Hoplogonus simsoni

Simsons Stag Beetle

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Image © C. Spencer, K. Richards

Common name: Simsons Stag Beetle

Scientific name: ***Hoplogonus simsoni*** Parry, 1875

Group: Invertebrate, Class Hexapoda, Order Coleoptera, Family Lucanidae

Status: *Threatened Species Protection Act 1995*: **vulnerable**
Environment Protection and Biodiversity Conservation Act 1999: **Vulnerable**
IUCN Red List: **Not listed**

Distribution: Endemic status: **Endemic to Tasmania**
Tasmanian NRM Regions: **North**

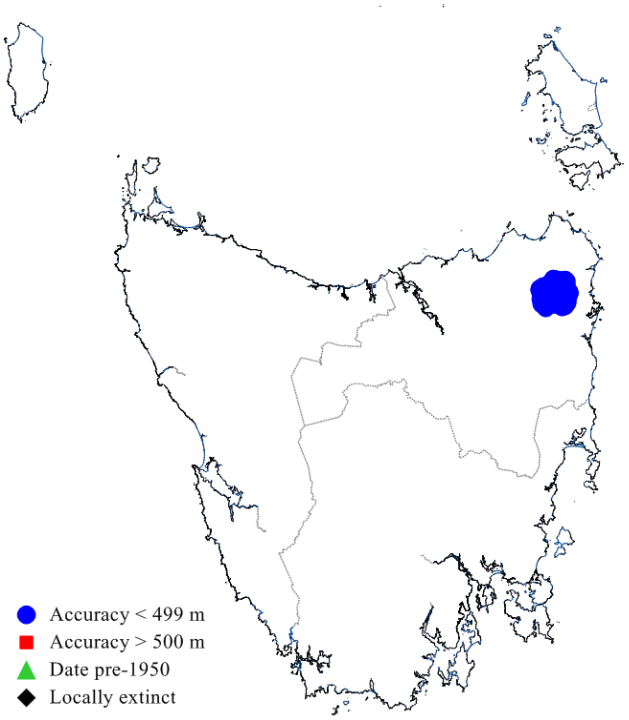

Figure 1. The distribution of Simsons Stag Beetle, showing NRM regions

Plate 1. Simsons Stag Beetle (male) (image © C. Spencer, K. Richards)

SUMMARY

Simsons Stag Beetle (*Hoplogonus simsoni*) is a flightless, dark-coloured, ground-dwelling beetle growing to 32 mm in total length, and is the largest endemic stag beetle found in Tasmania. The male has large, distinctive mandibles (jaws). The species is limited to an area of 264 km^2 of native forest in north-eastern Tasmania centred on the Blue Tier.

Simsons Stag Beetle lives on the floor of mature wet eucalypt forest, damp forest, rainforest and mixed forest amongst the leaf litter. A deep layer of accumulated leaf litter is important to the survival of this species.

The primary threat to Simsons stag beetle is any activity resulting in exposure and drying of the soil and leaf litter. This includes activities that open up the forest canopy or disturb the forest floor, such as cutting or clearing live or dead vegetation, or burning.

Greater protection of habitat from such activities, and an improved, wider understanding of how to limit their impacts on the species, would address the key objective of maintaining and improving habitat throughout the species' range.

IDENTIFICATION AND ECOLOGY

Simsons Stag Beetle (*Hoplogonus simsoni*) belongs to a group of flightless, black, ground-dwelling beetles, with distinctive spines on the elytra (hardened forewings that form a protective cover for the abdomen) and large mandibles (jaws) in males.

There are three described species of *Hoplogonus*. The genus is distinguished from all other genera of stag beetles by having two obvious pairs of humeral spines (Bartolozzi 1996b, FPB 2002). One pair of spines is located at the lower edge of the thorax directly above the second, larger pair, which are located on each corner of the abdomen. Simsons Stag Beetle is range in total body length from 13-32 mm (males) and 13.3-20.7 mm (females) (C. Spencer unpubl. data). While males and females are superficially similar with respect to most body parts, the mandibles are much longer and straighter in males, and the body of the female is broader and shorter (Parry 1875).

