

## Australian National University

Image credit: Fernanda Alves

# Forty-spotted Pardalote

# Feather dispenser guidelines

Guidelines on building, deploying and maintaining feather dispensers to improve Forty-spotted Pardalote breeding outcomes.



### **BACKGROUND INFORMATION**

### Introduction

Forty-spotted Pardalotes (*Pardalotus quadragintus*) are small, cavity nesting and leaf gleaning species, endemic to Tasmania in forests where their preferred food tree, white gums (*Eucalyptus viminalis*) occur. The species is now largely confined to two offshore Islands (Bruny and Maria), and small forest patches in southeast Tasmania. Forty-spotted Pardalotes are listed as endangered under the *EPBC Act* and the *Tasmanian Threatened Species Protection Act* 1995.

A native ectoparasite has been identified as a new threat to forty-spotted pardalotes, severely impacting breeding success in some parts of the species range. Dr Fernanda Alves from ANU conducted a study (Alves *et al.* 2021) where she used the natural behaviour of Forty-spotted Pardalotes to use feathers to line their nests and offered adult birds the opportunity to 'self-fumigate' their nests by supplying feathers treated with insecticide. The results of this experiment were very promising, pardalotes readily incorporated the experimental feathers in nest building, and survival of hatchlings was significantly higher in nests lined with treated feathers (95%)

### Additional Information

For more information about Forty-spotted Pardalotes, visit the Tasmanian Threatened Species Link Fortyspotted Pardalote - Threatened Species Link and The Commonwealth's SPRAT database Pardalotus quadragintus — Forty-spotted Pardalote (environment. gov.au)



Image credit: Fernanda Alves



For more information on NRM South's partnership project with ANU to protect the Forty-spotted Pardalote, follow the QR code.

The purpose of these guidelines is to describe how to build and maintain feather dispensers, and to provide advice about where and when they should be deployed.

### **CRITICAL INFORMATION**

### **Wildlife Permits**

Before embarking on building and installing feather dispensers, ensure that you have any necessary permits, such as: . Scientific

- Animal Ethics
- Threatened Species

### Approval to access a site to install dispensers

If you are planning to access a property or site that is owned or managed by a separate person or organisation, ensure that you have formal approval to do so. If, for example, the land is managed by the Tasmanian Parks and Wildlife Service, a Reserve Activity Assessment is likely to be required.

### **Consider all potential impacts of installing feather dispensers**

- Is there a risk your activity will disturb nesting birds or impact in another way?
- Is there a risk that you could inadvertently create a biosecurity impact?
- Consider any safety risks to yourself or others.

We recommend a risk assessment to identify all potential risks and how they can be managed or mitigated. We also recommend that you use best practice guidelines for environmental hygiene: www.nrmsouth.org.au/biosecurity

### Feather dispensers are not a panacea!

The parasitic fly identified as impacting breeding Forty-spotted Pardalotes (*Passeromyialongicornis*) is a **native species, endemic to Tasmania.** Therefore the mitigation strategy described is not intended to eliminate the fly, but simply to reduce its impact to the endangered Forty-spotted Pardalote by improving breeding success

**Potential environmental impacts.** Avian Insect liquidator is a bird-safe insecticide. Nonetheless, we are taking insecticide to a natural environment, therefore extra care needs to be taken to not impact other species. We tested and built the final version of the feather dispenser used in the experiment described in Alves *et al.* (2021) with double wire-mesh with an offset between meshes to prevent feathers from being blown by the wind. This step should be carefully followed during the building phase as we want pardalotes to take the feathers into their nests. By the end of their breeding period the insecticide will have degraded.

The impact only occurs at some sites. Research on the threat of parasitism on the reproductive success of Forty-spotted Pardalotes is ongoing and there are still several unknown aspects of this host-parasite system. We know that the reproductive success of Forty-spotted Pardalotes can be severely impacted by parasitism on north Bruny Island and Tinderbox, so the **use of feather dispensers are currently recommended for these sites only** (at the time of writing this guidelines – July 2023). Future research is needed to investigate the prevalence of the parasitic fly in other areas.

### Feather dispensers are a short-term solution.

The use of feather dispensers is recommended as a management strategy to buy us time until we better understand the ecology of the parasitic fly, with the aim to investigate other ways to reduce this threat.

### Feather dispensers require ongoing maintenance

Although this is a simple and cost-effective tool, it requires maintenance, therefore planning is crucial to make sure that feather dispensers are checked (and repaired if needed) during the breeding season (i.e. August to January).

Contact the Department of Natural Resources and Environment Tasmania for clarification.

### **ASSEMBLING A FEATHER DISPENSER**

You can build feather dispensers using materials from hardware stores.

Both mesh wires should have the same length (27cm) but different heights (1 x 23 cm and 1 x 22 cm, so the mesh can be offset and avoids feathers being blown away by the wind.

### You will need

- 2 pieces of 1x1cm mesh wire
- String
- Cable ties
- Plastic saucers (we used 43 cm for the top and 20 cm for the bottom)
- Pliers
- A drill

# <image>

### MATERIALS REQUIRED



### Step 1: Form the holder











The holes will be used to pass the cable ties and the extra holes in the bottom saucer will serve as drainage, so rain water can flow.

















Making a knot near the hole stops the string from sliding through.



We also added tape at the bottom saucer to stick some feathers to act as a visual aid to attract the birds to the dispenser, but this step is not essential.





### Nesting material and bird-safe insecticide

For the nesting material, we used sterilized chicken feathers (which can be bought at pet stores) sprayed with Avian Insect Liquidator (1.25 g/L Permethrin, 6.25 g/L Piperonyl Butoxide, 20 mg/L Methoprene). This is a commercial bird-safe insecticide produced by Vetafarm (https://vetafarm.com.au/product/avianinsect-liquidator-concentrate/). Because of the large amount of feathers needed to fill a dispenser, we recommend using the concentrated form and diluting it before spraying (prepare a 5% solution by diluting with water; for example mix 50ml concentrate with 950ml of water). When first filling a feather dispenser, the easiest way is to have a big plastic box filled up with feathers and spray the feathers in the box and let them air dry before filling up dispensers.

There is no record of the insecticide causing irritation when handling, but we recommend the use of plastic gloves. Once feather dispensers are deployed in the field (see field recommendations below), insecticide can be re-applied by simply re-spraying the feather dispensers, with no need to remove the feathers. Feather dispensers should be re-sprayed with insecticide every six weeks because after this period it starts to degrade.



mage credit: Stuart Smith

### Feather dispenser deployment

Forty-spotted Pardalotes breed between August and January, so we recommend setting up dispensers in the field at the very beginning of August. At this stage (further research is being conducted on the spatial scale of feather dispenser placement), we recommend using feather dispensers near nest boxes. Dispensers can be hung in trees at a distance between 4-15m from nest boxes. Once feather dispensers are set up in the field, maintenance is required (e.g. repair feather dispensers after windy periods), and can also be done at the same time feather dispensers are re-sprayed (i.e. every six weeks). Feather dispensers can be re-sprayed for the last time by mid-December as this is the time the last incubation activity for the season is recorded. Dispensers can be taken down at the end of the season, but a string can be left on the tree for the following season to save setting up time.

### Acknowledgments

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### Reference

Alves F., Langmore N., Heinsohn R. & Stojanovic D. (2021) 'Self-fumigation' of nests by an endangered avian host using insecticide-treated feathers increases reproductive success more than tenfold. Animal Conservation 24, 239–245.