Hoplogonus bornemisszai

Bornemisszas Stag Beetle

TASMANIAN THREATENED SPECIES LISTING STATEMENT

Image © C. Spencer, K. Richards

Common name: Bornemisszas Stag Beetle

Scientific name: ***Hoplogonus bornemisszai*** Bartolozzi, 1996

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

Status: *Threatened Species Protection Act 1995*: **endangered**

Environment Protection and Biodiversity Conservation Act 1999: **Critically Endangered**

IUCN Red List: **Not listed**

Distribution: Endemic status: **Endemic to Tasmania**

Tasmanian NRM Regions: **North**

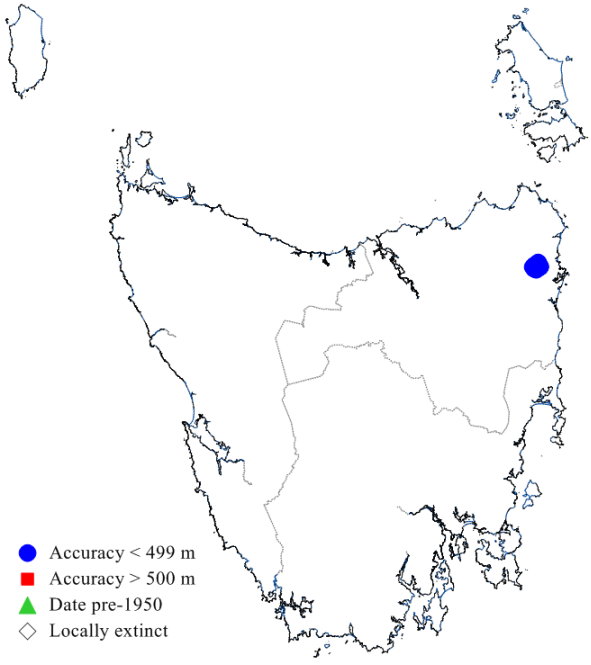

Figure 1. The distribution of Bornemisszas Stag Beetle, showing NRM regions

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

SUMMARY

Bornemisszas Stag Beetle (*Hoplogonus bornemisszai*) is a flightless, dark-coloured, ground-dwelling beetle growing to 16-30 mm in length. The male has large, distinctive mandibles (jaws). While apparently abundant within its habitat, it is confined to approximately 700 ha in north-eastern Tasmania, east of the Blue Tier. This habitat comprises damp areas of forest floor, particular in mature wet eucalypt forest, damp forest and mixed forest. A deep layer of accumulated leaf litter is vital to the survival of this species.

The primary threat 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 these activities, and an improved, wider understanding of how to limit impacts on the species, would address the key objective of maintaining and improving habitat throughout the species' range.

IDENTIFICATION AND ECOLOGY

Bornemisszas Stag Beetle (*Hoplogonus bornemisszai*) 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 softer hindwings), and rounded mandibles (jaws) with three apical teeth.

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 1996a, FPB 2002). Bornemisszas Stag Beetle ranges in total length from 19.5-29.2 mm (male), although much smaller female specimens have been detected (C. Spencer & K. Richards, pers. comm.). The species is distinguished from the other two *Hoplogonus* species with reference to the shape of the mandibles and head. For a detailed taxonomic description of Bornemisszas Stag Beetle see Bartolozzi (1996b).

It is assumed that the life history of *H. bornemisszai* is similar to *H. simsoni* (TSS 2012). The lifespan of adults is not known but may be more than 2 years, and the soil-dwelling larval stage may last as long as two years. Adults are thought to emerge during late spring - early summer, after lying dormant within 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. Females are more prevalent in late summer on the forest floor (amongst leaf litter).

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

Hoplogonus species can be differentiated by the shape of the mandibles and head of the male (Bartolozzi 1996a, FPB 2002). *H. bornemisszai* has rounded mandibles (cf. straight in *H. simsoni*) with three apical teeth (cf. two in *H. vanderschoori*).

DISTRIBUTION AND HABITAT

Bornemisszas Stag Beetle is endemic to Tasmania. The species is limited to an area of native forest in north-eastern Tasmania, east of the Blue Tier, with its range centred near the Terrys Hill area north of the Ransom River (Table 1, Figure 1).

