



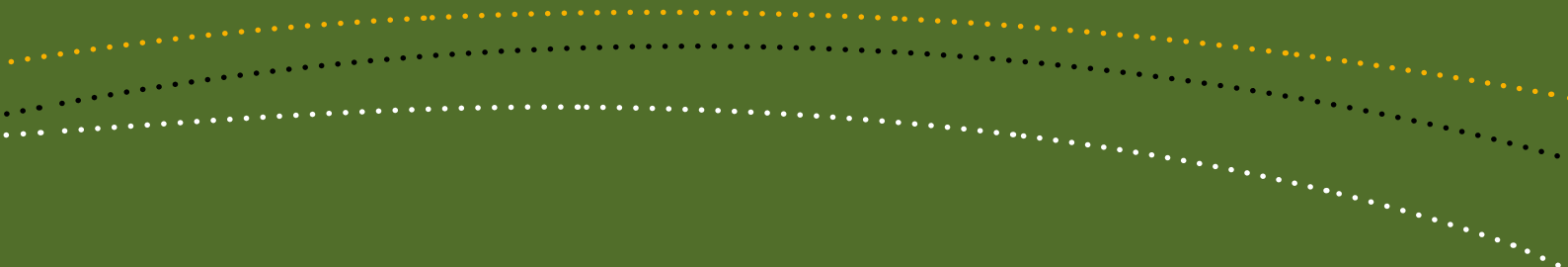
Australian Government

Department of the Environment,
Water, Heritage and the Arts



Significant impact guidelines for the endangered black-throated finch (southern) (*Poephila cincta cincta*)

Nationally threatened species and ecological communities
Background paper to the EPBC Act policy statement 3.13



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Contents

INTRODUCTION	2
CONSERVATION STATUS	2
ABOUT THE BLACK-THROATED FINCH (SOUTHERN)	3
Description	3
Distribution and abundance	3
Life history and ecology	4
Breeding	4
Habitat	5
Water	6
Seeding grasses	6
Trees	7
KEY THREATS AND RECOVERY PRIORITIES	7
Habitat loss, fragmentation and degradation	7
Grazing	8
Fire	8
Resource bottleneck	8
Drought	8
Additional threats	9
Recovery priorities	9
SIGNIFICANT IMPACT ASSESSMENT	10
Distribution maps	10
Significant impact thresholds	10
Actions likely to have a significant impact	11
MITIGATION MEASURES	14
Avoiding impacts	14
Minimising impacts	14
Managing habitat	15
Grazing	15
Wet season spelling	15
Other measures	15
SURVEY GUIDELINES	16
Description and similar species	16
Nests	16
Presence-absence surveys	17
Type of information to record	18
Impact assessment studies	19
Habitat assessment	19
REFERENCES	20

Introduction

This paper provides background to Australian Government *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) policy statement 3.13 – Significant impact guidelines for the black-throated finch (southern), *Poephila cincta cincta*, hereafter referred to as the policy statement. This background paper provides the biological and ecological context for the habitat areas, significant impact thresholds, and mitigation measures defined for the black-throated finch (southern) in the policy statement.

The information provided in this paper has been prepared based on the best available information, gathered from scientific literature, consultation with experts and an understanding of the application of the EPBC Act. Increases in knowledge will be accounted for in future policy revisions.



Conservation status

The black-throated finch (southern) is listed as endangered under the Australian Government EPBC Act. Listed threatened species and ecological communities are a matter of national environmental significance. Under the EPBC Act an action will require approval from the federal environment minister if the action has, will have, or is likely to have a 'significant impact' on a matter of national environmental significance.

The black-throated finch (southern) is also listed as vulnerable under Queensland's *Nature Conservation Act 1992*; and in New South Wales it is listed as endangered under the *Threatened Species Conservation Act 1995*. The listing of a species, subspecies or ecological community as a matter of national environmental significance recognises the importance of the matter from a national perspective, and does not replace listing under state, regional or local legislation or regulations.

Judgements may differ between Commonwealth, state and local decision making processes, due to the different scales of consideration. If your activity could affect the species or individual animals you should contact the relevant state/territory and local authorities regarding your obligations. If an action has received federal approval from the federal environment minister it may still require state/territory and local approval before commencing.



About the black-throated finch (southern)

Description

The black-throated finch (southern) is a small, thickset, granivorous (seed-eating) passerine (perching songbird) with brownish plumage, grey head and neck, and a prominent black bib. The information in this policy statement refers only to the subspecies, *Poephila cincta cincta*, known as the black-throated finch (southern), or the parson's finch.

The black-throated finch (southern) closely resembles the northern subspecies *Poephila cincta atropygialis*. It is distinguished from the northern subspecies by its white rump and richer brown plumage, while *P. c. atropygialis* has a black rump and duller plumage.

Distribution and abundance

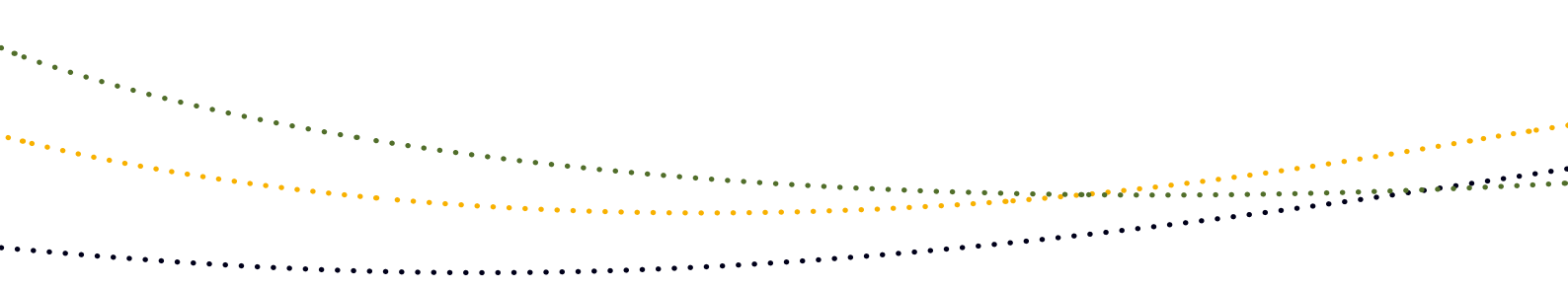
The black-throated finch (southern) was formerly distributed between the Atherton Tablelands in north Queensland, and the Northern Tableland and north-west slope regions of New South Wales (Baldwin 1975; Baldwin 1976; McCutcheon 1976; Zann 1976; Ley & Cook 2001; Higgins et al. 2006). The subspecies range is estimated to have contracted by 53 to 83 per cent in the last 20 years (Garnett & Crowley 2000; TSSC 2005; BTF RT 2007; NRA 2007a), and apart from a lone record near Stanthorpe in southern Queensland, the subspecies is now considered to extend only as far south as Rockhampton. The black-throated finch (southern) is currently only known to occur around the Townsville region and at scattered sites in central-eastern Queensland (BTF RT 2007).

