



Year 2 Evaluation
Wetlands Report

Dundonnell Brolga
Compensation Plan

9 December 2022



ODONATA
FOUNDATION


Greening Australia

Purpose of this document

To provide the Year 2 wetland monitoring report as required by the endorsed Dundonnell Wind Farm Brolga Compensation Plan (BCP), under Condition 55b of Planning Permit No. 2015/23858.

As specified by the Dundonnell Wind Farm Brolga Compensation Plan (BCP or the plan) Tilt Renewables (the Proponent) has engaged an external delivery partner to implement the Plan on its behalf. Odonata Foundation is the delivery partner and is a not-for-profit (NFP), charitable entity, whose primary purpose is to benefit the natural environment.

Odonata Foundation have partnered with Greening Australia (NFP) to oversee the on-ground restoration works and support with delivery.

This report has been prepared within 1 month from the conclusion of Year 2 (December 9 2022) as required by the BCP.

Reporting requirements

As outlined in the BCP, Year 2 Evaluation Wetland Report focuses on the progress of restoring water levels and extent, aquatic vegetation and brolga utilisation of the wetland: The evaluation includes;

1. (Section 1) A summary of results of the wetland monitoring (across all wetlands) (BCP Table 5 and 6)
2. (Section 2) An evaluation of each wetland against the performance targets, including an evaluation of the effectiveness of the wetland management measures (BCP Table 7);
3. (Section 3) Recommendations on the implementation of contingency measures (e.g. adaptive management).



We respect and honour Aboriginal and Torres Strait Islander Elders past, present and future.

We acknowledge the stories, traditions, living cultures and unceded connection of Aboriginal and Torres Strait Islander peoples to the lands and waters across Australia.

We are committed to the greatest good for the greatest number of people, wildlife and Country, leaving no one behind.

Section 1: Wetland Management Plan Measure Summary

Table 1 summarises the actions completed in Year 2 as detailed in the four wetland management plans

Site ID	Management Action Description	Timing in Management Plan	Completed / Started / Delayed	Action Summary
Fencing				
DUN-BCP-001 DUN-BCP-002 DUN-BCP-003 DUN-BCP-004	Exclude stock from wetland in Year 2	December 2020 - Ongoing	Completed	No stock to enter wetland site, unless deemed appropriate to control high biomass. DUN-BCP-001 wetland had high growth of <i>Phalaris</i> , sheep were provided access from 17 th December 2021 to 24 th December 2021 to crash graze the site and de-head <i>Phalaris</i> seed.
Herbaceous Weeds				
DUN-BCP-001 DUN-BCP-002 DUN-BCP-003 DUN-BCP-004	Control high threat weeds using chemical application of spot spraying	December 2021 – December 2022	DUN-BCP-001 - Completed DUN-BCP-002 – N/A DUN-BCP-003 – Completed DUN-BCP-004 – N/A	If required control of high threat herbaceous weeds. DUN-BCP-001 – control of <i>Phalaris</i> through grazing. DUN-BCP-003 – handpicked thistles within bare swan nest areas at the wetland July 2022.
Pest Animals				
DUN-BCP-001 DUN-BCP-002 DUN-BCP-003 DUN-BCP-004	Reactive to fox sightings - 8-week integrated program in consultation with Agriculture Victoria	Only if required	DUN-BCP-001 – No foxes seen on remote camera DUN-BCP-002 – No foxes seen on remote camera or from landholder. DUN-BCP-003 – No foxes seen on remote camera or from landholder. DUN-BCP-004 – No foxes seen on remote camera	DUN-BCP-001 – 26 foxes shot across property DUN-BCP-002 – 22 foxes shot across property DUN-BCP-003 – 9 foxes shot across property DUN-BCP-004 – no foxes shot
Supplementary Planting				
DUN-BCP-001 DUN-BCP-002 DUN-BCP-003 DUN-BCP-004	Natural regeneration to occur through exclusion of stock.	Ongoing	Stock excluded from sites	Natural regeneration is occurring at all four wetlands.
Hydrology				
DUN-BCP-001 DUN-BCP-002 DUN-BCP-003 DUN-BCP-004	Sandbag blocks in drain checked.	Completed	Completed	DUN-BCP-001 – A more robust drain block was undertaken using a combination of soil and Geofabric sandbags, ensuring sandbags made up at least 60-70% of the drain block. A solid base was made using existing onsite soil taken from a nearby soil mound (historical dam excavation). A removable capping of geo-fabric

