

# The Lockyer Uplands Glossy Black Cockatoo Project

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*Photo courtesy Peter Darvall*

## A citizen science project

Facilitated by Friends of Dwyers Scrub, a member group of Citizens of the Lockyer Inc.

## Project partners

SEQ Catchments  
The Glossy Black Conservancy  
Griffith University

## Project funding

SEQ Catchments  
Lockyer Valley Regional Council

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## **ACKNOWLEDGEMENTS**

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## Introduction

The Glossy Black-cockatoo (GBC) is listed as a *Vulnerable* species under the Queensland *Nature Conservation Act 1992*. To date, occurrence of the GBC in the Lockyer Valley region is known through either opportunistic sighting by individuals or bird observers' group outings. No planned on-ground survey or research on the GBC has been undertaken in the region and the full extent of GBC presence and movements is largely unknown.

One starting point in assessing the presence of GBC in an area is evidence of their feeding. The GBC feeds exclusively on the seeds of she-oak trees (*Allocasuarina* and *Casuarina* species). Cones are chewed by the bird to extract the seeds after which the chewed up cone (the ort) falls to the ground. While the presence of she-oaks indicates potential habitat, Orts are evidence of GBC use of habitat.

The impetus for this project came from the activities of Friends of Dwyers Scrub, a group of community volunteers committed to the care and protection of a local conservation park, namely, Dwyers Scrub. Believing the health of the park's biodiversity depends, to a large extent, on its landscape connectivity, the group embarked on a strategy to engage with surrounding landholders in property-level habitat management that would benefit the park. The strategy would take a step-by-step approach to introduce landholders to on-ground species and habitat assessment on their property and the experience of working with each other on a landscape scale.

The iconic nature of the GBC, the relative ease of determining their presence and their known occurrence in Dwyers Scrub was considered an appropriate species to launch the connectivity strategy. GBC sightings have been recorded for Dwyers Scrub and reported by some landholders on surrounding properties.

The project has two aims:

1. Complete an on-ground assessment of GBC presence and GBC habitat on private property in a defined area within the Lockyer Valley region; and, in doing so,
2. Engage landholders in undertaking the on-ground assessments on their properties to enhance their knowledge of the GBC and its habitat needs.

The project is conducted as a citizen science project by Friends of Dwyers Scrub in collaboration with representatives from SEQ Catchments<sup>1</sup>, The Glossy Black Conservancy<sup>2</sup> and Griffith University<sup>3</sup> who provided methodology expertise, materials and workshop inputs. Additional funding support for one of the project workshops was provided by Lockyer Valley Regional Council.

<sup>1</sup>The support provided by SEQ Catchments was partly funded through the Australian Government National Landcare Program and through contributions as part of SEQ Catchments' partner role in the Glossy Black Conservancy. For further information on SEQ Catchments see <http://www.seqcatchments.com.au/>

<sup>2</sup> The Glossy Black Conservancy is a not-for-profit consortium of government, private enterprise, researchers and the wider community working collaboratively towards Glossy Black-cockatoo conservation across SEQ and north-east New South Wales. For further information on the Conservancy see <http://www.glossyblack.org.au/>

<sup>3</sup>Griffith University is a world leader in environmental research and is a partner in the Glossy Black Conservancy. For further information on Griffith University visit [www.griffith.edu.au](http://www.griffith.edu.au)

The project area covers over 2,800 hectares of private property in the Mount Whitestone, Fordsdale, Rockmount and Stockyard Creek areas, the majority of which is zoned Rural Uplands in the Local Government planning scheme. Project findings will provide the basis for phase two of the project involving landholders in coordinated property-level GBC habitat management.

## Value of project

The project will make the following important contributions.

1. Results from landholders' surveys will provide targeted on-ground data to augment SEQ Catchments' desk top mapping of potential GBC habitat in the region (see Attachment 1).
2. Landholders' survey of habitat areas and threats to habitat will contribute to ongoing ecological research undertaken by the Glossy Black Conservancy.
3. Results from landholders' surveys will contribute to Lockyer Valley Regional Council's inventory of regional ecological resources, management of biodiversity and protection of regional connectivity.
4. Landholders will learn about GBC habitat needs, the health of habitat on their property and the importance of landscape connectivity through educational and surveying activities.
5. Lessons learned through this project can be shared with other landholder groups within the region who may be interested in coordinated property-level conservation.