In New South Wales the black-throated finch (southern) was formerly widespread and reasonably abundant in the Northern Tableland



and North-West Slope Regions (Gould 1972; Morris et al. 1981; Cooper & McAllan 1995; Ley & Cook 2001). In the past 15 years there have been only three published records of the black-throated finch (southern) in New South Wales. These have been at Swan Brook in 1992 (Morris 1994; Morris & Burton 1994), Pindari Dam near Ashford in 1994 (Morris & Burton 1996; Ley & Cook 2001) and at Bukkalla in 1994 (Morris & Burton 1996). There have been no reliable records in New South Wales since 1994 and targeted searches undertaken in northern New South Wales in 2000 failed to find any black-throated finches (Ley & Cook 2001).

The subspecies was not recorded south of Rockhampton in the Birds Australia atlas survey which ran from August 1998 to July 2002. The major cause of the initial subspecies decline is believed to have been the introduction of pastoralism in the early 20th century and the associated changes in fire regimes and grazing (TSSC 2005). Garnett and Crowley (2000) estimated that there are 20,000 breeding individuals and that the subspecies is estimated to have an area of occupancy of 5000 km². However, NRA (2007a) believes that there are no reliable estimates of total population size for the black-throated finch (southern).



The black-throated finch (southern) is locally common at a number of rural and semi-rural sites around Townsville and Charters Towers. The density of human occupation and associated disturbances are critical factors in determining the co-existence of black-throated finches (southern). There has been insufficient intensive research in other areas to confidently estimate populations. Other colonies occur scattered through the northern brigalow belt and desert uplands (south and southwest of Townsville, respectively); there are also records within the last 10 years from the Einasleigh Uplands and wet tropics bioregions (BTF RT 2007).

Life history and ecology

Most studies on the black-throated finch (southern) have occurred around the Townsville region and the following information on the subspecies may not account for life history and ecology variations in other parts of the subspecies range. Most of the information below has been collated or collected by NRA (2007a).

The black-throated finch's (southern) diet consists primarily of seeds from native and introduced grasses, however, occasionally they consume invertebrates such as insects and larvae (Mitchell 1996; Higgins et al. 2006). Typically the subspecies forages on seed that has fallen on the ground, although seeds from the inflorescence (seed-head) may also be taken directly (Zann 1976; Mitchell 1996). The seed is usually removed from the inflorescence by perching on grass stems and lowering them to the ground using their weight before individually removing seeds (Zann 1976; Mitchell 1996). There are numerous observations of birds feeding along graded firebreaks adjacent to intact habitat areas.

The subspecies is described as highly social and is usually found in pairs or small flocks of up to 30 birds throughout the year (Zann 1976;

Longmore 1978; Passmore 1982; Higgins et al. 2006; NRA 2006). Larger flocks of up to 160 birds have been recorded during the non-breeding season (Mitchell 1996). More recent observations have recorded occasional flocks of more than 100 birds in the Townsville coastal plain and desert uplands.

The black-throated finch (southern) is a sedentary or resident bird. During the breeding season birds typically stay close to the nesting site and make only small daily movements between foraging sites (Mitchell 1996; Higgins et al. 2006; NRA 2006; NRA 2007a). During the non-breeding period, these movements may increase up to three km a day (Mitchell 1996). Larger-scale movement may be made in response to drought, in order to access available water sources (Passmore 1982; Mitchell 1996; Ley & Cook 2001; Higgins et al. 2006; NRA 2006).

Breeding

Breeding can occur throughout the year under optimal conditions (Mitchell 1996; Higgins et al. 2006; NRA 2007a). In the Townsville area, breeding typically occurs during the wet season, usually between February and May (Mitchell 1996; Higgins et al. 2006; NRA 2007a). Clutch sizes are on average five eggs, however, can range from three to nine eggs (Higgins et al. 2006). Offspring reach sexual maturity at six months and in captivity the subspecies is known to live on average to five years (Fielding 2004; Higgins et al. 2006). The subspecies breeds quite prolifically in captivity (Fielding 2004).

Black-throated finches (southern) tend to form loose colonies and multiple nests may be found in a single tree (Higgins et al. 2006; NRA 2006; NRA 2007b). Nests may also be built in neighbouring trees within the colony, usually less than 50 m from other nest trees (Higgins et al. 2006; NRA 2006) and on occasion an outlier

may be up to 250 m from the main colony (based on preliminary data from honours research project in Townsville; Nicole Isles) (NRA 2007b).

The minimum area of nesting habitat required to sustain a viable breeding colony is unknown (NRA 2007a). Most known nesting colonies are connected to larger areas of remnant vegetation. Following observations of a single colony, it has been suggested that a minimum remnant habitat patch of 40–50 ha within 500 m of a nesting colony may be required for that colony to remain viable (NRA 2006; NRA 2007a).

Nests are typically constructed with grass stems and feather or plant down lining (Higgins et al. 2006; NRA 2006), and are used for breeding and roosting (NRA 2007a). They are usually built at least four metres above the ground and in the fork or hollow branch of a tree (Higgins et al. 2006; NRA 2006). However, nests have also been recorded in large shrubs within one metre of the ground. Occasionally nests are constructed beneath active raptor nests, of species such as wedge-tailed eagle (*Aquila audos*), whistling kite (*Haliastur sphenurus*), swamp harrier (*Circus approximans*) and collared sparrowhawk (*Accipiter cirrhocephalus*) (Higgins et al. 2006).

Habitat

Black-throated finch (southern) habitat is broadly defined as grassy, open woodlands and forests, typically dominated by *Eucalyptus*, *Acacia* and *Melaleuca*. The subspecies prefers habitats that are adjacent to water sources or riparian strips (Baldwin 1976; NRA 2007a). Records from New South Wales and southern Queensland suggest that the subspecies inhabited riparian sites dominated by river sheoak (*Casuarina cunninghamiana*), rough-barked apple (*Angophora floribunda*) and yellow tea-tree (*Leptospermum flavescens*) (Baldwin 1975; Baldwin 1976; BTF RT 2007). Within this habitat,



black-throated finches (southern) require access to three key resources for survival and breeding:

- water sources
- grass seeds, and
- trees providing suitable nesting habitat.

The presence and configuration between and within these three key resources governs the distribution of the black-throated finch (southern). Any disruption to the connectivity between these resources will have a serious impact on an area's ability to sustain black-throated finch (southern) populations. While suitable nesting sites are likely to be relatively common in the landscape, the distribution and availability of water and foraging habitat is much more limited and will, in turn, limit the number of nesting sites available to the black-throated finch (southern).