Site ID	Management Action Description	Timing in Management Plan	Completed / Started / Delayed	Action Summary
				<p>sandbags was used across the 40m section of the drain. The block was made to the recommended sill height of 0.95m above the bottom of the dam (obtained from hydrology assessment completed by Nature Glenelg Trust). The use of removable geofabric sandbags will allow adjustment to water height if required.</p> <p>DUN-BCP-002 - site visits since the sandbags were capped with soil as effective and not requiring modifications at this stage.</p> <p>DUN-BCP-003 - sandbags were effective and didn't require any modifications.</p> <p>DUN-BCP-004 – Geofabric sandbags were used to cap over the existing bags to provide a greater resistance to deterioration.</p>
Annual reporting				
DUN-BCP-001 DUN-BCP-002 DUN-BCP-003 DUN-BCP-004	Undertake Year 2 monitoring and reporting	December 9 th 2022	Completed (completed monitoring timetable in Appendix 1)	Report completed

Table 1. Wetland Management Plan Measure Action Summary



*Section 1: Wetland Summary
Details*





Photo 1. DUN001 Wetland with the geo-fabric sandbags installed (October 2022)

DUN-BCP-001(Caramut)

Wetland Area (Fenced): 33ha

Wetland Vegetation Type: Temporary freshwater marshes and meadow

Wetland currently supports: EVC mapped (NatureKit) and on-ground assessment EVC 125 Plains Grassy Wetland (VVP).

Year 2 progress of DUN001 has seen a robust drain block implemented using a combination of soil and Geofabric sandbags, ensuring sandbags made up at least 60-70% of the drain block. A solid base was made using existing onsite soil taken from a nearby soil mound (historical dam excavation). A removable capping of geo-fabric sandbags was used across the 40m section of the drain. The block was made to the recommended sill height of 0.95m above the bottom of the dam (obtained from hydrology assessment completed by Nature Glenelg Trust). The use of removable geofabric sandbags will allow adjustment to water height if required.

Vegetation was assessed in December 2021 with another survey undertaken on the 7th of December 2022 using the Decision Support Tool V1.0 (Roberts et al. 2017) (Appendix 1) along with four permanent 120m transect lines set up to assist with providing information on aquatic vegetation cover within the wetland. A list of completed monitoring undertaken at the wetland is recorded in Appendix 2. Four permanent transects were surveyed prior to the wetland restoration and again in December 2021 to determine extent of native aquatic vegetation to meet required BCP wetland performance targets, this being '*at the end of the second wetland filling there is to be 80% or greater aquatic vegetation cover over 40% of the wetland basin within two fillings*'. Results are tabled in Appendix 3. The baseline aquatic vegetation cover in December 2020 was 3% with a mix of grasses and sedges. The December 2021 survey found 38% aquatic vegetation including grasses, sedges, rushes and forbs.

The landholder's have sighted three Brolga's on the farm on 16th May 2022 over consecutive days, with the three Brolga's feeding within the wetland on 23rd May 2022. A pair of Brolgas were also recorded on 12th September 2022 on the property. A list of all records is contained at Appendix 4 and summarised in Table 2. During fortnightly monitoring Greening Australia staff didn't see any Brolga's onsite and none have been recorded on the remote camera.

The final monitoring for the 2021 season occurred on 30th November 2021 due to the sandbags giving way and the water dispersing through the drain. The sandbags used degraded quickly from the sun and rain, along with the large volume of water being held back they gave way under the pressure. Appendix 5 provides a full list of depth post records. No water was then recorded at the wetland until 19th October 2022. The wetland extent was recorded by walking around the wetland and tracking marks through a handheld GPS (Appendix 6). This was then used with the Digital Terrain Model (DST-Lidar) to provide an assessment of the percent coverage of water at or above 30 cm within the water depth and duration map in Appendix 7. *The BCP wetland performance target is to re-establish the required inundation regime of a minimum of 30 cm inundation of 75% or more of the wetland basin for more than a full Brolga breeding event.* The wetland in October 2022 reached almost 50% inundation of 30cm or more across the basin and is currently at 40% for November 2022.

