

## Monitoring

### Determining Active Nests

- Undertake an initial nest survey to identify active nests and number/name all nest sites. Revisit nest sites that cannot be confirmed but possibly be used by penguins throughout the season to ensure they are not missed.

### Breeding Monitoring

- Breeding monitoring begins 2 weeks prior to the earliest known egg laying date at the colony and monitoring rounds should occur either weekly or fortnightly. 2-3 people is optimum to minimise disturbance to the birds, whilst ensuring efficient and accurate data entry.
- Routinely move through the colony, stopping to inspect each nest with minimum disturbance; speak quietly, avoid shining bright lights directly at penguins, keep the time at nests to a minimum.
- Determine nest status as outlined below, if nest contents cannot be assessed accurately-mark as not visible. Nests in deep burrows, beyond direct observation will require inspection with a burrowscope.
- Long transponder readers are required to record IDs of marked birds in deep burrows, travelling to or from the nest, or by using an in-situ hoop reader left at the burrow opening.
- Clean equipment, boots, soiled bags/clothing with a broad-spectrum disinfectant, such as F10/Sterigene between sites and at the end of each day.

### Moulting Birds

- Moulting birds may be found in burrows December-April and are at their most vulnerable and extra consideration should be taken to reduce undue stress and disturbance.

### Other

- If required, remove any hazardous items from the nest if you can do so without causing undue stress.
- Report any sick or injured wildlife to the DOC Hotline (0800 362 468) or your local wildlife rescue organisation if available. Establish with your local DOC contact what protocols to follow if dead penguins are found.

## Equipment

- Smartphone with NZPI monitoring app
- Map, GPS unit or smartphone with nest locations
- Gloves
- First aid kit
- Hand sanitiser
- Torch/ headtorch
- Burrowscope
- Long FDX-B Scanner
- Hand-Held FDX-B Scanner (optional)
- F10/Sterigene (for disinfecting gear)
- Rubbish Collection Bag

## Data Recording Data to be recorded using the NZPI Monitoring App

### Nest ID

1. Date
2. Name
3. Photo (*update each season*)
4. Site
5. GPS coordinates
6. Type e.g. nest box, cave, vegetation
7. Observer name
8. Notes

\*Nest locations can be viewed under "Map View"

### Monitoring Data

1. Nest ID
2. Date/time
3. Observer name
4. Nest activity (i.e. loafing adult(s), eggs/chicks present, moulting)
5. Number of adults
6. Adult ID (transponder no.; if marked)
7. Nest contents (no. eggs/ chicks)
  - Chick ID (transponder no.; if marked)
  - Chick status
8. Interaction (e.g. passive, burrowscope, marking, uplifted)
9. Photo of any unusual/concerning nest contents
10. Notes

### Re-sighting Data (*birds not associated with a nest*)

1. Bird ID
2. Date and time
3. Site (e.g. Pilot's Beach)
4. Location (GPS coordinates)
5. Observer name
6. Bird status (i.e. dead, loafing, commuting, uplifted)
7. Photo (if using NZPI monitoring app)
8. Notes

## Marking

### Handling & Transponding Kororā

- All persons handling and transponding must be L2 or L3 certified (unless working under direct supervision of an L3) & follow best practice guidelines as per monitoring protocol. Handling time is always kept to the minimum & avoid lifting birds that are on eggs or young chicks.
- Aim to transponder all adult birds found at the time of the first monitoring rounds. The remaining unmarked birds will be transpondered throughout the season. Kororā found within the study colony should only be transpondered providing they meet minimum age & condition requirements.
- Chicks should be transpondered ca. 6 weeks after hatching. When marking chicks, it is vital that Nest ID is recorded otherwise family lineage cannot be determined.
- Clean equipment, boots, soiled bags/clothing with a broad-spectrum disinfectant, such as F10/Sterigene between sites & at the end of each day.

### Procedure

- Set up your work area & prepare your equipment prior to marking to reduce handling time. Scan the PIT-TAG to ensure the number corresponds to the barcode number.
- Bird is retrieved & held securely and comfortable in a clean restraining bag. Ensure that all measurements and samples are taken before transponder injection. Scan the bird with a transponder reader thoroughly to ensure it does not already have a transponder.
- Ensure hands are clean/sanitized & the bird is secure/calm. Pinch skin longitudinally at the back of neck to ensure there is adequate skin folds, expose the skin & sanitise the insertion site.
- Inject the needle in-between the skin folds & implant tag, then gently remove the needle, while maintaining slight pressure on the insertion site & hold with a cotton pad. Dispose of the used needle into a sharps container immediately.
- Check the insertion site and apply a small amount of liquid bandage and scan the bird to ensure the tag reads. If capturing multiple birds outside of the burrow, mark with a small amount of twink on top of the head in the direction of the feathers to prevent recapture.
- Release the bird directly to its box/burrow or capture site (place down low to the ground).