Black-throated finches (southern) are very rarely observed in modified habitats such as gardens, yards or heavily grazed paddocks. However, the subspecies has been recorded foraging in modified habitats such as grassy unsealed roadsides, beneath power lines and in rail corridors where suitable seeding grasses exist (Mitchell 1996; NRA 2007a). The black-throated finch (southern) has also been recorded flying across roads and rivers and appears to be capable of travelling over uninhabitable sites if the distance is less than a kilometre

(NRA 2007a). Traversing across such sites may be easier for the subspecies if it has tall perches (20 to 30 m) near the inhospitable site to have clear views of the area before crossing (NRA 2007a).

Water

The lifecycle of the black-throated finch (southern) is dependent on the availability of both permanent and seasonal water bodies. Individuals need to drink at least daily and numerous times throughout the day during dry periods. Black-throated finches (southern) use both natural and artificial water sources, including wetlands, creek lines, dams, and stock troughs. Permanent water sources are the most critical limiting resource, as they provide refuge habitat during the dry season. Seasonal water sources are also important to the lifecycle of the finch, allowing greater access to areas of foraging and nesting habitat during the wet season. With the onset of the wet season and proliferation of seasonal water bodies and seeding grasses, the finches move from their dry season refuge into habitat surrounding these water sources. During the breeding season black-throated finches (southern) typically nest in trees located within 400 m of seasonal water sources (NRA 2007a), therefore the presence of suitable trees close to seasonal water sources is critical for the black-throated finch (southern).

Seeding grasses

Black-throated finches (southern) predominantly feed on fallen grass seed, and require year-round access to a variety of grass species. Foraging habitat and dietary preferences are thought to vary seasonally with changing food availability (NRA 2007a). During the breeding season (February to May in the Townsville region) when seeding grasses are abundant, finches preferentially forage in small areas near to



the nesting site (NRA 2007a). However, when conditions dry and grass seed abundance declines, individuals must forage progressively further abroad (up to three km (Mitchell 1996)). Larger areas of foraging habitat are therefore required to support finch populations through the dry season. In the Townsville region, there is believed to be a critical foraging resource bottleneck at the start of the wet season (November to December), when existing fallen seed germinates, but new seed has yet to be produced (NRA 2007a). The presence of grass species which produce seed early in the wet season (typically early flowering perennials) are likely to be essential for the survival of the black-throated finch (southern).

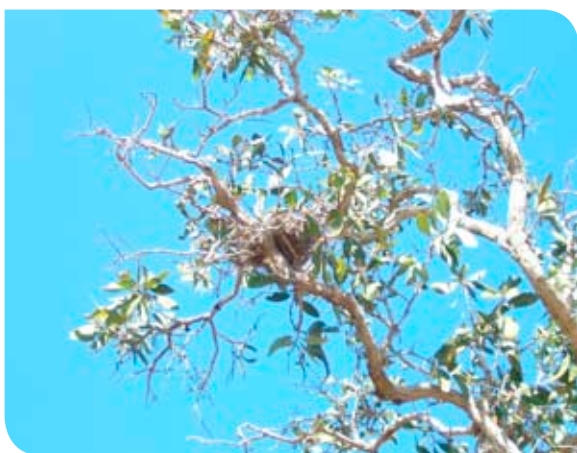
Perennial grasses which are thought to dominate the black-throated finch's (southern) diet include: *Urochloa mosambicensis*, *Enteropogon acicularis*, *Panicum decompositum*, *Panicum effusum*, *Dichanthium sericeum*, *Alloteropsis semialata*, *Eragrostis sororia* and *Themeda triandra* (Mitchell 1996; NRA 2007a). Additional species eaten by the black-throated finch (southern) include: *Schizachyrium spp*, *Echinopogon sp*, *Sorghum spp* and *Paspalum sp* (Mitchell 1996; NRA 2007a). Although there are only a few studies on the diet of the black-throated finch (southern) (Mitchell 1996),

season-dependent diets have been documented in related finch species such as the gouldian finch (*Erythrura gouldiae*), long-tailed finch (*Poephila acuticauda*) and masked finch (*Poephila personata*) (Dostine & Franklin 2002).

Trees

The black-throated finches (southern) nest site selection is more closely related to tree location than to tree structure itself. Individuals are known to nest in a range of structures (that is, pendulous branches, hollow tree limbs, at the base of active raptor nests, bushy shrubs) however, it is the proximity and connectivity of the nesting site to water and foraging resources that is critical. In the Townsville region the subspecies typically nest within 400 m of a water source, and is rarely seen more than one km from permanent water during the breeding season (NRA 2006). Nesting sites also need to be near foraging habitat as observations suggest that during the breeding season the subspecies travels smaller distances than it does during the dry season (Mitchell 1996; NRA 2006; NRA 2007a).

The relatively sedentary lifestyle of the black-throated finch (southern) increases its vulnerability to disturbance, or modification, of any of its three key resources.



Key threats and recovery priorities

The decline in black-throated finch (southern) distribution probably began in the early 20th century with the rise of pastoralism and development of farming in northern New South Wales and Queensland (Franklin 1999; TSSC 2005). Pastoralism was typically concentrated in areas containing suitable habitat for the subspecies, such as grassy, riparian woodlands on alluvial plains (NRA 2007a). The most probable cause of decline from the southern parts of the historic range are overgrazing by sheep and feral rabbits (*Oryctolagus cuniculus*), and habitat clearing (Franklin 1999; TSSC 2005). Declines have been less severe in the northern part of the subspecies range where clearing is not yet as widespread and grazing is predominately by cattle (Garnett & Crowley 2000; BTF RT 2007).

Habitat loss, fragmentation and degradation

Habitat loss, fragmentation and degradation are the main threats to the black-throated finch (southern) (Garnett & Crowley 2000; TSSC 2005; BTF RT 2007). This can occur through clearing for rural subdivision, urbanisation and agriculture and the associated fragmentation of nesting sites, foraging habitat and other grassy woodlands near water sources (Longmore 1978; Garnett & Crowley 2000; NRA 2007a). Domestic stock and rabbits can degrade habitat through grazing, trampling and altering the fuel loads (Franklin 1999; Franklin et al. 2005; Kutt & Woinarski 2007). Changes in the fire regimes can also alter the habitat and food resource availability for the subspecies (Franklin 1999;

Kutt & Woinarski 2007). Invasion of exotic weeds, such as exotic grasses may also degrade the habitat and reduce resource availability (BTF RT 2007); however, the subspecies is known to eat some exotic species (Mitchell 1996).



Grazing

Overgrazing by domestic stock can alter the vegetation cover of the ground, the diversity of grass species, the amount of seed produced and may also encourage the invasion of exotic species (Davies 1977; Reid & Flemming 1992; Franklin et al. 2005; Kutt & Woinarski 2007). Grazing at the beginning of the wet season can reduce the growth of some grass species, such as *Alloteropsis semialata*, which suppresses seed production for the following two years (Crowley & Garnett 2001).

Over-stocking may also degrade the water supply and vegetation surrounding water sources because of erosion, sedimentation and other damage caused by stock crowding (NRA 2007a). Excessive vegetation loss around a water source may make the site inhospitable to the black-throated finch (southern) because it no longer offers retreat sites and security from predators (NRA 2007a).