The geo-fabric sandbags which were placed 11th May 2022 to block the drain and reinstate the wetland, held up well with 70ml of rain falling 13th October 2022 resulting in floodwaters passing through and over the sandbags. Inspection during monitoring has recorded the bags are still secured in place.

No foxes were recorded on the remote camera and the landholder has undertaken fox control through a shooting program, with 26 foxes in total being shot. This occurred across the property prior to the Brolga breeding season in July.



Photo 2. Finished sandbagging at wetland drain.



Photo 3. Installed sandbag block after 70ml of rain in October 2022



Photo 4. Brolga spotted at the wetland (November 2022)



Photo 5. Brolga in the wetland (November 2022)



Photo 6. Wetland in October 2022



Photo 7. DUN002 Wetland (November 2022)

DUN-BCP-002 (Cross Roads)

Wetland Area (Fenced): 7.77ha

Wetland Vegetation Type: Temporary freshwater marshes and meadow

Wetland currently supports: EVC mapped (NatureKit) EVC 647 Sedgy Wetland (VVP). On-ground assessment EVC 125 Plains Grassy Wetland

A temporary block using sandbags was installed at the wetland outlet in Year 1, due to a high volume of water the bags degraded quickly and existing soil and rock from the original excavations were pushed back over the sandbags into the drain. This has provided a better barrier to restrict water flow to the original sill level. The drain block is working well and hasn't required further maintenance. During site visits Greening Australia staff observed a pair of Brolgas on numerous occasions including:

- 14th July
- 8th September
- 20th September
- 5th October.

There were Brolga's captured on remote cameras on:

- 15th July
- 21st July
- 9th August
- 23rd August
- 5th September
- 6th September
- 9th September
- 16th September
- 18th September
- 20th September

The pair of Brolga's had nested and were frequently recorded up until the 5th October 2022. Monitoring on 19th October 2022 after the rain event on 13th October 2022 flooded the nest out with the Brolga's not recorded at the wetland after.

Using the DST v1 method along with four permanent 120m transect lines, vegetation was assessed in December 2020 and again in December 2021. Four permanent transects were surveyed prior to the wetland restoration and again in December 2021 to determine extent of native aquatic vegetation to meet the BCP wetland performance targets, this being '*at the end of the second wetland filling there is to be 80% or greater aquatic vegetation cover over 40% of the wetland basin within two fillings*'. The aquatic vegetation cover in December 2020 was 19% (native grasses only), the following survey in December 2021 increased native grass, sedges and rushes to 86% cover.

The BCP monitoring program for water extent, depth and duration is timed fortnightly from the first fill to drying. Water depth monitoring for 2021 season concluded on 13th January 2022 once the wetland had dried out. Monitoring for the 2022 season began on 14th July with 12cm of water recorded on depth post 4. *The BCP wetland performance target is to re-establish the required inundation regime of a minimum of 30cm inundation of 75% or more of the wetland basin for more than a full Brolga breeding event.* The wetland in September and October 2022 had between 58-69% at 30cm or more coverage across the basin, reaching to 83.48% in November 2022.

No foxes were recorded on the remote camera and the landholder has undertaken fox control through a shooting program, with 22 foxes in total being shot. This occurred across the property prior to the Brolga breeding season in July.



Photo 8: Brolga captured on remote camera

Photo 9: Brolga captured on scope (20th August 2022)



Photo 10: Aquatic vegetation *Eleocharis*, *Glyceria* and *Amphibromus*



Photo 11. DUN003 Wetland (October 2022)

DUN-BCP-003 (Woorndoo)

Wetland Area (Fenced): 18ha

Wetland Vegetation Type: Temporary freshwater lakes

Wetland currently supports: EVC mapped (NatureKit) an on-ground assessment EVC 691
Aquatic Herbland / Plains Sedgy Wetland Mosaic (VVP)

There were two drains sandbagged at the original sill height in Year 1, the sandbags placed in these drains are still working with no maintenance required.