## Methodology

A task group consisting of members of Friends of Dwyers Scrub and representatives from SEQ Catchments held a series of meetings to plan and design the project and form the project coordinating group. A local community group, Citizens of the Lockyer Inc, of which Friends of Dwyers Scrub is a member group, applied for a Community Environmental Grant for the project from Lockyer Valley Regional Council. A project coordinator was nominated who is a member of both Friends of Dwyers Scrub and Citizens of the Lockyer Inc.

## Sample

An initial sample of landholders representing 29 properties in the Mount Whitestone, Fordsdale, Rockmount and Stockyard Creek areas were recruited through local community networks. Subsequently, landholders from 9 properties did not complete the surveying phase while another landholder joined the project during, and completed, the surveying phase. A total of 21 properties made up the final sample covering an area of over 2,800 hectares of land with targeted, site-specific surveys undertaken within this area.

## Survey materials

SEQ Catchments and the Glossy Black Conservancy developed a survey form for landholders to undertake the property level assessments of GBC presence and habitat. A copy of the survey form, entitled *Glossy Black Cockatoo Habitat Assessment*, is included at Attachment 2.

SEQ Catchments provided each landholder with two copies of their property map to use in conjunction with the survey form. Each property map showed the property boundaries and imagery from recently flown aerial photography (2013) as well as GBC habitat areas mapped

through SEQ Catchments' desk-top assessment (as in Attachment 1). The map was to be used by landholders without access to a GPS device to mark sites to be sampled and/or additional relevant features including potential water sources and trees with hollows.

## Method

All landholders were invited to a Field Day held on 22<sup>nd</sup> November 2015 to (a) learn about GBC identification and habitat needs and the different GBC feed tree (she-oak) species and (b) receive instructions in the use of the *Glossy Black Cockatoo Habitat Assessment* form via a field demonstration on a participating landholder's property (see *Figures 1* and *2*). Seventeen landholder families attended the day, which was facilitated by Dr Guy Castley (Griffith University), and Ms Liz Gould and Mr Ross Bigwood (SEQ Catchments) with SEQ Catchments providing catering.



**Figure 1.** Dr Guy Castley (Griffith University) explains GBC features and GBC habitat needs to Landholders at the GBC Field Day in November 2015.



**Figure 2.** Landholder families attending the GBC Field Day in November 2015.

Landholders were asked to sample at least one site on their property in either a known habitat area or potential habitat area. A site was defined as a circle with a 5 metre radius or a 10 metre square. For each site sampled, the landholder completed the survey and, if possible, provided a GPS location for the site.

Landholders were advised that, if they were unable to conduct the survey themselves, members of the project coordinating team would be available to undertake their survey for them. Landholders from five properties not represented at the initial Field Day requested assistance with surveys on their properties. The surveying period was from 23<sup>rd</sup> November 2015 through to 6<sup>th</sup> February 2016.

Landholders were invited to a second workshop, the Data Collation Workshop, held on 6<sup>th</sup> March 2016. This workshop was facilitated by Friends of Dwyers Scrub with assistance from Mr Ross Bigwood and Ms Liz Gould (SEQ Catchments) and Dr Guy Castley and Mr Kaidon Anderson (Griffith University). Funding from Lockyer Valley Regional Council covered venue and catering costs.

Landholder families from 17 properties attended this workshop. The workshop involved a presentation of a summary of survey responses, a discussion of these findings with landholders followed by a hands-on mapping exercise. The latter task involved landholders forming into six small groups (see *Figures 3 and 4*). Each group was given an A1 size landscape map, which featured all participating landholders' properties with known and potential GBC habitat areas marked.



**Figure 3.** Landholders at the Data Collation Workshop discuss habitat matters with Liz Gould (SEQCatchments) and Dr Guy Castley (Griffith University).



**Figure 4.** Landholders discuss GBC presence and habitat on their properties at the Data Collation Workshop.

Landholders were asked to mark on the map (i) any relevant information that clarified/elaborated on their survey responses and/or (ii) any additional GBC presence and habitat information (e.g. water points, other known feed tree sites) relating to the whole of their property. A copy of a map showing one group's work-in-progress from these discussions is included in Attachment 3.

## Results

A total of 32 sites across 21 properties were surveyed using the Glossy Black-Cockatoo Habitat Assessment form. Landholders from 12 properties surveyed 1 site each, landholders from 8 properties surveyed 2 sites each and 1 landholder surveyed 4 sites on his property.

The five metre radius circle was used in 25 sites and a 10 metre square was used in 2 sites. Three surveys referred to the whole property as no feed trees were reported as present for the entire property. Data provided for 2 other sites did not include site dimensions.