Fire

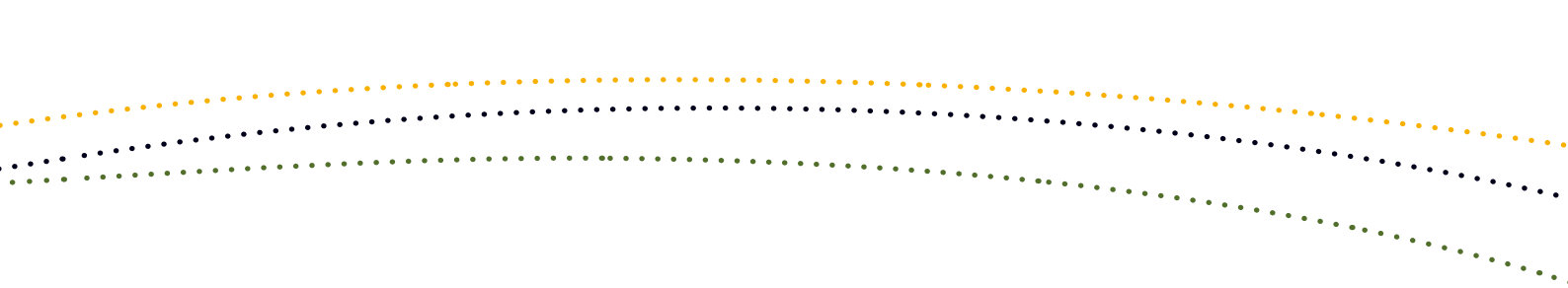
Inappropriate fire regimes appear to severely alter habitat, especially the production of seeds and the diversity of grass species (Kutt & Woinarski 2007). Historically, fire regimes in far north Queensland were natural lightning-strike, low-intensity wet season fires; or under traditional Indigenous management, they were patchy, localised, and started throughout the dry season (Woinarski 1990; Crowley & Garnett 2000; Lewis 2007). Changes in fire regimes impact food availability for the black-throated finch (southern). There is a lack of knowledge surrounding suitable fire regimes in black-throated finch (southern) habitat which is a significant issue.

Resource bottleneck

After rain at the start of the wet season (November to December in northern Queensland), seed availability is limited (Mitchell 1996; NRA 2007a) because the ground stores of seeds from the previous wet season begin to germinate (rendering them inedible), decay or are washed away (Crowley & Garnett 1999). In addition, it is too early in the wet season for new seeds to have been produced (Franklin et al. 2005; BTF RT 2007). This creates a bottleneck of available food resources for the black-throated finch (southern) (NRA 2007a). The intensity of the resource bottleneck tends to depend on the pattern of rainfall and the dry season fire regime.

Drought

The black-throated Finch (southern) has been known to completely vanish from areas it previously occupied when severe droughts are coupled with intense grazing regimes that degrade riparian habitat and compromise water sources (Barnard & Barnard 1924; Woinarski & Catterall 2004). Reports of the subspecies



leaving sites located in New South Wales and southern Queensland during severe droughts in the late 1960s and early 1980s also suggests that the subspecies may not be able to recover from other threats when combined with a lack of suitable water sources (McCutcheon 1976; Passmore 1982).

Additional threats

In addition to habitat loss and degradation, the black-throated finch (southern) recovery team (2007) and Garnett and Crowley (2000) identified the following potential threats:

- illegal trapping of birds for captive trade
- hybridisation with escapees of the northern subspecies, and
- predation by introduced predators.

The combined effects of pastoralism, drought and fire are thought to have had the greatest impact on the subspecies by increasing the period of resource shortage and decreasing the quality and availability of breeding habitat (NRA 2007a). The negative effect of these factors will be more pronounced on juvenile and immature birds during and following the breeding season. Urban and peri-urban development is an emerging and potentially significant threat (NRA 2007a).

Recovery priorities

A national recovery plan (BTF RT 2007) for the black-throated finch (southern) was produced by the black-throated finch (southern) recovery team and adopted under the EPBC Act. The recovery plan aims to manage and protect the subspecies and its habitat, and promote its recovery.

The specific objectives of the recovery plan include the following:

Identify and quantify threats

- investigate breeding requirements and threats to key breeding areas, and
- investigate feeding and other habitat requirements.

Quantify distribution and abundance

- document sightings
- develop standard survey guidelines
- undertake mapping and habitat modelling, and
- undertake targeted surveys.

Protect and enhance habitat

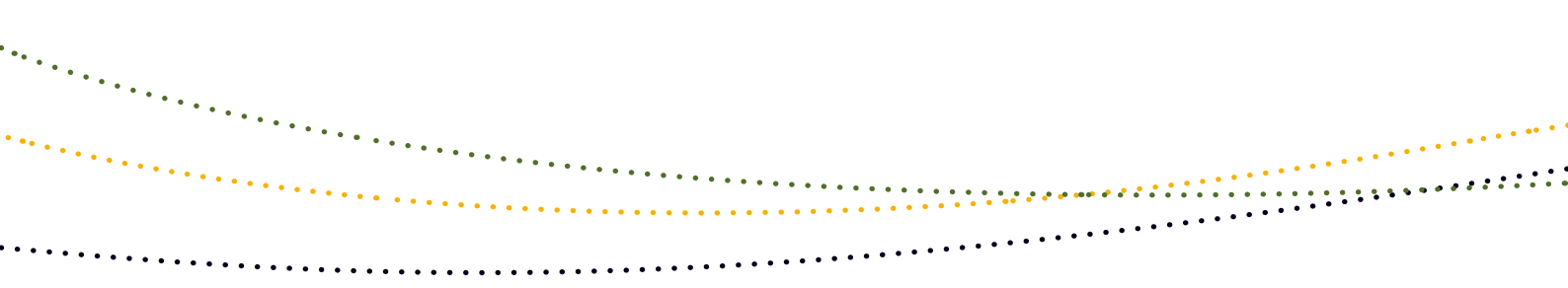
- secure selected sites for conservation
- address threats on grazing lands
- monitor management effectiveness, and
- investigate the development of other statutory planning instruments to minimise impacts of development on the black-throated finch (southern).

Investigate the potential of a re-introduction project

- determine suitability of birds currently in captivity for a reintroduction project.

Increase public awareness

- increase public awareness of the status of and threats to the subspecies.



Significant impact assessment

Whether or not an action is likely to have a significant impact depends on the sensitivity, value and quality of the environment which is impacted and the intensity, duration, magnitude and geographic extent of the impacts. The potential for an action to have a significant impact will therefore vary from case to case. The following thresholds have been developed to provide guidance in determining the likely significance of impacts on the black-throated finch (southern).

Distribution maps

Figures 1 and 2 highlight important areas for the black-throated finch (southern) in Queensland and the greater Townsville region.

