Hollows for habitat – an overview and observations

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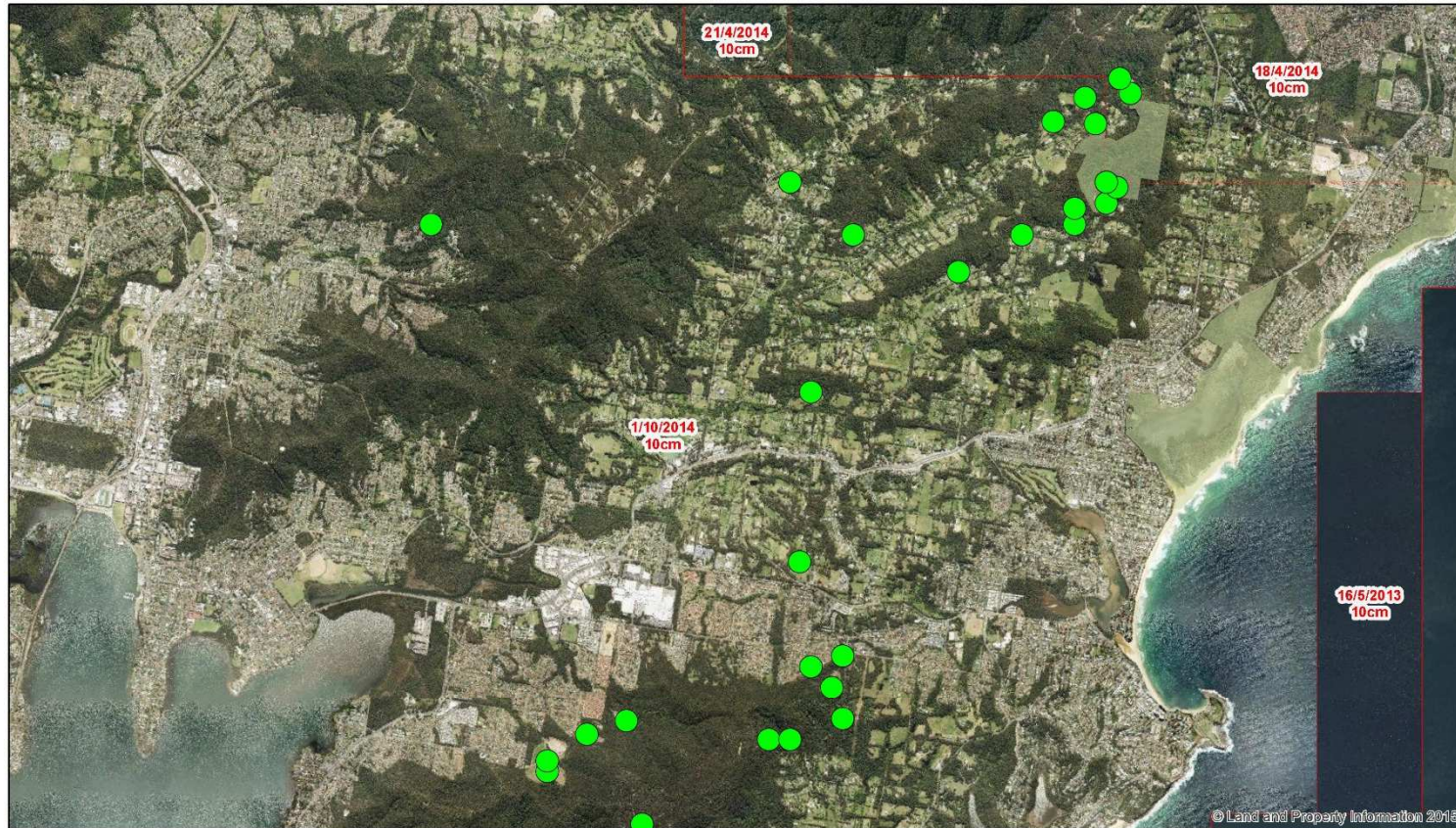**Office of Environment & Heritage**

Introduction

- **Overview:** Why are hollows important?