### Sightings of Glossy Black Cockatoos

A male-female pair of GBCs was observed feeding on trees at one site while the survey was being conducted (see *Figures 4 and 5*). Photographs of the pair were presented at the Data Collation Workshop to demonstrate the distinctive female tail feather patterns. Five landholders reported seeing a GBC pair fly over their properties during the survey period while another landholder reported seeing a GBC pair fly over their property six months prior to the project. Two landholders reported GBCs feeding on their properties twelve months prior to the project.

Photo courtesy Peter Darvall



**Figure 5.** A pair of GBCs observed at a surveying site.

Photo courtesy Peter Darvall



**Figure 6.** Female GBC showing distinctive tail feather patterns.

### Evidence of orts

A total of 10 sites, across 7 properties, contained evidence of orts. Using the survey codes provided, landholders described the colour of the orts as either whitish-green (fresh), reddish-brown (few weeks old) or brown (months old). Colour can serve as an indicator of recency of GBC feeding. No orts were coded as grey (old) suggesting GBC presence in the landscape is current or recent (see *Figures 6 and 7*).

Of interest, 7 of the 10 ten sites with orts contained Forest She-oak (*A. torulosa*) while the remaining 3 contained Black She-oak trees (*A. littoralis*). The locations of the 7 ort findings were distributed across the project area.



**Figure 7.** Orts found on a site at a property in the north-east of the project area.



**Figure 8.** Orts found on a site at a property in the south of the project area.

Three sites with orts were located in the north-east of the project area, 2 were located in the south of the project area, 3 sites were located central to the project area and 2 sites were located in the west of the project area.

## Presence of feed trees

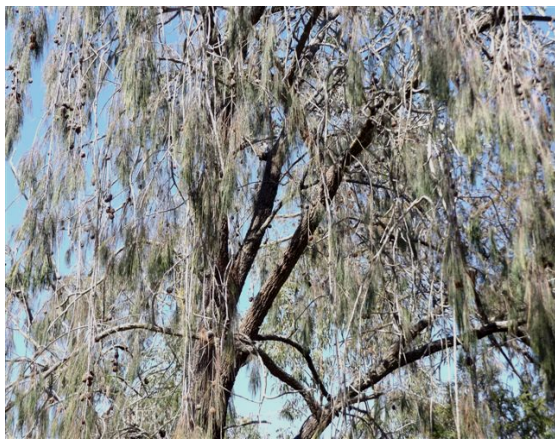
Twenty eight survey sites across 17 properties were reported to contain at least 1 species of she-oak with 1 site reported to contain a combination of she-oak species (see Table 1). Where details were provided, the numbers of trees per survey site ranged from 1 through to 17.

**Table 1.** Feed tree species observed by landholders across survey sites.

Species of she-oak observed by site	Number of sites
Black She-oak ( <i>A. littoralis</i> ) only	11
Forest She-oak ( <i>A. torulosa</i> ) only	9
Belah She-oak ( <i>A. cristata</i> ) only	7
Combination of Forest ( <i>A.torulosa</i> ) and Stringybark ( <i>A.inopholoia</i> ) She-oaks	1

Landholders were asked to estimate the percentage of she-oaks in the site which had cones (see Figures 8 and 9). Across all sites that contained she-oaks, an average of 65 percent of trees contained cones. Where a she-oak did not have cones, landholders were not asked to identify if the tree was a male she-oak.

Landholders were asked to estimate what percentage of cones on the trees was open and had released their seeds. Estimates were provided for all trees with cones except in two cases. Across all trees containing cones, an average of 19 percent of cones was open indicating the majority of cones still contain seed available to GBCs. Of note, the average percentage open was greater for Forest She-oak (46.5 percent) than for Black She-oak (14.3 percent).



**Figure 9.** Forest She-oak (*A. torulosa*) with cones.



**Figure 10.** Black She-oak (*A. littoralis*) with cones.

The estimates of open to unopened cones suggest the Forest She-oak could be maturing earlier than the Black She-oak in this landscape. This interpretation would be consistent with the ort data where the majority of orts observed were found under Forest She-oak trees. It is possible that, at least in the sites surveyed, any ongoing food source for GBCs in the current season is, potentially, more likely to come from the Black She-oak trees.

## Presence of other GBC habitat requirements

While the main focus of the project relates to the presence of GBC feed trees, the survey also asked landholders about available water sources and tree hollows, both essential GBC habitat requirements. Some landholders noted that the water and tree hollow survey questions did not specify whether they related to the survey site or the whole of the property and, hence, assumed one interpretation or the other.