The important areas for black-throated finch (southern) are defined as the habitat within five km of post-1995 sightings of the black-throated finch (southern). These areas are likely to contain the critical habitat configuration between water sources, grasslands and nesting trees.

The maps provided in Figures 1 and 2 are based on the information available at publication and are intended as a guide; they should not be taken to be definitive or exhaustive. Outside the areas identified in Figures 1 and 2, caution should be taken to minimise impacts on habitat quality within five km of **any** black-throated finch (southern) sighting.

Significant impact thresholds

It is thought that the black-throated finch (southern) continues to persist in the Townsville hinterland because the historic land use has preserved the mosaic of grassland and woodland critical to the survival of the subspecies. The main land use in the area surrounding Townsville is low intensity agriculture (mainly beef production), however there is increasing pressure for low density residential development.

Within the area shown in Figure 2 (essentially areas within five km of known sightings) uses and developments that markedly degrade the landscape value may have a significant impact on the black-throated finch (southern). Alternatively, activities that are designed to preserve the character and quality of the area may not have a significant impact.

As a guide, the character and quality of the habitat may be significantly diminished if an action results in:

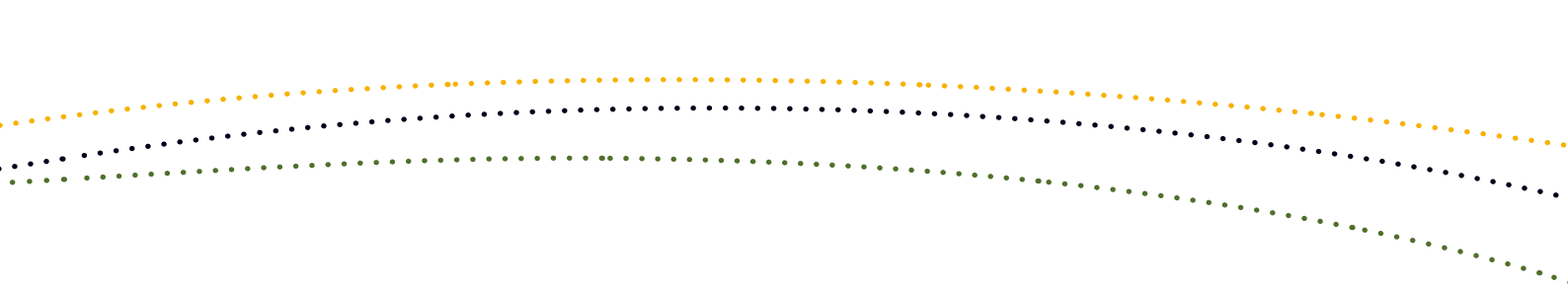
Net loss or degradation of water sources (either permanent or seasonal) in the locality

- Maintaining a variety of water sources (both permanent and seasonal) in the landscape is critical to providing suitable habitat for the black-throated finch (southern). Permanent removal of a water source resulting in a net loss of available water from the local landscape may have a significant impact on the black-throated finch (southern).

Widespread or indiscriminate loss of trees, including known nesting trees within one km of a water source

- Maintaining trees within one km of a water source is critical to providing suitable nesting





and roosting habitat for the black-throated finch (southern) and any net loss of trees within one km of a water source may have a significant impact on the black-throated finch (southern). Any essential tree removal should aim to be selective and not broad scale.

A decrease in tree recruitment capacity which limits the area's ability to be self-sustaining

- An area's ability to be self-sustaining is critical to its long term ability to support the black-throated finch (southern). Maintaining a mix of age classes among tree species is vital and actions that will potentially result in the loss of one or more age classes (for example wide scale clearing of undergrowth and seedlings) may have a significant impact on the black-throated finch (southern).

The degradation of foraging habitat (grassland) where known black-throated finch (southern) records exist, including the intensification of biomass reduction or stocking rates

- Maintaining a mosaic of seeding grass species in the landscape is critical to providing suitable habitat for the black-throated finch (southern). An action that decreases the quantity, variety and availability of seed for the black-throated finch (southern) may have a significant impact on the subspecies because it reduces or eliminates a food source. Biomass management regimes require careful consideration and grazing and stocking rates should be conservative to ensure the retention of a variety of seeding grasses.

Note that the presence of the black-throated finch (southern) at a site indicates that the existing management regime is likely to be compatible with maintaining suitable habitat for the subspecies.

The thresholds outlined above were developed in consultation with experts to provide guidance in determining the likely significance of impacts

on the black-throated finch (southern). However, decisions on significance will **always** need to be made on a case by case basis with consideration for the context of the action.

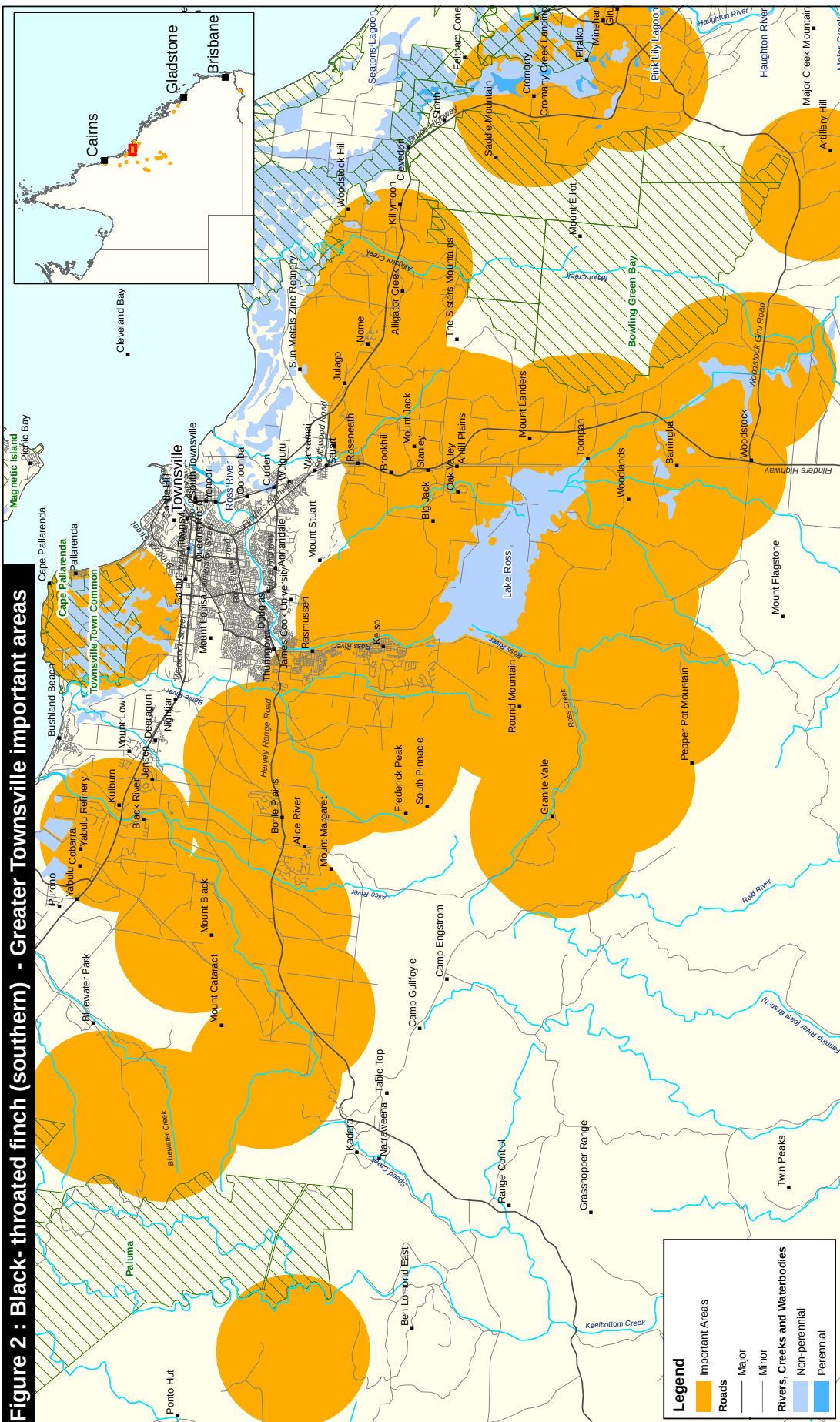
Actions likely to have a significant impact