During fortnightly monitoring Greening Australia staff recorded a pair of Brolga's feeding on 8th September 2022. Black Swans (*Cygnus atratus*) were also recorded nesting in the wetland.

Vegetation was assessed in December 2020 and in December 2021 using the Decision Support Tool V1.0 (Roberts et al. 2017) along with the four permanent 120m transect lines. Four permanent transects were surveyed prior to the wetland restoration and again in December 2021 to determine extent of native aquatic vegetation to meet required BCP wetland performance targets, this being '*at the end of the second wetland filling there is to be 80% or greater aquatic vegetation cover over 40% of the wetland basin within two fillings*'. The aquatic vegetation cover in December 2020, including native grasses, sedges, rushes, and forbs was 83%, increasing to 93% in December 2021.

The BCP monitoring program for water extent, depth and duration is timed fortnightly from the first fill to drying. Water depth for 2021 season finished on 12th January 2022 once the wetland had dried out. Monitoring for the 2022 season began on 14th July 2022 with no water recorded until the 28th July 2022. *The BCP wetland performance target is to re-establish the required inundation regime of a minimum of 30cm inundation of 75% or more of the wetland basin for more than a full Brolga breeding event.* During August 2022 the wetland recorded under 1% at or above 30cm

water depth, then up to 72% in September 2022. The basin reached a peak of 95% in October to 71.59% in November 2022.

No foxes were recorded on the remote camera with 9 foxes shot across the property outside of Brolga breeding season.



Photo 12: Pair of Brolga spotted through scope on 8th September 2022



Photo 13: Aquatic forbs *Potamegeton*, *Ranunculus* and *Eleocharis*



Photo 14: Wetland reaching outside the fenced area into neighbouring paddocks (November 2022)



Photo 15. DUN004 Wetland during monitoring 8 Brolgas flew into the wetland (22 August 2022)

DUN-BCP-004 (Westmere)

Wetland Area (Fenced): 29ha

Wetland Vegetation Type: Temporary freshwater marshes and meadow

Wetland currently supports: EVC mapped (NatureKit) EVC 647 Plains Sedgy Wetland (VVP).
On-ground assessment: EVC 291 Cane Grass Wetland.

Sandbags were placed within the drain in Year 1 to allow for water levels to return to original sill height.. The sandbags were capped with geofabric sandbags prior to the wetland filling in Year 2 as the hessian bags had started to degrade.

The vegetation was initially assessed in December 2020 and again in December 2021 using the Wetland DST v1.0 (Roberts et al. 2017) along with four permanent 120m transect lines to assist with vegetation cover assessments. Four permanent transects were surveyed prior to the wetland restoration and again in December 2021 to determine the extent of native aquatic vegetation to meet BCP wetland performance targets, this being '*at the end of the second wetland filling there is to be 80% or greater aquatic vegetation cover over 40% of the wetland basin within two fillings*'. The aquatic vegetation cover across the basin in December 2020 was 66% predominately native grasses. In December 2021 the aquatic vegetation cover increased to 69%.

During fortnightly monitoring Greening Australia staff observed 8 Brolgas on 25th August 2022 that flew into the wetland. A pair of Brolga were seen on 20th of September 2022 and 5th October 2022. The Brolga's had nested with a nest seen between marker 3 and 4. One egg was observed on the nest on 20th September 2022 with the pair still onsite on 5th October 2022. A visit on 10th October 2022 to check on the pair revealed the egg had gone. Subsequent monitoring has seen the nest completely submerged with the rainfall event in October.

The BCP monitoring program for water extent, depth and duration is timed fortnightly from the first fill to drying. Water depth for 2021 season finished on 13th January 2022 once the wetland had

dried out. Monitoring for the 2022 season began on 14th July 2022 with water recorded at depth post 4. *The BCP wetland performance target is to re-establish the required inundation regime of a minimum of 30cm inundation of 75% or more of the wetland basin for more than a full Brolga breeding event.* During July to August 2022 1.22% of the wetland had 30cm or more across the basin, reaching 70.82% in October.