Simsons Stag Beetle is a long-lived beetle with a larval stage lasting up to two years and an adult lifespan in the range of one to two years, perhaps three years (Meggs 1997, Meggs et al. 2003, Fox et al. 2004). Females lay between 10 and 20 eggs seasonally (P. McQuillan pers. comm., cited in Fox et al. (2004)). Mortality is likely to be highest in the larval stage with larvae being attractive food for a range of below and above-ground fauna. Adults emerge between spring and summer, after remaining in the soil over winter. Many males are seen in the early part of summer and it is assumed that they do most of their mate searching during this time. Female Simsons Stag Beetles are more prevalent in late summer amongst the leaf litter on the forest floor.

Survey techniques

There are two survey methods for adult stag beetles (FPB 2002). One is a search to establish whether the species is present at a site (timed search) and is recommended for threatened stag beetles including *Lissotes latidens*, *Hoplogonus simsoni*, *H. bornemisszai* and *H. vanderschoori*; the other is a more systematic area search method that can be used to obtain density estimates for *H. simsoni* and *H. bornemisszai*. More recently, a revised survey method has been developed involving digging 'larval pits', which has been found to be an efficient means of detecting the species due to the proportionally higher numbers of larvae present resulting in shorter survey times. This method may assist in determining species presence in areas of low population density (C. Spencer & K. Richards, pers. comm.).

Confusing species

The species is distinguished from the other two *Hoplogonus* species by the shape of the male mandibles. For a detailed taxonomic description of Simsons Stag Beetle see Parry (1875) and Bartolozzi (1996a,b).

DISTRIBUTION AND HABITAT

Simsons Stag Beetle is endemic to Tasmania. The species is limited to an area of native forest in north-eastern Tasmania, centred on the Blue Tier (Table 1, Figure 1).

Simsons Stag Beetle shows a preference for wet eucalypt forests and its abundance is influenced by altitude, slope, leaf litter depth and forest structure (Meggs et al. 2004). Leaf litter depth has been identified as an important habitat characteristic for Simsons Stag Beetle. Decomposing leaf litter provides organic material to the soil and food for larvae, and provides a moist microclimate for both larvae and adults and provides refuge from predators.

The species has been well surveyed (Meggs 1996, Meggs 1997, Meggs 1998, Richards 1999, Meggs et al. 2003, Meggs et al. 2004, Munks et al. 2004). In addition to these more formal surveys, anecdotal collections have contributed records, including the type locality. It is unlikely that the range of Simsons Stag Beetle will be extended more than a few kilometres as much of its current known range is surrounded by unsuitable habitat (e.g. dry eucalypt forest).

POPULATION PARAMETERS

There are no precise estimates of the abundance of Simsons Stag Beetle. In one study, Meggs et al. (2003) reported that the species was found to occur at very high densities (>5/m^2) or high densities (3-5/m^2) at several locations, but over most of its range it occurred at lower densities (<1/m^2).

The species is present throughout much of its known range (although it is largely absent from the native forest at higher altitude centred on the Blue Tier) and is not evenly distributed throughout this range (Meggs et al. 2003). For convenience, Table 1 lists some broad 'locations' for the species. In the absence of information about the species' distribution between these points, it is inappropriate to consider that the species occurs as discrete subpopulations.

The estimated extent of occurrence is 264 km^2, and the estimated linear extent is 19 km. The estimate of the area of occupancy is 219 km^2, provided by Meggs et al. (2003), where the area of potential habitat is used as a surrogate for area of occupancy. Potential habitat for Simsons Stag Beetle (or the predicted area of occupancy) may be broadly defined as all relatively undisturbed wet forest types (including mixed/rainforest) within the species range.

RESERVATION STATUS

Approximately 40% of potential habitat of the Simsons Stag Beetle is in State forest, 12% on private land and 40% in some form of reserve (DPIW & FT 2008), including informal reserves, such as areas managed by prescription on State forest including wildlife habitat strips under the *Forest Practices Code* (FPB 2000) and Forestry Tasmania's Management Decision Classification mapping system (Orr & Gerrand 1998).

Simsons Stag Beetle occurs in the Frome Forest Reserve, Blue Tier Forest Reserve, Mt Victoria Forest Reserve and Public Reserves at the George River and Weldborough Scenery Reserve. Potential habitat occurs on several parcels of Crown land, some of which (totalling c. 130-150 ha) have been recommended as Nature Conservation Areas or Public Reserves under the Tasmanian *Nature Conservation Act 2002* (CLAC 2006).