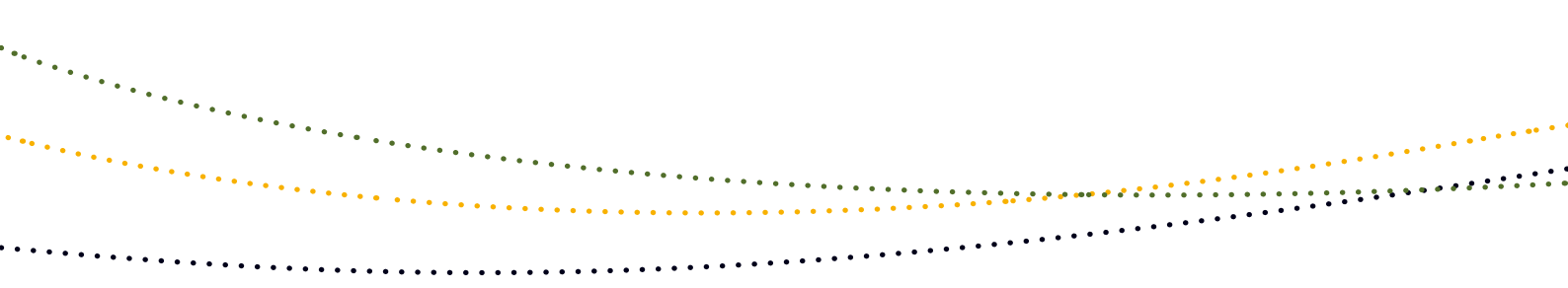
These examples should be read in conjunction with the significant impact criteria in this policy statement and the 'EPBC Act policy statement 1.1, Significant impact guidelines – matters of national environmental significance', and should not be taken to be exhaustive or conclusive.

Actions that may lead to the loss, degradation and/or fragmentation of black-throated finch (southern) habitat and may have a significant impact on the subspecies, could include, but are not limited to:

- clearing of grassland and/or grassy woodland
- damming or disrupting the natural flows of creeks and rivers
- earthworks or excavation
- pasture improvement
- changes in biomass management regimes, for example burning, slashing or changes in intensity of grazing regimes, especially during the resource bottleneck period (November to December)
- construction of roads, structures and/or hard surfaces
- construction of temporary or permanent structures for storage and accommodation
- the introduction of domestic and agricultural animals
- the introduction of exotic plants, particularly exotic grasses, and
- substantial increases in human traffic and/or recreational activities (for example trail bike riding, dog walking etc.).

Figure 2 : Black-throated finch (southern) - Greater Townsville important areas





Mitigation measures

Mitigation activities are generally undertaken on the site of the development to avoid or reduce impacts. Ideally, mitigation measures should be incorporated into the design of a development so that significant impacts do not occur.

Care should be taken to ensure that any mitigation and/or management actions implemented for the black-throated finch (southern) do not have a negative impact on other matters of national environmental significance present at a site. The mitigation and management proposed at a site needs to take into account the needs of all matters of national environmental significance in a project area.

The following measures may assist in minimising impacts on the black-throated finch (southern). They should be used with the aim of reducing the impact of an action to below the thresholds laid out in this document. Avoidance measures should be considered the priority, followed by measures to reduce the level of impact. In many cases, a combination of mitigation measures may give the highest benefit.

Avoiding impacts

Retain suitable habitat for the black-throated finch (southern) by:

- designing actions to avoid loss of habitat for the black-throated finch (southern)
- designing actions to maximise on-site retention of habitat through the creation of reserves/development of conservation agreements
- limiting access (by people and domestic animals) to black-throated finch (southern) habitat to minimise degradation, and

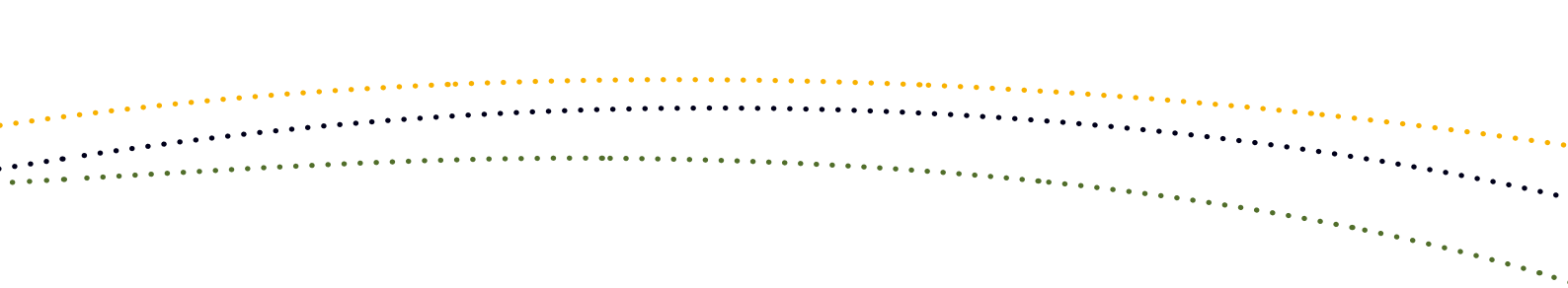
- implementing a management plan for the protection of black-throated finch (southern) habitat.

