown tinged with green

Note: Brown and intermediate plumage does not occur with CP.