



NEW ZEALAND  
**PENGUIN  
INITIATIVE**

**Kororā/Little Penguin Workshop**  
Introduction to Kororā Conservation

**Kororā National Monitoring Programme**  
Citizen science gaining nationwide knowledge & protecting colonies

**Biology & Behaviour**  
Life stages/activity & habitats

**Getting Started**  
Health & safety, permissions

**Monitoring**  
Footprints, trail cams, counts, nest checks, marked populations, equipment,

**Nest Boxes**  
Designs & placement guidelines

**Threats & Habitat Management**  
Key threats & management methods

**Rescue Basics**  
Sick, Injured & starving kororā

**Advocacy & Community Engagement**  
Educating communities

**Collaboration & Networking**  
Sharing knowledge & monthly Kororā Korero

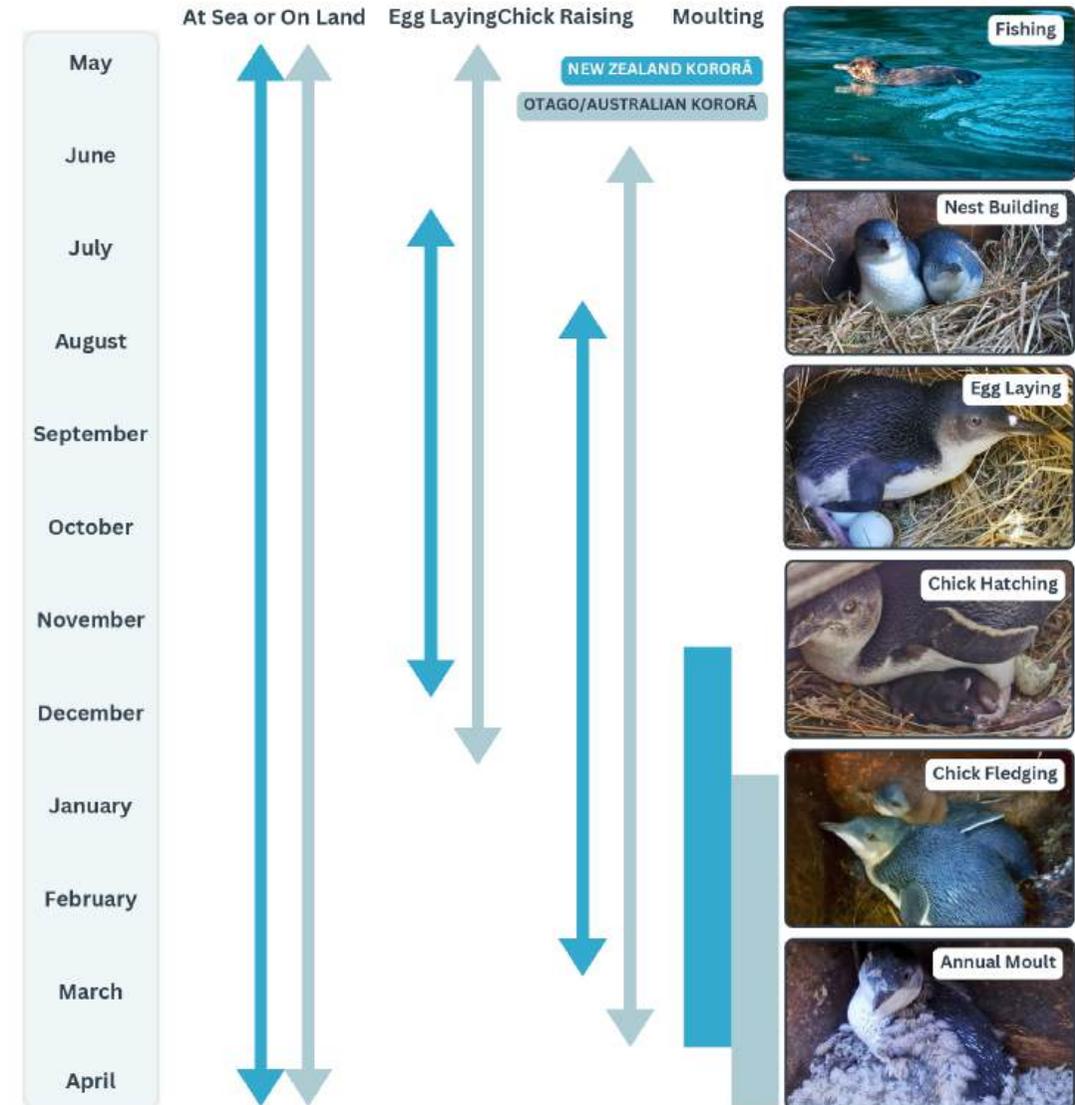


Resources available at  
[www.nzpi.nz](http://www.nzpi.nz)