Minimising impacts

Ensure impact on subspecies habitat is minimised by:

- retaining remnant woodland within one km of water sources (nesting habitat)
- maintaining all foraging habitat within 400 m of known nesting habitat, and within three km of permanent water sources
- maintaining connectivity between important habitat, or areas known or likely to contain the black-throated finch (southern), with corridors of at least 100 m in width. (**Note:** when planning corridors and buffers, priority should be given to riparian areas and alluvial plains, where early flowering perennial grasses are likely to occur. Land uses adjoining corridors should be planned and conditioned so as to not impact the ecological integrity of the corridor. Also, the effectiveness of habitat corridors diminishes with increasing length)
- building structures (for example buildings, roads etc) at least one km from water sources and nesting trees
- enhancing the availability of water in the landscape through management and construction of water sources. Changing the location/configuration of a water source is one of the only options available when maintaining the status quo is not possible (NRA 2007a). Any creation of water sources relies on suitable habitat being available not only throughout the landscape, but specifically in the area where the water source is to be





located (further information on water source management options can be found in the subspecies' SPRAT profile), and

- enhancing the availability of seeding grasses in the landscape. Limit livestock grazing to ensure that the herbaceous layer (particularly perennial grasses) is maintained in a healthy condition; care should be taken to plan a grazing regime that will achieve this.

Managing habitat

Appropriate biomass management regimes should be adopted for grassland areas. If black-throated finches (southern) are already using the area, maintain existing regime.

The black-throated finch (southern) is thought to be most vulnerable to decline during its two most resource-dependant periods (when resources are naturally low and when the demands for resources are high). These periods correspond with the start of the wet season (during the resource bottleneck) and during the breeding season (NRA 2007a).

It is thought that in the Townsville region, cool burns between June and September, no more than one every three years, are most suitable for the black-throated finch (southern).

There is a recognised conflict between the need to manage fire risk on properties and the need to maintain black-throated finch (southern) foraging habitat. All biomass management techniques (for example mowing, slashing etc) should be limited to the immediate area surrounding a building's footprint.

Grazing

Grazing and stocking rates should be conservative to ensure retention of black-throated finch habitat. In determining the short term carrying capacity of an area, thorough

assessment of ground cover and land condition is required. The short term carrying capacity of an area needs to be assessed and recalculated seasonally, and animal numbers need to be adjusted accordingly. When developing a grazing management plan proponents should consult with their local grazing land management official.

Wet season spelling

Wet season spelling, or rest, (that is, the removal of grazing stock) in northern Queensland, provides a period of protection from grazing that allows grass species to replenish essential plant reserves, set seed and allow seedling recruitment. It should be incorporated into any grazing regime in black-throated finch (southern) habitat. Pastures need to be spelled during the wet season when they are actively growing (CSIRO 2008). Wet season spelling should be applied to grazing country that provides habitat for the black-throated finch (southern). Wet season spelling allows perennial grasses – which use up their stored root reserves to send up shoots when the season breaks – to replenish their reserves rather than being further depleted as grazing animals nip off the new shoots. Wet season spelling therefore strengthens perennial grass plants and increases the overall production of biomass.

Other measures

There are three more key measures to carry out to maintain subspecies habitat:

- avoid all biomass reduction (for example mowing, slashing, fire etc.) during the early wet season resource bottleneck
- manage invasive plant species such as Chinese Apple (*Ziziphus mauritiana*) and ensure native tree species are established prior to the removal of Chinese Apple, and
- control feral animals (for example cats and rabbits).

Survey guidelines

A guide to conducting surveys, taken from NRA 2007b, for the black-throated finch (southern) is given below. These survey guidelines are based on experience surveying for black-throated finches (southern) in north Queensland. Surveys should be designed to maximise the chance of detecting the subspecies, and should also be used to determine the context of the site within the broader landscape. Consideration should be given to the timing, effort, methods and area to be covered in the context of the proposed action.

Description and similar species

The black-throated finch (southern) could be confused with the black-throated finch (northern), but can be distinguished by the white upper-tail coverts (upper-tail coverts are black in the northern subspecies) and the richer brown colouring to the plumage of the body (Keast 1958; Schodde & Mason 1999; BTF RT 2004; Magrath et al. 2004; Higgins et al. 2006).

The black-throated finch (southern) is similar in appearance to the long-tailed finch (*Poephila acuticauda*), and somewhat similar to the masked finch (*P. personata*) (Higgins et al. 2006), but confusion between the black-throated finch (southern) and these species is unlikely as the long-tailed finch and, for the most part, the masked finch, are absent from the normal range of the subspecies (Schodde & Mason 1999).

The black-throated finch (southern) may be also confused with the chestnut-breasted mannikin (*Lonchura castaneothorax*) which is common along the north east coast of Australia. Black-throated finches (southern) are distinguished by their grey head and face, brown

underbelly, prominent black bib and white rump, whilst the chestnut-breasted mannikin has a black face, orange rump, chestnut breast with a dark brown band separating a white underbelly.

Nests

Black-throated finches (southern) build bottle-shaped nests of woven grass. Structurally the nests are very similar in appearance to other finch species (for example double-barred finch (*Taeniopygia bichenovii*), chestnut-breasted mannikin and zebra finch (*Taeniopygia guttata*)) and are often difficult to differentiate, even for the experienced observer. Although there is variation in nest size and structure,



black-throated finch (southern) nests in the Townsville region are frequently slightly larger and have a longer entrance platform than the other co-occurring species (that is, double-barred finch, chestnut-breasted mannikin and zebra finch). Black-throated finch (southern) nests in this region are also thought to be positioned higher than other co-occurring species. Nests may be built in the outer branches of trees and tall shrubs, in tree-hollows, in mistletoes, and in the base of raptor nests. Black-throated finches (southern) also tend to form loose communal nesting sites, with multiple nests usually occurring in a small area; for example a single tree may contain several active nests (two to five nests have been observed in one tree). This behaviour may assist in identifying some potential black-throated finch (southern) nesting sites. Nests are used for breeding and roosting, with individuals returning each night to roost. The most reliable way to determine what species is using the nest is to watch a potential nest throughout the day, especially just before dark.

Presence-absence surveys

The recommended survey protocol depends on the location and types of water resources present within and adjacent to the subject land. The following conditions should be considered.

Type of water source within and immediately adjacent to subject land	Survey timing
Seasonal and permanent	Wet and dry season surveys
Seasonal only	Wet season surveys
Permanent only	Wet and dry season surveys

Immediately adjacent is defined as less than one and a half kilometres. Seasonal water sources are defined as those that have available water for greater than three months of the year. Seasonal water sources for black-throated

finches (southern) may comprise man-made impoundments, water tanks or troughs, wetlands, creeks and shaded rock bars.

Water source watching is the recommended technique for dry season surveys. Observations should occur for at least three hours after first light, with subsamples from the rest of the day (for example one hour during mid-day, one hour mid-afternoon and one hour late afternoon). It is preferable that each water source is surveyed on two separate days according to this regime. All water sources should be observed, especially those separated by more than 500 m. The observer should be positioned in a manner that allows uninterrupted views of the water source whilst not disturbing the wildlife. The end of the dry season is the preferable timing for these surveys.