- **HCC landscape types and hollows:** Hollows in habitat landscapes of the HCC (remnants, corridors and matrix).

- **Natural and artificial hollows:** Hollow development lag time and the role of artificial hollows.

- **Species requirements and nest box design:** Use by hollow obligate species and Petaurid gliders.

- **Conclusion:**

Overview: Why are hollows important?

- **174 native species to NSW are reliant on tree hollows, including 40 species that are listed as threatened under the TSC Act. (Gibbons and Lindenmayer 2002; OEH 2011).**

- **Most of these species use hollows for lifecycle phases critical for the species persistence (e.g. for breeding, raising young, torpor/hibernation life phases).**

- **Hollows are therefore in demand in a range of sizes to accommodate for the range of fauna.**

HCC landscape types and hollows:

- **To compound the demand for hollows, much of the pre-1755 vegetation in the Hunter Central Coast has been cleared and what remains is mostly regrowth (relatively young forest) = low density of hollow resources.**

- **Three main landscape types in the HCC: Remnants, corridors and matrix (urban, peri-urban and agricultural).**

- **Example of landscape types: Yellow-bellied Glider survey site map.**

Landscape types, Yellow-bellied Glider research and hollow usage

Juvenile Yellow-bellied Glider (Photo: Doug Beckers)

Natural and artificial hollows

- **Natural tree hollow formation influenced by:**

  - Tree age. Can take 120 years or more to develop hollows suitable for vertebrates.

  - Tree species.

  - Landscape position (observations: gullies, edges of escarpments. Possibly influenced by logging practices).

  - Fire history and other disturbance regimes.

Natural and artificial hollows (cont.)

- **Need for mixed age forest to allow for recruitment and diversity of hollow size for range of fauna.**

- **Hollow development time-lag (>100 years) and the role of artificial hollows, particularly where hollows are uncommon.**

- **Artificial hollow applications:**

  - Relocation of hollow bearing trees as stags and CWD (e.g. Rochelle's example at Wadalba; Werris Creek Coal mine).

  - Nest box use for presence/absence surveys (DA's), ecological restoration (e.g. Coal Point), compensation for hollow removal and research.

Fauna species requirements and nest box use

- **Different species show preferences to design, and there are temporal and environmental specifics that influence use. Some examples:**

- **Microchiroptera bats**

    - Small size (driven by species size often <3cm to 23cm (Goldingay and Stevens 2009)).

    - Temperature, humidity (aspect of nest box placement - seasonal), environmental (proximity to water – Myotis).

    - Other lesser known design specifics (Mt Owen and Anna McConville's work (*Mormopterus norfolkensis*)).

    - Life cycle phases (breeding, maternity, over-wintering, dispersal).

Multi-chambered bat box
Installed in culvert.
Photo: Veronica Silver

Multi-chambered bat box Installed in culvert. Photo: Veronica Silver.

Yellow-bellied Sheathtail Bat (Large hollow) (photo: Antony von Chrismar)

Species requirements and nest box use (cont.)

- **Gliders (Squirrel and Sugar Glider)**

  - Small to medium hollow size (3 cm (Beyer and Goldingay 2006)). Sometimes as little as 2.5cm. Again driven by animal size and limiting competition with larger animals.

  - Occupancy in as little as 2 weeks after installation (pers. Obs.), though likely to be dependant on HBT densities.

  - Seasonal use depending on food resources, breeding cycles and box temperatures

  - Height – Doesn't seem to make much difference in occupancy. Though issues with predation and tampering to be considered.

Adult male Squirrel Glider investigating Eastern Pygmy Possum box

Squirrel Glider approaching rear entry nest box

Conclusion

- **Overview:** 174 native species to NSW are reliant on tree hollows, including 40 listed TSC Act species. Hollows are generally a limited resource due to disturbance regimes.

- **HCC landscape types and hollows:** There is a role for hollows in all landscape types, including remnant, corridors and matrix.

- **Natural and artificial hollows:** Time-lag in hollow development and artificial hollows can play a role if managed and monitored.

- **Species requirements and nest box use:** Diverse range of hollow obligate species and need to select appropriate design and placement of artificial hollows.