

Department of Conservation – Bat Recovery Group

Guidance on the Safe and Effective Use of Endoscopes in Pekapeka (Bat) Surveys

1. Purpose of this guidance

This document provides practical guidance on the safe, effective, and responsible use of endoscopes (inspection cameras) during surveys for Aotearoa New Zealand's native bats (pekapeka).

It is intended to:

- Support good survey practice
- Assist practitioners to use endoscopes safely and effectively to survey for bats in potential bat roost features in trees and other structures.
- Ensure disturbance to bats is minimised
- Promote consistency across this type of bat survey work in New Zealand.

Endoscopes are a useful tool when used correctly, but they must always be applied with care and diligence to avoid harming bats.

2. What are endoscopes?



Figure 1. Inspecting a temporary artificial bat roost box for signs of bats using a Teslong Endoscope with 6mm head. Note bat droppings can be seen in the corner of the box on the Endoscope's screen. (photo credit – Ian Davidson-Watts)

Endoscopes (also known as borescopes or inspection cameras) are small cameras mounted on flexible or semi-rigid probes, typically with an inbuilt light source and often with the ability to record images.

They allow surveyors to look inside otherwise inaccessible spaces, such as:

- Tree cavities and hollows
- Splits and lifted bark
- Artificial roost structures (e.g. roost boxes)
- Gaps within built structures.

Various options are available including differing size probe heads. It is important to be able to record video and photos and sometimes wifi transmission of the live feed can be useful for competent tree climbers who are checking potential bat roost features (PRFs) at height under supervision of an ecologist on the ground.

Most endoscopes produce low-quality video, often dependent on their internal lighting (Figure 2). However, this is usually sufficient quality to confirm bat presence (Figure 2).



Figure 2. Lesser short-tailed bat recorded by endoscope roosting in a small cavity in a beech tree in the Eglinton Valley. The majority of endoscopes produce low-quality video, but this is usually sufficient to determine bat presence and species identification. However, video quality is also affected by the internal LED lights. The smaller the probe head (and lights) usually lower illumination and video quality. (Endoscope Teslong 6mm head- Photo credit – Ian Davidson-Watts)

3. When are endoscopes useful for bat surveys

They can be particularly helpful for:

- Checking cavities identified during ground or climbing inspections that can't be inspected from visual surveys alone.
- Understanding roost or potential roost feature (PRF) structure (depth, internal form, suitability)
- Looking for evidence of use (guano, staining, insect remains)
- Confirming presence of bats.

They are most useful where:

- Cavities are deep, narrow, or visually obscured
- Supporting aerial inspection activities such as tree climbing surveys or cherry picker (mobile elevated platforms/MEWPs)
- Additional detail is needed to inform management or impact assessment or to consider the roost resource in an area (i.e. when looking at multiple trees).

In many cases, endoscope surveys can be used alongside other survey methods (e.g. acoustic surveys, emergence observations) to confirm bat presence.

4. Practical methods and tips for use

- Use the smallest suitable probe and consider the likelihood of bats or other taxa being present, such as possums and wasps
- Keep light levels (of the probe) as low as possible while still being able to observe the interior or the PRF
- Avoid sudden movements or rapid insertion as bats can be injured if struck by the probe.

The aim is to observe and not to disturb.

Prior to using an endoscope, visually assess the PRF with a torch for any obvious signs of bats near the entrance and to gauge the general nature of the PRF size and form.

Turn the video system **on** and ensure the inspection light is working. Then shape the probe to the likely cavity shape.

Insert the camera probe slowly and gently, simultaneously observing the camera output.

Do not force entry into tight features and avoid pushing into areas you cannot see, stopping if any resistance is felt.

If the feature cannot be fully inspected, other bat survey methods will be required (refer to Department of Conservation Bat Roost protocols).

If a bat or bats are observed in the feature/cavity, re-check you are video recording the camera output and gain as much visual information to confirm species and number of bats as quickly as possible to minimise disturbance.

Avoid repeated inspections of the same cavity where bats are present.

5. What to record during an endoscope survey?

- Cavity type and description
- Internal structure and suitability for use by bats
- Evidence of bat use (e.g., guano, staining)
- Video and stills to support conclusions of use/evidence of bats

When should endoscopes not be used?

Endoscopes should not be used when not necessary to confirm bat presence or occupancy. See Figure 3 for an example of when a still camera held at the roost entrance was sufficient to record images of bats within the cavity and confirm presence.



Figure 3. Long-tailed bat maternity roost in kahikatea cavity recorded using a normal still camera (Sony RX10III). An endoscope wasn't required to inspect this cavity due to its more open nature. Inserting an endoscope without first assessing the cavity could have caused an unnecessary level of disturbance (Photo credit – Ian Davidson-Watts).

6. Hygiene and biosecurity

- Clean equipment between sites

- Avoid transferring contaminants between roosts
 - Follow any relevant DOC biosecurity guidance
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5. Legal protection of bats in New Zealand

All native bats (pekapeka) are fully protected under the Wildlife Act 1953.

6. Dos and Don'ts

DO

- Apply good judgement before inspecting e.g., ask whether another less invasive method can be used like a still camera.
 - Work carefully, slowly and video record as you go as this means you can review the footage during the survey.
 - Keep disturbance to an absolute minimum: once sufficient video/photographs are recorded, withdraw.
 - Stop immediately if bats are encountered.
 - Ensure you are appropriately experienced and authorised.
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DON'T

- Don't force equipment into cavities.
 - Don't use high light intensity unnecessarily.
 - Don't continue inspecting once bats are observed and data collected.
 - Don't repeatedly inspect the same feature.
 - Don't use endoscopes where the disturbance risk is clearly high – i.e. when you know that there are bats in the cavity.
 - Don't assume absence of bats based on a single inspection.
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