# KORORĀ/LITTLE PENGUIN

## Annual Cycle

Kororā can be found on land at anytime of the year. Extended periods of time spent at sea, are observed in late summer and throughout autumn during their post-moult/pre-breeding phase. Breeding usually commences in late spring/early winter, and timing can be flexible depending on food availability. Timing is usually synchronised, with pairs laying eggs and raising chicks at similar times. Kororā can replace failed clutches (eggs/chicks don't survive) and also produce multiple clutches within a breeding season, which makes them the most productive seabird in the world. Once a year they must replace all of their feathers at once, during a catastrophic moult. They must remain on land for 2-3 weeks fasting and are not waterproof. The moulting phase is the most vulnerable time of year for adults.



Females can lay a second clutch if their first clutch fails (replacement clutch). Kororā in Otago (and Australia) can also lay another clutch after successfully fledging chicks (double-brooding). Occasionally a third clutch can be laid (triple-brooding). Double brooding has also recently been recorded in some North Island colonies.

# KORORĀ/LITTLE PENGUIN Chick Development

## Annual Moult

Kororā chicks hatch after approximately 5 weeks of incubation. The chicks will hatch 2-3 days apart and are guarded by one of the parents during their first few weeks (guard stage). The parents will swap parenting duties to take turns fishing. Once the chicks are big enough to keep themselves warm, they require more food and will be left alone during the day (post-guard stage), so both parents can go fishing. Chicks grow rapidly over 8 weeks, and their feathers change throughout development. Once they are blue and waterproof, they are ready to fledge!

*Kororā undergo annual catastrophic moults over 2.5 weeks*

Kororā feathers wear out over time & have to be replaced every year to ensure they can maintain waterproofing, which helps keep them warm. During moulting, they can't go fishing at sea & need to gain lots of condition before they start. This helps to ensure they will have enough fat reserves to fast for the entire duration & to survive once they've finished the moult. Approximately half of their initial body weight is lost through the moulting process, and they come out with new shiny bright blue feathers. Post-moult, Kororā will spend lots of time fishing & regaining condition ahead of the next breeding season.



Some siblings develop at a different pace and the dominant chick may receive more food, develop faster and fledge earlier. The other sibling usually catches up and fledges a few days later. Once they've fledged, they will spend time lots of time in the ocean, learning how to hunt. Juvenile mortality is often high, which makes survivors into adulthood, very important for sustaining colonies. Chicks will often return to their natal area to moult and breed. They will undertake their first moult after one year and start breeding from 2-3 years of age.

This is a reference guide based on data from Otago. Regional differences in average weights throughout moult stages may apply & are influenced by food availability during the pre-moult phase.

# KORORĀ/LITTLE PENGUIN

## Signs of Activity

Kororā leave a number of signs to indicate that they are active in an area. Pathways of flattened vegetation are often created throughout dunes/grasses, where Kororā have been walking. In sandy or soil-based habitat, often there will be small tracks from their chest/abdomen rubbing amongst substrates. Guano (poo) is one of the most obvious signs that they are present and it is very smelly. Guano can be found along their pathway towards reaching their burrow/nest box, often under boulders or on top of rocks/stones, amongst vegetation or on sand. The entrance of a burrow or nest box can have guano and is clear of vegetation and/or cobwebs when it is in use. Flies are often outside, particularly when there is lots of activity and chicks are present. Kororā shed 1000's of feathers during their annual moult, that often spill out of the entrance.



Guano & Moulting Feathers



Burrow Entrance Clean, No Cobwebs, Soil Disturbed



Tunnels Through Sticks/Vegetation



Flattened Vegetation Pathway



Guano on Rocks/Sand/Soil



Guano Under Structures



Flattened Vegetation "Bowls"

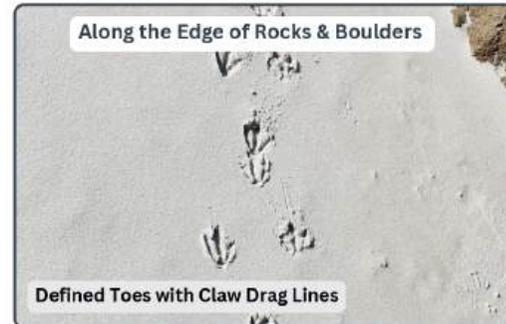


Footprint Tracks

Kororā burrows amongst coastal vegetation/soil/dunes can be very fragile & caution needs to be taken when walking, to prevent burrow trampling or collapse. Natural burrows may need careful management to ensure the general public & dogs don't cause damage or harm in the colony.

