



Fauna Technical Note No. 3: Identifying swift parrot breeding habitat



The Fauna Technical Note Series provides information for Forest Practices Officers on fauna management in production forests. These technical notes are advisory guidelines and should be read in conjunction with the requirements of the Forest Practices Code. The planner will use expert judgement and available information to determine the extent and nature of field survey work required to meet decision-making requirements.

The technical notes can be accessed on the Forest Practices Authority's website: www.fpa.tas.gov.au

1. Introduction

The swift parrot (*Lathamus discolor*) is listed as Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the Tasmanian *Threatened Species Protection Act 1995*, and is a 'priority species requiring consideration' under the Tasmanian Regional Forest Agreement 1997. Consequently this species requires management under the forest practices system.

The swift parrot has very complex ecology.

- *Migratory*

Swift parrots breed over the summer in the forests and woodlands of some areas in Tasmania and migrate to mainland Australia over winter.

- *Unpredictable foraging requirements*

One of the main foraging resources for swift parrots are the flowers on *Eucalyptus globulus* (blue gum). *Eucalyptus globulus* flowering is highly variable in both space and time. This means it cannot be predicted where flowering events will occur in any given breeding season, and therefore it cannot be predicted where swift parrots will be breeding in any given year. Swift parrots will also feed on the flowers of *E. ovata* (black gum), as well as lerps, psyllids, pollen and honeydew.

- *Hollow-users*

Swift parrots breed in tree hollows and are selective in the size of hollow they will use. They prefer hollows located high in the trees that are deep and have narrow entrances. Anecdotal evidence suggests this type of hollow may be in high demand. Swift parrots often nest in aggregations, with the density of nests depending on the foraging resource available. Therefore a large number of suitable hollows may be required in an area to support breeding. These areas of suitable nesting habitat need to be located within a few kilometres of the foraging resource.

Swift parrots follow the flowering patterns of *Eucalyptus globulus* and breed in tree hollows in different parts of their breeding-range in different years. Each year the majority of the breeding Swift Parrot population may be concentrated within, and dependent upon, a limited number of areas where both flowering eucalypts and nesting hollows are available.

2. Swift parrot potential breeding habitat – overview

Swift parrots have more specific breeding-habitat requirements than those of most other forest-dependent birds in Tasmania. To successfully breed, they need flowering eucalypts (chiefly *Eucalyptus globulus* and *E. ovata*) on which to feed, and tree hollows in which to nest, and for these resources to be within a few kilometres (up to ten kilometres) of each other. **Thus, potential breeding-habitat comprises both potential foraging-habitat and potential nesting-habitat.**

Potential foraging-habitat comprises *Eucalyptus globulus* (blue gum) and/or *E. ovata* (black gum) trees that are old enough to flower. Swift parrots generally select the larger-diameter flowering trees for

foraging. This behaviour probably reflects the greater number of flowers available on larger trees, as well as their greater propensity to flower. Swift parrots have been observed foraging in flowering *E. globulus* in a variety of different environments and landscapes, including isolated trees in agricultural landscapes and residential areas, plantations, and areas of continuous native forest.

Potential nesting-habitat is considered to comprise of eucalypt forests that contain hollow-bearing eucalypt trees of any species. Nest trees typically contain multiple hollows, have a large trunk diameter (mostly > 70 cm diameter at breast height) and have signs of advanced senescence (i.e. contain dead wood).

Table 1. Ecological definitions of potential breeding-habitat ^{a,b}

Potential nesting-habitat	Potential foraging-habitat
Hollow-bearing trees in any eucalypt forest.	<i>E. globulus</i> and/or <i>E. ovata</i> capable of flowering.
Quality of nesting-habitat	Quality of breeding foraging-habitat
↑ Increases with:	↑ Increases with:
<ul style="list-style-type: none"> Density of hollows with appropriate characteristics Quality and quantity of accessible foraging-habitat 	<ul style="list-style-type: none"> Percentage cover of <i>E. globulus</i> &/or <i>E. ovata</i> Forest age A range of altitudes in an area ^c
↓ Decreases with:	↓ Decreases with:
<ul style="list-style-type: none"> Distance from foraging-habitat 	<ul style="list-style-type: none"> Distance from nesting-habitat

^a Availability and use of potential nesting-habitat and potential foraging-habitat in each breeding season is affected by the frequency, distribution and intensity of flowering events.

^b It is assumed that potential nesting-habitat and potential foraging-habitat will capture other foraging resources (e.g. lerps, leaf galls, other exudates) if retained in patches.

^c Eucalyptus globulus at higher altitudes flowers later, extending the foraging season.

3. Assessing swift parrot foraging habitat

Remote assessment

Indicative assessments of foraging habitat availability can be made using the TASVEG and GLOBMAP mapping layers, available from DPIPWE. Due to the scale and inadequacies in current foraging-habitat mapping, potential foraging-habitat density within operational areas may need to be largely identified by ground-based surveys.