Bornemisszas Stag Beetle occurs in mature wet eucalypt forest, damp forest and mixed forest (Munks et al. 2004). However, a number of survey records indicate that the species also

occurs in dry eucalypt forest (J. Meggs pers. comm., cited in TSS 2012). At these drier forest sites the species occurs within close proximity either to areas of wet/damp forest or moist drainage lines. In damp eucalypt forest, Bornemisszas Stag Beetle is found predominantly in wetter riparian areas (Munks et al. 2004).

The species has been reasonably well surveyed (Richards 1999, Meggs et al. 2003, Munks et al. 2004). Much of the current known range of Bornemisszas Stag Beetle is surrounded by unsuitable habitat and it is unlikely that future searches will significantly extend the range of the species. Suitable potential habitat exists on the western boundary of the range of the species but there is a line of parapatry with Simsons Stag Beetle (Munks et al. 2004).

POPULATION PARAMETERS

The only available estimate of population size for Bornemisszas Stag Beetle is from the number of beetles collected at each point locality. Munks et al. (2004) reported 94 mature individuals (identified from body parts), collected across 29 sites. The relative densities ranged from 0.2 to 3.5/m^2, with a mean (± SD) density where the beetle occurred of 0.98/m^2 (±1.01), although it occurred at a density of 3.5/m^2 at only one site. Munks et al. (2004) indicated some concerns with estimating total population size because of the species' patchy distribution, low density and cryptic habit, which contribute to difficulties in estimating densities of the species at any particular site.

The linear range of the species is about 5 km, the extent of occurrence is about 13 km^2 and area of occupancy about 700 ha. This latter estimate is provided by Munks et al. (2004), using an estimate of the area of potential habitat (defined as mature wet eucalypt forest, damp forest and mixed forest) as a surrogate for area of occupancy.

RESERVATION STATUS

None of the sites for Bornemisszas Stag Beetle occur in formal reserves on public land. Approximately 20% of potential habitat for the species occurs in informal reserves (Munks et al. 2004); 100 ha (14%) occurs in "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); and 45 ha (6%) in a private reserve established under the Tasmanian *Nature Conservation Act 2002*.

CONSERVATION STATUS

Bornemisszas Stag Beetle is listed as endangered on the Tasmanian *Threatened Species Protection Act 1995*, meeting criterion B (extent of occurrence estimated to be less than 500 km^2), specifically B1 (known to exist at no more than 5 locations – Table 1 lists 6 locations but habitat and potential occurrence is effectively continuous between several of these) and 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 threatened forest-dwelling stag beetles: 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, and illegal collection of beetles.

The primary threat to Bornemisszas 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 Bornemisszas Stag Beetle

	Location	Tenure	NRM region*	1:25 000 mapsheet	Year last (first) seen	Extent of subpopulation (ha)	Number of records / sites
1	Mother Logans Creek area	State forest	North	Blue Tier	2009 (1996?)	Unknown	4 records
2	Marguerita Ridge area	State forest	North	Blue Tier	2008 (1996?)	Unknown	10 sites
3	Terrys Hill Road area	Private property / State forest	North	Blue Tier	2007 (1996?)	Unknown	18 records
4	Ransom River tributary (Fitzgeralds Road)	State forest	North	Blue Tier	2003 (1999)	Unknown	1 record
5	Ransom River (Lottah Road)	State forest	North	Blue Tier	2008 (1999)	Unknown	13 records
6	Forester Creek area	Private property / State forest	North	Blue Tier	2001	Unknown	5 records

*NRM region = Natural Resource Management region

Habitat loss (clearing for pasture / crops or plantations): Munks et al. (2004) stated that there should be no conversion of potential habitat to plantation or clearing for agriculture within the range of the species, as this activity results in permanent loss of habitat. Parts of the species' range have already been converted to plantation / agricultural land; however, further conversion of habitat is restricted to private property.

Habitat modification (native forest silviculture): Forestry activities pose the greatest threat to Bornemisszas Stag Beetle given that much of its habitat in State forest has been identified as having potential for wood production (Munks et al. 2004). Conversion of native forest to plantation or for agriculture, and clearfell, burn and sow practices have been identified as posing the greatest threats to this species and its habitat.

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). The potential impact of activities such as fuelwood harvesting (i.e. woody debris collected for energy production) on the species is unknown, but is likely to be important.

Burning: The burning of forest habitat has the effect of removing accumulated litter and coarse woody debris, which then can take many years to re-accumulate. 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 complete removal of the habitat of the Bornemisszas Stag Beetle.