The remote camera captured 0 foxes in the wetland. Site visits have seen no foxes or presence of scats onsite. The landowner has undertaken no fox shooting this season.



Photo 16: Looking south over the wetland, Glyceria starting to emerge.



Photo 17: Emergent vegetation starting to grow Glyceria and Amphibromus (November 2022)

Measure	Method	Timing	Summary
		Year 1 and 2	
Brolga use of the wetland	<p>Observations of the number and age of birds.</p> <p>Observations of evidence of breeding activity, including:</p> <ul style="list-style-type: none"> - Stage of breeding (i.e. nest building, laying, incubation, parental care, fledging); - The outcomes of breeding attempts; and - Observations on factors that affect breeding activities and outcome (e.g. water level fluctuations, predation, disturbance). <p>If breeding activity is observed, then Breeding Activity Monitoring (as outlined below) will commence).</p> <p>Any Brolga breeding activity will be reported to DELWP to be added annually to the Victorian Biodiversity Atlas (VBA) database administered by DELWP.</p>	Every two months, during breeding season.	<p>Observations were recorded from on-ground monitoring, remote camera footage and landholder observations. All Greening Australia visual sightings and remote camera observations were recorded in VBA.</p> <p>Full recorded list is provided in Appendix 4. Summary of Brolga sightings are:</p> <p>DUN-BCP-001 – 1 sighting by landholder of three Brolgas feeding and foraging in wetland. No Greening Australia staff observations when onsite.</p> <p>DUN-BCP-002 – 4 sightings by Greening Australia staff of a pair of adult Brolga feeding, foraging and nesting in the wetland. 10 images captured on remote camera of Brolga's. All appear to be adult.</p> <p>DUN-BCP-003 – 1 observation of a pair of Brolga onsite during Greening Australia's monitoring.</p> <p>DUN-BCP-004 – 3 observations of Brolga by Greening Australia staff, appearing to nest from 20th September 2022. No photos captured on remote cameras.</p>
Breeding Activities	Method	Timing	Summary
Breeding behaviour	Field-based observations of evidence of breeding activity (as per the Utilisation method above).	Fortnightly from first observation of breeding behaviour	DUN-BCP-002 – Nesting behaviour noted on 20 th September 2022 with remote camera capturing Brolgas at the wetland from 5 th August. The nest went underwater from 19 th October 2022. No reattempt to nest noted.
Hatched chicks	Field-based observations of breeding success and survival of chicks.	Weekly until chick is fledged (approximately after 12 weeks).	DUN-BCP-004 – Nesting behaviour noted on 20 th September 2022. Nest was underwater from 19 th October 2022. No reattempt nest noted.

Table 2. BCP Brolga Utilisation and Breeding Monitoring Program Summary 2022.



*Section 2: Evaluation of each
Wetland against Wetland
Performance Targets*



The BCP outlines Wetland Performance Target for Year 2, these are provided below in Table 3 as well as a summary of findings, progress and recommendations.