Nineteen landholders answered the water source questions in relation to the whole of the property while no information was supplied for two of the properties. Eighteen of the landholders reported at least one water source on their property ranging from dams, creeks, waterholes, soakage points, storm gullies to water troughs while one landholder reported no water sources. Interestingly, this latter landholder reported two ort sites for their property with two neighbouring properties containing dams. Another landholder reported observing GBCs in previous years regularly visiting water sources on his property.

A number of landholders did not complete the tree hollow section. Of those landholders who did, some interpreted the question as referring to the survey site while others noted tree hollows within visual range of the survey site. Due to this inconsistency, the data on this section of the survey is not reported. However, it is important to note that some landholders commented that tree hollows are often used for firewood or are removed from the landscape as part of “tidying up”.

## Presence of threats to GBCs and GBC habitat

The survey also included questions relating to the presence of feral animals (on the whole of the property) and weeds (within the survey site). These questions provide an initial investigation of possible threats to GBCs and their habitat. While GBCs are most vulnerable to feral animals when using water sources, threats to habitat are more varied. For example, vine weeds such as Cat’s Claw Creeper (*Macfadyena unguis-cati*) and Madeira Vine (*Anredera cordifolia*) can destroy tree canopy thus reducing the supply of healthy feed trees while ground cover weeds such as Common Lantana (*Lantana camara*) may limit the next generation of available feed trees.

The presence of feral animals would appear widespread with one or more types of feral animal reported for 17 of the 21 properties. The maximum number reported was 6 (on each of two properties) with a median of 4 types of feral animals reported per property.

Of feral animals reported, perhaps the most threatening to GBCs are cats (9 properties), foxes (13 properties) and wild dogs (10 properties). Other reports of feral animals included pigs, deer, hares and toads. One landholder noted that, whilst a native species, noisy miners in large numbers were a potential problem for GBCs due to their aggressive protection of territory.

Seventeen landholders reported Common Lantana as being present in the survey site with densities ranging from 1- 100 percent coverage (see *Figure 11*). One landholder reported the presence of Cat’s Claw Creeper on their property while another reported Madeira Vine on their property. While ‘canopy killer’ weeds would appear not to be a major problem on the properties involved, the presence of lantana is pervasive.



**Figure 11.** Lantana was the most commonly recorded weed present in survey sites.

### Additional survey items

Landholders were also asked to indicate the presence of other nationally significant fauna species on their properties as information for future projects. Landholders reported the following observations: 4 properties reported Grey-headed Flying-fox, 3 properties reported Brush-tailed Rock-wallaby, 9 properties reported Koala and 1 property reported Black-breasted Button-quail.

Other data collected through the survey relates to fire type (planned or unplanned) and history on the properties. Fire data has not been analysed for this report but will be considered in future on-ground works for habitat management.

### Discussion

This project represents a first step in an effort by landholders to assess the presence and habitat of a *Vulnerable* native species, the Glossy Black-cockatoo (GBC), on private property in a defined area of the Lockyer Valley region. The second phase of the project will build on the current findings to encourage and assist landholders to manage GBC habitat on their properties.

The findings confirm that (a) the GBC is present and feeding in the Lockyer Uplands landscape and (b) the Lockyer Uplands contains viable GBC habitat. GBC sightings occurred in the central, western and southern areas of the landscape and feeding appears to be occurring across the breadth of the project landscape with evidence of orsts found on properties in the north-eastern, central, southern and western areas.

The majority of sites contain feed trees, predominantly the *A. littoralis* and *A. torulosa*, and the large proportion of these trees contain seed. Ort evidence, at the time of surveying, would suggest GBCs have been feeding mainly on *A.torulosa* seeds and to a lesser extent *A.littoralis*. However, coupled with landholders' observations that a greater proportion of *A.littoralis* cones are yet to open compared to the *A.torulosa* trees, it may be that different tree species mature at different times, in the project area, thus extending the period of available food for GBCs. Future efforts need to include a more detailed assessment of seed maturation timeframes of the different she-oak species

in conjunction with evidence of feeding to determine how GBCs use the landscape on a seasonal basis.

The number and variety of water sources identified across the project area suggests there is an abundance of water available for GBC use. With only one landholder observing GBCs at a water source during the surveying period, the extent of actual use of the water sources in the project area is unknown. It is reasonable to assume that the GBCs feeding within the project area would be regularly using the water sources in the area.

The range of the GBC's movements in meeting its food and water requirements is yet to be established. Further work on time of day of GBC sightings and direction of GBC movement will provide greater insight into the GBC's habits and range of territory.

The full extent of GBC presence (including numbers/groupings) and use of habitat in the project area is yet to be established given the area of land surveyed is but a tiny proportion of the combined area covered by the properties. Equally, the full extent of available feed trees is yet to be assessed along with a more focused survey of available tree hollows.