Field assessment

The field definitions for swift parrot potential foraging habitat are provided in Table 2. These definitions can be interpreted by examining the relative availability of foraging trees. For example, when considering only trees with 40 cm diameter breast height (dbh) or greater, if one tree in two is a *Eucalyptus globulus* or *E. ovata* then the area is classified as high density potential foraging habitat. If one tree in five is a *Eucalyptus globulus* or *E. ovata* then the area is to be classified as medium density potential habitat. Forest patches are to be assessed at roughly a one hectare scale, but small patches of potential habitat can still be important for this species.

The definitions in Table 2 are provided as general guidance for forest planners. However, planners should consider that trees vary greatly in the quality of habitat they provide, with large trees able to

provide an important foraging resource even when there are few other foraging trees in the area. This means that areas of low density potential foraging habitat can still be very important for this species.

Stands of very young foraging trees (<40 cm dbh) may also provide important habitat for swift parrots, if not now then in the future. Planners may contact the FPA or Threatened Species and Marine Section (DPIPWE) if they require guidance on the importance of areas with young foraging habitat.

Table 2. Potential foraging-habitat density for ground-based assessment^a

Potential foraging-habitat density class	Description ^b
High	≥ 50% of the stems over 40cm dbh in any one hectare patch are foraging-trees ^c
Medium	20-49% of the stems over 40cm dbh in any one hectare patch are foraging-trees ^c
Low (dry forest)	1-19% of the stems over 40cm dbh in any one hectare patch are foraging-trees ^c
Low (wet forest)	10-19% of the stems over 40cm dbh in any one hectare patch are foraging trees ^c , except for the southern forest and south Bruny SPIBAs where the threshold is 1-19%
Negligible	All areas that do not meet the above definitions

^a Potential foraging habitat does not include *E. globulus* plantations. Plantation forest may have a very large percentage cover of *E. globulus*, but due to age, tree density and genetic strain plantations are generally unlikely to provide a substantial foraging resource for the swift parrot.

^b Forest type, i.e. wet or dry, is to be determined in accordance with the FPA Forest Botany Manual. In circumstances where the definitions provided do not meet the intent of Swift Parrot management prescriptions, documentation and explanation can be provided to the FPA for consideration.

^c Potential foraging-trees are *E. globulus* and/or *E. ovata* ≥40 cm dbh.

4. Assessing swift parrot potential nesting habitat

Remote assessment

The FPA's 'mature habitat availability map' identifies areas as high, medium, low or negligible mature habitat availability. This layer is available from the FPA on request, or a map can be accessed from the mature habitat context tool on the FPA website or from the Biodiversity Values Database web-map. Alternatively, mapping layers used in the construction of the mature habitat availability map can be assessed, as outlined in Table 3.

The mature habitat availability map is designed to be used to make landscape-scale assessments and may not be reliable for stand-level assessments required during the development of a Forest practices plan. At the stand-level the availability and distribution of hollow-bearing trees across a coupe or operation area is best determined from a ground-based assessment.

Field assessment

Table 3 also outlines the field-based definitions for potential nesting habitat. The classifications differ between wet and dry forest due to the difference in growth rates between these forest types. The likelihood of a tree containing a hollow useful for swift parrots increases with tree age and diameter. The habitat assessment definitions in Table 3 are based on tree diameter to maximise efficiency and facilitate auditing. However it is understood that in some instances tree diameter may not reflect habitat value. For example, some regrowth trees in wet forest can be over 100 cm dbh and some trees smaller than 70cm dbh in dry forest can contain hollows used by fauna. Under these circumstances evidence can be provided to the FPA (e.g. photographs) to verify which habitat category the forest should be classified as. Trees most likely to provide nest hollows that can be used by swift parrots are old, large in diameter, senescent (i.e. contain lots of or large dead branches) and have major forking in

the crown. The FPA booklet 'Tree hollows in Tasmania' is available on the FPA website and provides further guidance in identifying potential nest trees.

Nesting habitat assessments should be conducted at approximately a 1 ha scale. It is expected that nesting habitat assessments be conducted during normal coupe assessments. For planners who would like a more formal assessment process, line transects can be conducted using the survey form provided in appendix 1 of this technical note. As with any habitat mapping it is understood that it can be difficult to ensure every hectare of the map is accurately assessed, but planners need to be confident with the standard they have achieved.

Table 3. Potential nesting-habitat density for desktop and ground-based assessment

Potential nesting-habitat density class	Mapping layer categories for desktop assessment ^a		Field-based assessment criteria ^c	
	PI-type 'E' class (mature eucalypt crown cover)	SenCode mapping layer ^b	Dry forest	Wet forest
High	a and b (>40%)	All except nil	At least 8 trees/ha are over 100 cm dbh.	At least 15 trees/ha are over 100 cm dbh or 8 trees /ha over 150 cm dbh
Medium	c (20-40%)	All except nil	At least 8 trees/ha are greater than 70 cm dbh.	At least 8 trees/ha are greater than 100 cm dbh.
Low	d and f (1-20%) OR a, b and c (>20%)	All categories Nil	Trees over 70 cm dbh are present, but comprise less than 8 trees/ha.	Trees over 100 cm dbh are present, but comprise less than 8 trees/ha.
Negligible	PI-types with no E class density	All categories	There are no eucalypt trees over 70cm dbh	There are no eucalypt trees over 100 cm dbh

^a These are the mapping categories used to construct the Mature Habitat Availability Map (www.fpa.tas.gov.au). Both crown cover and senescence assessments are based on aerial photo interpretation of the forest canopy and are depicted in the PI-type and SenCode mapping layers respectively.