## Equipment

- Tier 1 & 2 monitoring equipment
- PIT tags (Trovan 8 or 11mm)
- Insertion gun (Trovan IM-3000C pistol-grip implanter or reusable plastic syringe)
- Long FDX-B transponder reader
- Sharps container for used injection needles
- Alcohol & pipette/Betadine/cotton pad
- Tissue Glue/Liquid Bandage/Opsite
- Restraining bag ('weigh bag')
- Vernier callipers
- Pesola spring balances (1000g & 2500g)
- Twink (to prevent recapturing marked birds twice if not affiliated with nest sites)
- F10/Sterigene (for disinfecting gear)

## Data Recording Data to be recorded using the NZPI Monitoring App

### Monitoring Data

1. Nest ID (*minimum 3 characters & unique*)
2. Date and time
3. Observer name
4. Nest activity (i.e. loafing adult(s), eggs/chicks present, moulting)
5. Number of adults
6. Adult ID (transponder no.; if marked)
7. Nest contents (no. eggs/ chicks)
  1. Chick ID (transponder no.; if marked)
  2. Chick status
8. Interaction (i.e. passive, burrowscope, marking, uplifted)
9. Photo of any unusual/concerning nest contents
10. Notes

### Transponder Insertion Data

1. Transponder number
2. Date and time
3. Region (e.g. Otago Peninsula)
4. Location (e.g. Pilot's beach)
5. GPS coordinates
6. Nest ID (if attached to nest)
7. Tagger name
8. Weight
9. Bill depth & length for sexing
10. Age (i.e. chick/ adult)
11. Bird status (i.e. breeding, non-breeding, pre-moult, moulting, chick in nest)
12. 'Mug shot' (if using NZPI monitoring app)
13. Notes

## Trail Camera Deployment

### Deployment

- Cameras should be set up to record access paths, where penguins travel between the sea and the colony. Multiple cameras can be used to cover multiple access paths.
- Strap the cameras securely to existing material (branch, trunk, rock) or fix to a stake in the ground.
- Number the cameras (if not already permanently numbered) and record their GPS position.
- Ensure cameras are not easily visible from public access paths to prevent theft; alternatively, cameras can be secured with steel cable and padlocks or a security box.
- Disguise the camera if possible by using branches, foliage. If needed an empty trap tunnel can be used to store the camera (see image reference below).
- Set cameras to record 20 seconds of video each time they are triggered, with a 5 second trigger interval.
- Batteries and SD cards need to be replaced every 7-14 days; do so in the middle part of the day to avoid the most active penguin times.
- The cameras run on 8x AA batteries; an allocation of 16 batteries per camera will allow for rotation of charged batteries and keep the cameras running.
- 2x SD cards should be allocated to each camera and marked accordingly, e.g. camera #1 should have SD cards #1A and #1B.
- Transport SD cards and batteries securely in a sealed container.

### Other

- If required, remove any hazardous items from the area if you can do so safely.
- Report any sick or injured wildlife to the DOC Hotline (0800 362 468) or your local wildlife rescue organisation if available. Establish with your local DOC contact what protocols to follow if dead penguins are found.

## Equipment

- First Aid Kit
- Notebook/Pencil
- Trail cameras
- SD cards (min. 32GB; 2 per camera)
- Rechargeable Eneloop AA batteries (12 per camera)
- AA battery charger
- Stakes (optional, for trail camera placement)
- Empty Trapping Tunnel (optional)
- Hand-Held FDX-B Transponder Reader (for scanning dead penguins)
- Rubbish Collection Bag optional)
- F10/Sterigene (for disinfecting gear)

## Video Playback & Data Recording

Data is to be recorded when reviewing trail camera footage and should include the following:

1. Date (visible on the video footage)
2. Time (visible on the video footage)
3. Species observed
4. Number of individuals
5. Same animal yes/no (was this the same animal observed on the previous clip?)
6. Direction of travel (coming ashore/ going to the sea, stationary)
7. Name of observer (the individual reviewing the footage)
8. Notes



## Footprint Surveys

### Surveys

This is a non-intrusive survey method and can be good for indicating presence of Kororā/Little Penguins at a particular site.

- Ensure you have considered health & safety, weather and ocean conditions before surveying.
- Sandy beach footprint surveys are best undertaken in the early morning before footprints weather and become less visible.
- On shallower beaches survey times must coincide with low tides before footprints are washed away. The firmness of the sand will also determine how well-defined footprints will be.
- Repeat sandy beach surveys monthly from the beginning of June until the end of February.
- Record the number and direction of tracks, take photos and log the location using GPS software.

### Identification *(see reference image below)*

- 5.5cm in length
- Chunky toes/claws
- Visible heel
- Angle of all toes less than 75°
- Usually tracking straight up and down the beach

### Other

- If required, remove any hazardous items from the area if you can do so safely.
- Report any sick or injured wildlife to the DOC Hotline (0800 362 468) or your local wildlife rescue organisation if available. Establish with your local DOC contact what protocols to follow if dead penguins are found.

## Equipment

- First aid kit
- Ruler/ tape measure
- Footprint guide
- Field notebook or recording sheet
- Camera
- GPS Software e.g. iNaturalist App, GPS, Google Maps
- Hand-Held FDX-B Transponder Reader *(for dead penguins)*
- Rubbish Collection Bag (optional)
- F10/Sterigene (for disinfecting gear)

## Data Recording

Data is to be recorded when undertaking footprint surveys and should include the following:

1. Date
2. Time
3. Location (GPS co-ordinates)
3. Number of trails
5. Direction of travel (coming ashore/ going to the sea)
7. Name of observer (the individual undertaking the survey)
8. Notes