Monitoring Measure	Key Indicator	Performance Target	Key Milestone	Summary	Recommendations
Wetland Restoration and Management					
Water extent, depth and duration	Ecologically effective inundation of each wetland during average and above average years.	A minimum 30-centimeters inundation in 75% or more of the wetland basin for more than a full Brolga breeding event. (Jul-Nov)	Re-establishment of required inundation regime.	<p>DUN-BCP-001 – 49.23% mapped in October 2022 of water depth coverage at or above 30cm, 39.70% for November</p> <p>DUN-BCP-002 – 83.48% mapped in November of water depth coverage at or above 30cm.</p> <p>DUN-BCP-003 – In October the wetland was at 95.77% coverage at or above 30cm to 71.59% in November 2022.</p> <p>DUN-BCP-004 – Currently at 70.82% coverage of 30cm or more across the basin.</p>	<p>Continue to monitor all wetlands extent, depth and duration.</p> <p>Brolgas have been present at all wetlands and noted as nesting at DUN-BCP-002 and DUN-BCP-004.</p>
Vegetation	Extent and percentage cover of suitable aquatic vegetation (i.e. rushes and sedges).	<p>a) 80% or greater aquatic vegetation cover over 40% of the wetland basin within two fillings.</p> <p>b) 80% of greater aquatic vegetation cover over 60% of the wetland within four fillings.</p> <p>c) No decline in the extent and cover of aquatic vegetation after the fourth filling.</p>	<p>a) At the end of the second wetland filling</p> <p>b) At the end of the fourth wetland filling</p> <p>c) Ongoing</p>	<p>a) End of second wetland filling aquatic vegetation cover (aquatic vegetation included native grasses suited to inundation, sedges, rushes, native forbs):</p> <p>DUN-BCP-01 – 38% aquatic vegetation cover (including native grasses, sedges, rushes and forbs), 58% exotic (predominately <i>Phalaris aquatica</i>)</p> <p>DUN-BCP-02 – 86% aquatic vegetation cover across the basin, 3% exotic</p> <p>DUN-BCP-03 – 93% aquatic vegetation across the basin with 7% exotic.</p> <p>DUN-BCP-04 – 69% coverage of aquatic vegetation cover across the wetland basin, with 2% exotic cover.</p>	<p>Continue to monitor aquatic vegetation and treat weeds.</p> <p>Although DUN-BCP-001 is under the 80% aquatic vegetation, the level of inundation this season has seen <i>Phalaris aquatica</i> die off after being submerged for an extended period. Recommend continuing to monitor and adjust management actions as required for native aquatic vegetation recovery.</p>



	Results from the DST method	DST assessment shows improvement in meeting habitat objectives	Annual and ongoing	Completed with a summary of results provided in this report (Appendix 1). All wetlands met the requirements set out in the Vegetation DST assessment conducted in December 2021 to meet habitat and EVC objectives particular to each individual wetland.	Continue to review DST and adjust relevant wetland management parameters to ensure effective habitat rehabilitation.
Brolga Utilisation and Breeding Activities					
Brolga use of the wetland	Brolga present and engaging in courting/pairing behaviour	Brolga present	Brolga present in year 3	Brolgas have been visually observed by Green Australia staff and landowners at all 4 wetlands, including on remote camera footage.	Brolga's have been present at all wetlands, although no courting or pairing behaviour observed. Continue to observe Brolga's and record behaviour. Use of decoys to attract birds is not applicable at this stage.
Nesting behaviour	Brolga pair building nest and laying eggs	Nest present, eggs laid	See above	Nests were built at 2 wetlands (DUN-BCP-002 and DUN-BCP-004). Visual observations confirmed nest were flooded after the rain event in October 2022.	Continue to observe Brolga's and record behaviour.
Wetland Restoration and Management					
Fledged young	Number of young successfully fledged.	Young successfully fledged at the average rate of about one every second year across each wetlands in the plan from year four.	N/A	N/A	Recommendations not applicable at this stage. Investigate and control any predators of eggs and young birds. Continue to review water regime management to ensure appropriate conditions long enough to produce fledglings.

Table 3: Wetland Performance Targets Summary

NOTE: Water extent and depth monitoring will continue until the wetland has dried out as defined in the BCP, at the time of reporting all wetlands were still retaining water.



*Section 3: Recommendations
on the implementation of
contingency measures*

Currently no contingency measures are required.

DUN-BCP-001

- o No adjustments required, continue monitoring.

DUN-BCP-002

- o No adjustments required, continue monitoring.

DUN-BCP-003

- o No adjustments required, continue monitoring.

DUN-BCP-004

- o No adjustments required, continue monitoring.

Odonata Statement

As the CEO of Odonata Foundation who is the responsible entity for ensuring satisfactory completion of activities defined in the BCP, I confirm that what is outlined in this report is true and correct.