^b Senescence categories are the proportion of mature crowns that show visible signs of senescence.

^c A size limit is used to facilitate rapid assessments of mature trees. However, it is acknowledged that in some areas regrowth trees can be ≥ 100 cm in diameter and some areas smaller trees can provide mature forest features such as hollows. In circumstances where the definitions provided do not meet the intent of swift parrot management prescriptions, documentation and explanation can be provided to the FPA for consideration.

5. Distribution of swift parrot breeding habitat

Results from nest surveys suggest swift parrots nest within 10 km of foraging-habitat.

In spring swift parrots take up residence along the south-east coast of Tasmania, from Binalong Bay in the north to Recherche Bay in the south, including the Tasman and Forestier Peninsulas, and including the neighbouring islands of Maria and Bruny. This breeding distribution largely coincides with the natural distribution of their main food-source *E. globulus*. There are outlying breeding populations of swift parrots along Tasmania's north coast - in the Gog Range, at Kelsey Tier near Devonport, parts of the Western Tiers, Dial Range, Mount Montgomery and Smithton.

Details on the distribution of swift parrot breeding habitat can be found at:

- The FPA Biodiversity Values Database (http://www.fpa.tas.gov.au/fpa_services/planning_assistance/advisory_planning_tools/Biodiversity_values_database)
- The Natural Values Atlas (<https://www.naturalvaluesatlas.tas.gov.au/pls/apex/f?p=200:101:716973651444787>)

6. Management of known sites and potential habitat

FPOs and forestry planners should consult the Threatened Fauna Adviser (2014) for management recommendations for swift parrot if the proposed operation falls within the swift parrot potential breeding range and the proposed operation area contains potential swift parrot habitat and/or known or suspected swift parrot nest site.

Details to supply to FPA Biodiversity Program if advice is required

In addition to standard details that are required as part of the biodiversity evaluation, the following details should be supplied:

1. Operational areas
 - Show the areas of the planned operations on an FPP planning map
2. Any known swift parrot records within 500 m of the coupe.
 - Show location of records from Biodiversity Values Database (or NVA)
 - Note any new observations of nesting activity
3. Foraging and nesting habitat density
 - Indicate on 1:10 000 vegetation map the areas of high, medium or low density foraging and/or nesting habitat

References

DPIPWE, 2010, *GlobMap, The swift parrot foraging habitat map*. Biodiversity Conservation Branch, Department of Primary Industries Parks, Water and Environment. Tasmanian Government. Hobart

Fauna Strategic Planning Group, 2009, *Interim Species Habitat Planning Guideline for the conservation management of Lathamus discolor (Swift Parrot) in areas regulated under the Tasmanian Forest Practices System*. Unpublished report to the Forest Practices Authority, Hobart, Tasmania.

Webb, M, Holdsworth, M & Voogdt, J 2007, *Nesting requirements of the swift parrot Lathamus discolor*, Unpublished report to the Department of Primary Industries and Water, Hobart.

Appendix 1. Mature Habitat Survey Assessment Sheet

This sheet can be used when surveying an area for nesting habitat, but use of this assessment sheet is optional. As an approximate guide, this sheet should be filled in for every PI type within the proposed operation and at least once for every 10 ha area.

Instructions for use:

- Establish or walk a transect. Use a hip-chain or GPS to estimate the length of the transect, and enter at (A) below.
- While walking the transect, scan the trees on either side and enter in the table below (section 2) the number of high, medium or low quality habitat trees observed.
- At the end of the transect estimate approximately how far from the transect line habitat trees could be assessed on average, enter at (B) below.
- Complete the rest of the form.

Coupe Name: Date of Survey: Surveyor:

PI-type: Survey No. of

GPS coordinates at start of survey:EastingNorthing

GPS coordinates at end of survey:EastingNorthing

Section One: Survey Area

(This section will establish the size of the plot used to assess mature habitat availability. At least half a hectare should be examined whenever practicable).

Transect length: _____ m (A)

Estimated average observation distance from transect: _____ m (B)

Total transect area ($A \times B \times 2 / 10,000$) _____ ha (C)

Section Two: Mature Habitat Survey

(This section is to be filled out during the nesting habitat survey. A tally should be kept of every potential habitat tree detected and the quality of the habitat tree should be classified according to estimated tree diameter as indicated below).

Tally of mature habitat trees		
High quality	Medium quality	Low quality
>100cm dbh dry forest, >150cm wet forest	70-100cm dbh dry forest, 100-150 cm wet forest	<70 cm dbh dry forest, <100 cm wet forest
Total: (D)	Total: (E)	Total: (F)
Density: (D / C)	Density: (E / C)	Density: (F / C)

Nesting-habitat category = _____

(The highest Density category that meets the definition outlined in Table 4 of the current technical note is the nesting habitat category for this survey area).

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