## Footprint Tracks

Kororā footprint tracks can be observed along dunes, bays and estuaries and can help us understand more about colonies. Tracks are in a direct line, usually heading straight to sea or onto land - towards rocks, vegetation or structures that provide cover. Sometimes they follow along waterways and tide lines. Kororā are small, with a narrow gait and will often utilise pathways/tracks to make their travel on land easier. They will often follow the same pathway, unless something blocks their path. Despite their small size, they can climb very well and live in burrows at high elevations or far inland. Kororā come ashore after dusk & leave before dawn. Throughout spring/early summer adults are travelling between land & sea often, to raise their chicks and is the easiest time of year to find tracks in an area for the first time. Early morning surveys undertaken at low tide/outgoing tide, during periods of fine weather are best for identifying tracks (before people, dog and shorebirds are around).



Along the Edge of Rocks & Boulders

Defined Toes with Claw Drag Lines



Gathering Under a Pohutukawa Tree

Overlapping Tracks



Along the Edge of Coastal Vegetation

Defined Toes



To & From Rocky Shores/Seawalls

Consistent Gait & Direct Line of Travel



To & From Caves/Crevices

Separately Defined Tracks



Navigating Driftwood/Large Obstacles

Defined Toes & Heels, Narrow Gait

### Key Characteristics of Kororā Footprints:

- Feet approximately 5.5cm long
- Angle of all toes less than 75°
- Gait is narrow with feet approximately 8.5cm apart & turned slightly inwards
- Distance between steps is approximately 11-12cm
- Toe drag lines present & sometimes also flipper and tummy drag lines
- Tracks form a relatively straight line often directly to/from the sea

# KORORĀ/LITTLE PENGUIN

## Natural Burrows

Kororā nest and moult in cavities that provide dry overhead cover. They will often occupy "ready-made" cavities but can also dig and tunnel if needed. Burrows can be found in a variety of coastal habitats at beaches, bays, rocky shores, estuaries, harbours, river mouths and also in urban environments and on private property. They can travel far inland and climb to high elevations to find a suitable burrow.



Rockstacks/Boulders



Clay Banks



Dune Grasses



Tree Roots/Soil



Driftwood Stacks



Caves/Crevices/Tunnels



Pasture



Harakeke/Flax Bushes

Kororā are faithful to their breeding and moulting sites and will often return to the same burrow year after year. They are philopatric in nature: many chicks return to their natal site to moult and often start breeding there aged 2-3 years old.

## Artificial Burrows

Kororā will breed and moult in or under artificial structures that provide shelter with overhead cover. They may use structures in a variety of coastal habitats at beaches, bays, rocky shores, estuaries, harbours, river mouths and urban environments, including private property. They can travel far inland and climb to high elevations to find a suitable place. It is important to regularly inspect artificial habitats that may be utilised to ensure Kororā aren't disturbed or harmed during breeding and moulting. Coastal property owners should be made aware that Kororā may be living in their backyard, garden, sheds or woodpiles. Nest boxes can be placed to make safe breeding and moulting opportunities available but require careful design and placement to ensure they benefit Kororā long-term.



Drainpipes/Culverts



Coastal Rock Revetments/Seawalls



Pathways/Bridges/Platforms



Concrete Slabs/Pads/Building Platforms



Woodsheds/Stacks



Containers/Sheds/Huts/Sleepouts



Nest Boxes



Parked/Unused Boats/Kayaks

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## Nest Boxes

Nestboxes can provide additional nesting and moulting opportunities. With appropriate design and placement, they can provide protection against predators, including dogs and also help mitigate habitat loss. Especially dunes, soil or shallow vegetation, where natural burrows can easily collapse or become trampled.



Nest boxes should be tamper proof, so they can't be opened by the public. Screws are recommended. They should not have a floor to enable natural digging and nesting behaviour. It is very important that the nest box entrance is wide enough to allow a pre-moult penguin to fit through without getting stuck. Securing boxes to the ground can prevent dogs from upturning.

## Nest Box Placement

Kororā nest boxes require some placement considerations: the box needs to be horizontal on flat ground or dug into a slope. A flat area or veranda in front of the entrance allows for socialising. It needs to be well drained, shaded, near access paths facing them, disguised and away from creeks and landslides. Boxes should be installed in areas not easily accessible to public, and well disguised to reduce disturbance.



Kororā will take some time to find a new box and move in. If the box remains unused for 2-3 years, it's time to move it somewhere else. A good start is to find moulting feathers in autumn and select a suitable site near there. Placing a nest box next to a natural burrow may also persuade them to choose the box for the next breeding attempt.