Your sincerely



Sam Marwood



Appendix 1 - Vegetation Decision Support Tool results

The decision support tool (DST) is to be used within the first 1-5 years of wetland vegetation recovery. The tool uses the Ecological Vegetation Classes (EVCs) to set vegetation targets and evaluate a recovery plan. The tool evaluates three key constraints to vegetation recovery; (i) Habitat Suitability, (ii) Regeneration Potential and (iii) Establishment potential. More information on the DST can be found on Arthur Rylah website¹.

The Wetland tool (DST) requires the use of information detailed in the technical report to inform decisions about the wetland. Due to the length and nature of information a summary has been provided on the three components which make up the worksheets: Plan Worksheet, Field Worksheet and Evaluation Worksheet. These all form a conclusion to inform the manager if the wetland plan is suitable to restore based on the intended long-term goal.

All four wetlands currently meet the requirements set out in the Vegetation DST assessment conducted in 2020 and 2021 to meet habitat and EVC objectives particular to each individual wetland.

BCP-DUN001 (Caramut)

Plan Worksheet

The long-term goal for the wetland plan is to reinstate the natural flooding regime to create Brolga breeding habitat as defined in the Brolga Compensation Plan (BCP). The target and current EVC for the wetland is consistent with the DELWP NatureKit mapping and vegetation survey conducted in December 2020 by Greening Australia of EVC 125 Plains Grassy Wetland. Planned works include restoring the natural sill level by blocking the artificial outlet drain to increase the wetland holding capacity. Other activities include fencing off the wetland to manage stock access and weed control. The future plan for the wetland is to be seasonal, with a water logging and duration 1-6 months (ideally within Brolga breeding season (July-November) with a maximum sustained depth of 30-100cm.

Field Worksheet

A vegetation survey was conducted in December 2020 and found 9 species consistent with EVC 125 out of 19 species. These included but not limited to *Amphibromus nervosus* (Common Swamp Wallaby-grass), *Cycnogeton procerum* (Water Ribbons), *Eleocharis acuta* (Common Spike-sedge) and *Juncus flavidus* (Gold Rush). The follow up survey in December 2021 found 1 additional indicator species *Potamogeton tricarinatus* (Floating Pondweed).

During monitoring, the ground cover vegetation was observed to be vigorous and abundant, with variable heights of plant cover across the wetland with a mix of vegetation types (graminoid habit

¹ Roberts, J., Casanova, M.T, Morris, K. and Papas, P. (2017) The feasibility of wetland vegetation recovery: Decision Support Tool, version 1.0. Arthur Rylah Institute for Environment Research
https://www.ari.vic.gov.au/_data/assets/pdf_file/0026/90269/ARI-Technical-Report-283-Feasibility-of-wetland-vegetation-recovery-decision-support-tool-V1.0.pdf

and low lying herbs). There are no trees within the wetland or on the wetland verge. There was almost no evidence of animal droppings within the wetland. The wetland has secure fencing and gates around its entirety. Monitoring has shown the presence of waterfowl and swans to be present, no feral pigs, goats or deer are known in the area.

The wetland is within an area that has numerous other neighbouring wetlands (although appear highly modified) in the same catchment and region.

Evaluation Worksheet

The target EVC 125 based on the future hydrological characteristic of seasonal, duration (1-6 months) and depth (30-100cm) water regime provide a good match for this vegetation community. The target EVC also matches and is associated with the described wetland landscape, being number 6 Lowland Grassy Plains (Western Volcanic), with wetland component 6.8 swampy basins, swamps and lakes. Based on the information collected onsite during the vegetation survey 2020 and 2021 it is highly likely that indicator species for EVC 125 are establishing through the seed bank once the grazing pressure has been restricted. The DST 2021 indicates that the wetland recovery plan with specific interventions is continuing as planned to regenerate and provide habitat for Brolga.



BCP-DUN002 (Cross Roads)

Plan Worksheet

The long-term goal for the wetland plan is to reinstate the natural flooding regime to create Brolga breeding habitat as defined in the BCP. The current EVC for the wetland is mapped within DELWP NatureKit as EVC 647 Plains Sedgy Wetland. A vegetation survey conducted in December 2020 by Greening Australia identified species associated with EVC 125 Plains Grassy Wetland. Some wetlands can support multiple EVCs at a time and the DST requires that either both EVCs be evaluated separately with the tool or the dominant target EVC be evaluated. As ground-truthed there was one species listed as occurring within EVC 647, and 5 species within EVC 125, the latter was used for evaluation. Another assessment will be undertaken after Year 2, when vegetation species become more apparent once water regime has been reinstated.