CONSERVATION STATUS

Simsons Stag Beetle is listed as vulnerable on the Tasmanian *Threatened Species Protection Act 1995*, meeting criterion B (extent of occurrence estimated to be less than 20,000 km^2), specifically B2c (continuing decline in area, extent and/or quality of habitat).

THREATS, LIMITING FACTORS AND MANAGEMENT ISSUES

TSS (2012) identified the following major threats to Simsons Stag Beetle: loss of habitat, particularly due to clearing for agriculture or establishment of forestry plantations, removal of coarse woody debris by harvesting for firewood and high intensity burns.

The primary threat to Simsons Stag Beetle is any activity that opens the forest canopy or disturbs the soil and litter layer leading to exposure to sunlight and dehydration, which may in turn lead to greater predation by species such as currawongs, quolls, Antechinus and native and exotic rodents.

Table 1. Population summary for Simsons Stag Beetle

	Location	Tenure	NRM region*	1:25 000 mapsheet	Year last (first) seen	Extent of subpopulation (ha)	Number of records
1	Weldborough area (west of Tasman Highway)	State forest	North	Derby	1997	Unknown	14 records
2	Weld River area	Frome Forest Reserve	North	Derby	2007 (1997)	Unknown	3 records
3	Frome Dam area	Frome Forest Reserve	North	Derby	1996	Unknown	1 record
4	Three Notch Track area	State forest	North	Spurrs Rivulet	1997 (1996)	Unknown	4 records
5	Headwaters of Old Chum Creek	State forest	North	Spurrs Rivulet	2007 (1998)	Unknown	4 records
6	Bendover Hill	Private property	North	Victoria	1997	Unknown	1 record
7	Le Fevre Creek/upper North George River	Private property	North	Ringarooma	2005 (2004)	Unknown	4 records
8	Marguerita Ridge/Lottah area	State forest	North	Blue Tier	2008 (1999)	Unknown	11 records
9	Kunnarra Creek	State forest	North	Blue Tier	1999 (1997)	Unknown	4 records
10	Murdochs Road (Swan Rivulet)	State forest	North	Blue Tier	1998 (1972)	Unknown	20 records
11	Great Musselroe River	State forest	North	Spurrs Rivulet	1997 (1996)	Unknown	5 records
12	New England Road	State forest	North	Spurrs Rivulet	2007 (1996)	Unknown	39 records
13	Murdochs Road north/Platts Lookout	State forest	North	Blue Tier	2005 (1996)	Unknown	36 records
14	Poimena	Blue Tier Forest Reserve	North	Blue Tier	1996	Unknown	2 records
15	Weldborough Pass	Public Reserve	North	Ringarooma	1997	Unknown	2 records
16	Rattler Hill	State forest	North	Ringarooma	1997 (1996)	Unknown	3 records
17	Tasman Highway (south of Little Plain)	Private property	North	Blue Tier	2007	Unknown	1 record
18	Rattler Range	Mt Victoria Forest Reserve	North	Ringarooma	1997	Unknown	2 records
19	Organs Hill area	State forest	North	Blue Tier	1998 (1997)	Unknown	4 records

	Location	Tenure	NRM region*	1:25 000 mapsheet	Year last (first) seen	Extent of subpopulation (ha)	Number of records
20	Linda Vale Road	Mt Victoria Forest Reserve/ Public Reserve	North	Ringarooma	2003	Unknown	2 records
21	Mothers Hill area (George River)	State forest	North	Blue Tier	2006 (2002)	Unknown	5 records
22	Lehners Ridge	State forest	North	Blue Tier	2000	Unknown	3 records
23	Lottah Road W	State forest	North	Blue Tier	2000	Unknown	1 record
24	Tasman Highway (Anchor Road) to Goughs Hill	State forest Private property	North	Blue Tier	2005 (1972)	Unknown	25 records

*NRM region = Natural Resource Management region

Habitat loss (clearing for pasture/crops or plantations): Conversion of potential habitat to plantation or clearing for agriculture within the range of the species results in permanent loss of habitat. Fox et al. (2004) modelled various management scenarios depicting increasing levels of plantation conversion, which resulted in projected population declines after 100 years, ranging from 8 to 38%. It should be noted that conversion of native forest to plantation on State forest has now ceased, although it is still allowed on private property. Approximately 5% of potential habitat of the species has been converted since 1996, although what proportion of the actual population this represents is unknown.