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

Illegal collection: Given the very restricted range of this species, illegal collection for purposes of selling or personal insect collections is a threat.

Climate change: The trend towards a warmer climate may increase the frequency of and exacerbate the effect of wildfire on the habitat of Bornemisszas 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 has been prepared for Tasmania's threatened stag beetles, including Bornemisszas Stag Beetle (TSS 2012).

Targeted surveys & monitoring: Richards (1999) surveyed specifically for the two most recently described species of *Hoplogonus*: *H. bornemisszai* and *H. vanderschoori*. Forestry Tasmania established a long-term study to monitor the recovery of the *H. bornemisszai* population following native forest harvesting in 2008 (Yee, Richards & Spencer unpublished report). In addition to formal surveys, anecdotal collections have identified localities, including the type locality (Bartolozzi 1996b).

Forestry management: Bornemisszas 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). Surveys are likely to be required at known sites and in potential habitat that may be affected by forestry-related proposals, to develop site-specific management recommendations to ensure the viability of the species. This consultation protocol has resulted in several surveys for the species being undertaken, new locality data recorded and reserves established for the species.

Management objectives

The main objective for the management of Bornemisszas Stag Beetle is to decrease the risk of extinction by maintaining and improving 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 public land managers.
- To better understand the species' habitat requirements within different parts of its range – undertake surveys to further clarify the range of the species.
- To better understand the impacts of forestry activities on the species – analyse and report on 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, including for private property near Terrys Hill and Forester Creek.
- To better protect the species – finalise and implement the recovery plan, 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 Bornemisszas Stag Beetle.

BIBLIOGRAPHY

Bartolozzi, L. (1996a). Description of a new species of *Hoplogonus* Parry, 1875 from Tasmania (Coleoptera, Lucanidae). *Redia* 79(1): 91–95.

Bartolozzi, L. (1996b). A new species of *Hoplogonus* Parry, 1875 (Coleoptera, Lucanidae). *Mitteilungen der Schweizerischen Entomologischen Gesellschaft* 69: 483–487.

FPB (Forest Practices Board) (2000). *Forest Practices Code 2000*. Forest Practices Board, Hobart.

FPB (Forest Practices Board) (2002). *Fauna Technical Note Series No. 11: Method for Surveying for Threatened Stag Beetle Species*. Forest Practices Board, Hobart.

Meggs, J.M., Munks, S.A. & Corkrey, R. (2003). The distribution and habitat characteristics

of a threatened lucanid beetle, *Hoplogonus simsoni*, in north-east Tasmania. *Pacific Conservation Biology* 9: 172–186.

Mesibov, R. (1994). Faunal breaks in Tasmania and their significance for invertebrate conservation. *Memoirs of the Queensland Museum* 36: 133–136.

Munks, S., Richards, K., Meggs, J., Wapstra, M. & Corkrey, R. (2004). Distribution, habitat and conservation of two threatened stag beetles, *Hoplogonus bornemisszai* and *H. vanderschoori* (Coleoptera: Lucanidae) in north-east Tasmania. *Australian Zoologist* 32(4): 586–596.

Orr, S. & Gerrand, A.M. (1998) Management decision classification: a system for zoning land managed by Forestry Tasmania. *Tasforests* 10: 1–14.

Richards, K. (1999). *Occurrence of* Hoplogonus bornemisszai *(Bornemisszas stag beetle) and* H. vanderschoori *(Vanderschoors stag beetle) in Priority Coupes, North-east Tasmania.* Unpublished report to Forestry Tasmania and the Forest Practices Board.

TSS (Threatened Species Section) (2012). *Threatened Tasmanian Stag Beetles Recovery Plan.* Department of Primary Industries, Parks, Water & Environment, Hobart.

Yee, M., Richards, K. & Spencer, C. (2008).
Monitoring the implementation and effectiveness of conservation measures for the Bornemisszas stag beetle, *Hoplogonus bornemisszai* in NE Tasmania. Establishment report. Forestry Tasmania & Forest Practices Authority, October 2008.

Prepared in June 2011 by Mark Wapstra under the provisions of the Tasmanian *Threatened Species Protection Act 1995.* Published in August 2012.

Cite as: Threatened Species Section (2012). *Listing Statement for* Hoplogonus bornemisszai *(Bornemisszas 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.