Wet season surveys should involve water source watching and targeted searches in woodland and grasslands surrounding the water source. The preferred timing for wet season surveys is the period when ground stored grass seed is at its greatest abundance. This period will vary annually and geographically according to climate and weather patterns. As a rough guide surveys are recommended between November and February in areas south of latitude 23° and March to May north of 23°. The protocol for water source watching should follow that described for the dry season survey. Targeted searches should involve walk-through surveys within a 600 m radius of all water sources, with specific effort devoted to grassland areas, especially those with a woodland/shrubland over-storey. Surveys should include searches for visible signs of black-throated finches and their nests and detection from calls. Survey effort is described below. The effectiveness of this technique will be commensurate with the level of experience of the surveyor.

Survey protocols may need to be modified when water resources are inaccessible and/or located outside the subject land. Water hole surveys may not be possible in this situation and will usually warrant an increased targeted search effort within the subject land. Targeted wet season searches should occur within any sections of the subject land within 600 m of seasonal and/or permanent water sources (as described above). Targeted searches within this area should be repeated in the dry season if the water source is permanent. Additional dry season searches are recommended within any sections of the subject land that fall within one and a half kilometres of permanent water. Searches should focus on all areas of suitable dry season foraging habitat. Survey effort is described below.

Although black-throated finches (southern) do not appear to be closely associated with any species, observers should also examine flocks of other species of finches, small seed-eating doves (peaceful doves, diamond doves) and black-faced woodswallows (*Artamus cinereus*) when conducting targeted searches.

Type of information to record

In addition to the standard information collected during fauna surveys (for example date, time, weather and location of observation), observers should try to record the following when black-throated finches (southern) are encountered.

- **number** of birds in a group – maximum group size is often the most reliable indicator of population size for short term observation surveys.
- **age** structure of observed group – juveniles tend to be slightly smaller and duller in colour than adults (especially the legs and black trouser stripe). Juveniles can also be differentiated based on behaviour (for example begging for food from parents) and call (juvenile call tends sound more crackly and strained than adult).
- **behaviour** – the types of behaviours that may be encountered include feeding, drinking, perching, preening, parents feeding begging young, fighting, nest building and mating.

Guide to survey effort

Technique	Field Effort	
	Water source located within subject land	Water source is inaccessible (for example outside subject land)
Targeted searches	one hour/ha with maximum of 10 hours per search area (that is 600 m radius of water source)	one hour/ha with maximum of 10 hours within 600 m radius of water source. one hour/ha with maximum of 20 hours within one and a half kilometre radius of water source
Water source observations	Minimum of six hours a day for two days for each water source (that is, 12 hours/water source)	Not applicable



- **habitat** – details of habitat being used including the dominant species in overstorey and understorey.
- **nests** – information including height and host structure (for example outer branches, hollow, etc) and type, (that is breeding and/or roosting) based on behavioural observations.

Impact assessment studies

Follow up surveys may be required in circumstances where presence-absence surveys have not collected sufficient information. What constitutes sufficient information will vary according to the specific situation. However generally speaking, data on the location of key habitat components during the wet and dry season is the recommended baseline. Key habitat components include the location of breeding and/or nesting sites, key water sources and key foraging sites (especially during the breeding season). The effort required to achieve this will vary according to the particular circumstance. More detailed studies typically involve following pairs, family groups or groups of black-throated finches (southern) throughout the day in order to gain a better understanding of the population and how it is using the subject area. This may in some circumstances require sampling across different months of the year and several days of observation during each event.

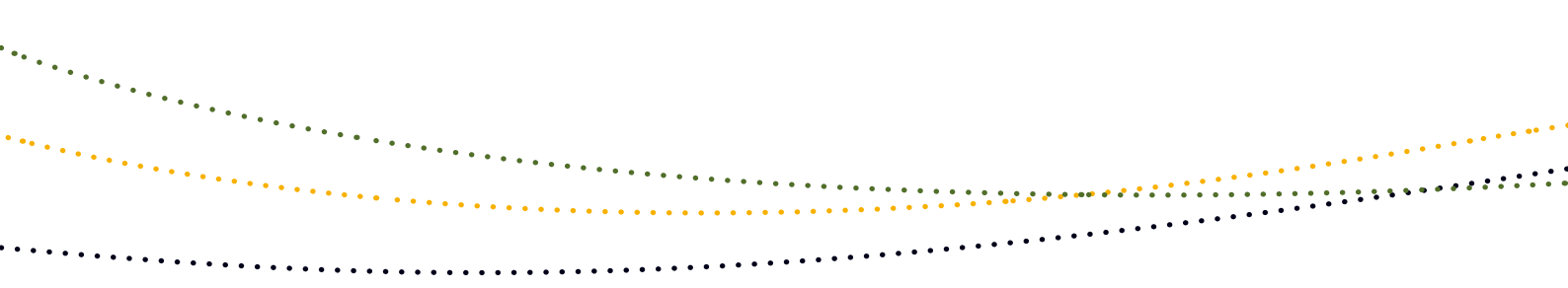
Habitat assessment

Habitat assessment surveys should be used to determine the context of the site within the broader landscape. Surveys should assess the characteristics of the site, including:

- current land use and site history (for example grazing, cropping)
- grassland quality and composition (that is, rough proportions of exotic, native, perennial and annual species)
- grass density (amount of bare ground)
- number of water sources within five km, and the water retention dynamics (permanent vs. seasonal)
- types of available water sources on site (natural vs. artificial) and the distance from nesting trees and foraging habitat (which may be offsite)
- number, location and characteristics of known nesting trees (nest height, tree species, tree structure etc.)
- number, location and characteristics of potential nesting trees (tree species, tree structure), and
- connectivity of the site to other areas of black-throated finch (southern) habitat.

Where surveys cannot be conducted outside of the site, other aids such as aerial photographs, historical records, and vegetation data sets can be useful in giving context to the site.

Suitable maps should be provided indicating the location of all seasonal and permanent water sources, all potential foraging areas indicating the likely value of these foraging areas (within the context of their proximity to different water sources and nesting habitat), and all potential and known nesting habitat.



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PHOTO CREDITS

FRONT COVER IMAGES (left to right)

Landscape (K Lynch), Black Throated Finch (R & A Sutton), Landscape (K Lynch), Black Throated Finch (R & A Sutton), Black Throated Finch (G Baker), Landscape (K Lynch)

INTERNAL IMAGES (left to right, top to bottom)

p2 Black Throated Finch (R & A Sutton), p3 Black Throated Finch (R & A Sutton), p5 Black Throated Finch (G Baker), p6 Landscape (K Lynch), p7 Birdnest (K Lynch), p8 Landscape (K Lynch), p16 Birdnest (K Lynch)

BACK COVER IMAGES (left to right, top to bottom)

Landscape (K Lynch), Black Throated Finch (R & A Sutton), Birdnest (K Lynch), Black Throated Finch (R & A Sutton)