A major interest of this project is exploring the role of habitat connectivity across the landscape in sustaining GBC presence in the project area. While observations and comments by some landholders on adjoining properties would suggest GBCs are relying on food and water sources and tree hollows across property boundaries, it is not possible, at this stage, to draw any firm conclusions about connectivity. As noted above, we need to amass a great deal more observations on the range of GBC movements as they use different feed trees at different times across the landscape, which water sources they frequent and what tree hollows they are using.

Clearly, action is needed to address feral animals in the landscape, particularly cats, foxes and wild dogs. While lantana is a pervasive weed in the area, the extent to which it may be inhibiting the growth of existing or future she-oaks needs to be investigated.

This project including landholders' reports of other species of national significance being present in the landscape (for example, Grey-headed Flying-fox, Brush-tailed Rock-wallaby, Koala and Black-breasted Button-quail) adds to the extensive surveying work in this area by local community group, Citizens of the Lockyer Inc. It also attests to the ecological values inherent in the Lockyer Uplands.

The general feedback from landholders was that the project enhanced their knowledge of GBC identification and she-oak species and increased their awareness of the possibility of GBCs in the landscape. The level of landholder involvement from beginning to end of this phase of the project attests to their level of interest in habitat management for native species on their properties. Observations of landholders' interactions at workshops indicated a good deal of enthusiasm as they asked questions and offered and exchanged information about their properties.

Some methodological issues in this project need to be addressed before the next round of surveying. For example, survey items relating to water sources and tree hollows need to be clarified (for example, whole of property versus survey site focus) and methods/tools for estimating cone numbers, cone 'openness' and tree height need to be refined.

## Next steps

A number of landholders have indicated they would like to continue work on the GBC project through periodic surveying on their property, meeting as an interest group and receiving feedback from the Glossy Black Conservancy. The general consensus was to link property-level GBC surveying to the Glossy Black Conservancy's annual Birding Day.

Notably, landholders indicated a strong interest in extending their property surveying work to include other species of national significance, for example, the Koala, the Brush-tailed Rock-wallaby and the Red Goshawk to name a few.

Actions to continue work on the GBC project were identified by landholders at the Data Collation Workshop and can be summarized as follows:

- Landholders to meet approximately every six months and undertake to do at least one GBC site survey between meetings;
- Conduct a GBC and Koala surveying training day for landholders in August 2016 in preparation for landholder involvement in the Conservancy's October Birding Day and the Great Koala Count in November ;
- Develop in consultation with landholders a biodiversity survey form to include other fauna and flora species of national significance; and
- Work with SEQ Catchments to (a) address weed and pest management issues that present threats to species of national significance on landholders' properties and (b) examine opportunities for extending habitat for significant species through strategic revegetation.

The project coordinating group is committed to following up on these actions in consultation with project partners and landholders. Importantly, the project's current assessment methods need to be reviewed before any further surveying work so that findings can speak to issues around GBC range and territory and, thus, habitat connectivity.

## Promoting the GBC project

The project coordinating team networked with a number of community and non-government groups to (a) inform them of the project and/or (b) invite them to participate in either of the two workshops. Representatives from National Tree Day Lockyer attended the initial Field Day while representatives from Toowoomba Bird Observers, Toowoomba Field Naturalists and Helidon Hills-Murphys Creek Landcare Inc attended the Data Collation Workshop. Other groups which have been informed of the project and will receive a copy of this report include Friends of Lake Apex (in Gatton), Friends of Escarpment Parks (in Toowoomba) and Protect the Bush Alliance. This report has also been provided to project partners and sponsors SEQ Catchments, Glossy Black Conservancy, Griffith University and Lockyer Valley Regional Council.

## **ATTACHMENT 1**

**Copy of SEQ Catchments' desk-top mapping of Glossy Black Cockatoo potential habitat in the Lockyer Valley region (provided by SEQ Catchments to Friends of Dwyers Scrub).**

## **ATTACHMENT 2**

### **SEQ Catchments' Glossy Black Cockatoo Habitat Assessment form**

## **ATTACHMENT 3**

**Copy of a work-in-progress map produced during small group discussion at  
the landholders' Data Collation Workshop**



potential  
nesting holes here

Orts  
- hollow  
trees  
- kaala

Multiple  
hollows  
around  
this area

Highly  
likely to  
be a  
Red-tailed  
Black-Cockatoo  
nesting  
site

- Orts & feed trees
- burn ~ 30yrs ago
- possible future survey area (has steaks)
- water
- HBT