Habitat modification (native forest silviculture): Forestry activities pose the greatest threat to Simsons Stag Beetle given that much of its habitat on both public and private has been identified as having potential for wood production. There is a Public Authority Management Agreement (PAMA) established in July 2008 under the Tasmanian *Threatened Species Protection Act 1995* (FT & DPIW 2008). The PAMA sets limits on coupe dispersal and rotation lengths including a limit on the extent of native forest harvesting within the next ten years to less than 25% of potential habitat for Simsons Stag Beetle on State forest, whereby no more than 10% of potential habitat would be clearfelled in the next ten years.

Habitat modification (removal of coarse woody debris): Firewood collection occurs on all tenures (excluding reserves) and may locally affect potential habitat (especially through drier parts of the species' range). High intensity burns have the potential to remove coarse woody debris but such burns are usually undertaken as part of forestry operations so are considered in the next section. The potential impact of activities such as fuelwood harvesting (i.e. woody debris collected for energy production) on the species is unknown, but are considered likely to impact on habitat quality.

Burning: The burning of forest habitat has the effect of removing accumulated litter and coarse woody debris, which can take many years to re-establish. While fire is a natural component of Tasmania's eucalypt forests, too frequent burning of wet forest can lead to long-term damage and removal of the leaf litter layer and other coarse woody debris, leading to the degradation or destruction of Simsons Stag Beetle habitat.

Stock trampling: Uncontrolled access by stock to areas of forest habitat can lead to significant degradation of the leaf litter habitat for Simsons stag beetle through compaction of the leaf litter and soil.

Climate change: The trend towards a warmer climate may increase the frequency of and exacerbate the effect of wildfire on the habitat of Simsons Stag Beetle. A warmer climate (and less rainfall) may also alter the suitability of wet

and damp forest, causing a shift to drier habitat conditions less suitable for the species.

MANAGEMENT STRATEGY

What has been done?

Recovery planning: A draft recovery plan (TSS 2012) has been prepared for Tasmanian threatened stag beetles, including Simsons Stag Beetle.

Targeted surveys & monitoring: There have been numerous surveys for Simsons Stag Beetle including those reported by Meggs (1996), Meggs (1997), Meggs (1998), Richards (1999), Meggs et al. (2003), Meggs et al. (2004) and Munks et al. (2004). Anecdotal collections have contributed records and there have been numerous surveys of proposed forestry coupes on both private property and State forest throughout the potential range of the species. The Forest Practices Authority has been undertaking long-term monitoring of the impacts of different forest management practices on threatened stag beetles in northeastern Tasmania.

Forestry management: a Public Authority Management Agreement (PAMA) controls forest management activities on State forest. Simsons Stag Beetle is included in the *Threatened Fauna Adviser*, a decision-support system used by the forest industry to take account of threatened fauna in wood production forests (FPB 2000, 2002). Consultation between the Forest Practices Authority and DPIPWE is required under the protocols for managing threatened species in wood production forests (FPB 2000).

Management objectives

The main objective for the management of Simsons Stag Beetle is to maintain and improve habitat throughout the range of the species through appropriate land management.

What is needed?

- To minimise the loss or degradation of subpopulations – improve reservation status and/or develop management agreements with private landowners and implement the existing Public Authority Management Agreement between DPIPWE and Forestry Tasmania;
- To better understand the impacts of forestry activities on the species – analyse and report the results of a long-term study looking at the impacts of these forestry practices on the threatened stag beetles;
- To better protect the species – provide information and extension support to fire management authorities such that the species can be appropriately considered in fire management plans within its range;
- To better protect the species – provide information and extension support to relevant Natural Resource Management committees, local councils, government agencies, the local community and development proponents on the locality, significance and management of known subpopulations and potential habitat of Simsons Stag Beetle.

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Cite as: Threatened Species Section (2012). *Listing Statement for* Hoplogonus simsoni *(Simsons Stag Beetle).* Department of Primary Industries, Parks, Water and Environment, Tasmania.

View:
http://www.dpiw.tas.gov.au/threatenedspecieslists

Contact details: Threatened Species Section, Department of Primary Industries, Parks, Water and Environment, GPO Box 44, Hobart, Tasmania, Australia, 7001. Phone (03) 6233 6556; fax (03) 6233 3477.

Permit: A permit is required under the Tasmanian *Threatened Species Protection Act 1995* to knowingly "take" (which includes kill, injure, catch, damage, destroy and collect), keep, trade in or process any specimen of a listed species.