Planned works include restoring the natural sill level by blocking the artificial outlet drain to increase the wetland holding capacity. Other activities include fencing off the wetland to manage stock access and controlling high threat weeds. The future plan for the wetland is to be seasonal, with a water logging and duration of 1-6 months (ideally within Brolga breeding season (July-November) with a maximum sustained depth of 30-100cm.

Field Worksheet

A vegetation survey was conducted at the end of November 2020 and found 5 species consistent with EVC 125 out of 19, these included *Amphibromus nervosus* (Common Swamp Wallaby-grass), *Poa labillardierei* (Common Tussock-grass), *Rytidosperma duttonianum* (Brown-back Wallaby-grass), *Eryngium vesiculosum* (Prickfoot) and *Juncus flavidus* (Gold Rush). A follow up survey was conducted in February 2022 due to Brolga being present at the site during December 2021 and January 2022. The survey found another 5 indicator species (*Epilobium billardierianum* (Willow herb), *Eleocharis acuta* (Common Spike-sedge), *Juncus holoschoenus* (Joint-leaf Rush) and *Glyceria australis* (Australian Sweet-grass), along with other native seasonal species outside the EVC.

The wetland responded to the holding of water, with an abundant mix of grasses, rushes and sedges vigorously growing across the site to various heights. *Glyceria* and *Amphibromus* plants were the tallest vegetation throughout the wetland. There are no trees within the wetland or on the wetland verge. The wetland has been fenced off from stock, with sparse or old animal droppings observed. The wetlands have supported a pair of swans nesting in addition to numerous *Porphyrio porphyrio* (Swamp hens) nesting. There are no feral pigs, goats or deer known in the area.

The wetland connects to a series of highly modified wetlands, with multiple other wetlands scattered nearby and within the catchment.

Evaluation Worksheet

The target EVC 125 based on the future hydrological characteristic of seasonal, duration (1-6 months) and depth (30-100cm) water regime still provides a good match for this vegetation community. The target EVC also matches and is associated with the described wetland landscape, being number 6 Lowland Grassy Plains (Western Volcanic), with wetland component 6.8 swampy basins, swamps and lakes. Also note that EVC 647 occurs within this wetland landscape. Based on the information collected onsite during the vegetation survey it is likely that the indicator species for EVC 125 will establish through the seed bank once grazing pressure has been controlled. The DST indicates the wetland recovery plan with the specific interventions will lead to full reestablishment.

BCP-DUN003 (Woorndoo)

Plan Worksheet

The long-term goal for this wetland plan is to reinstate the natural flooding regime to create Brolga breeding habitat as defined in the BCP. The target and current EVC for the wetland is mapped within DELWP NatureKit as EVC 691 Aquatic Herbland / Plains Sedgy Wetland Mosaic, due to no species list for the EVC, indicator species were taken from EVC 653 (Aquatic Herbland) and EVC 647 (Plains Sedgy Wetland). The hydrology works included blocking two artificial outlet drains to increase the extent and holding capacity of the wetland. The wetland is to be seasonal, with a water logging and duration of 1-6 months (ideally within Brolga breeding season (July-November) with a maximum sustained depth of 30-100cm.

Field Worksheet

A vegetation survey was conducted at the end of November 2020 and found 7 species consistent with EVC 691, these include *Potamogeton tricarinatus* s.l. (Floating Pondweed) *Amphibromus* species (Swamp Wallaby-grass), *Rytidosperma duttonianum* (Brown-back Wallaby-grass), *Eleocharis acuta* (Common Spike-sedge) and *Lobelia pratoides* (Poison Lobelia). An additional 4 indicator species were found during the 2021 vegetation survey on 22nd December, including *Myriophyllum simulans* (Amphibious water-milfoil), *Eleocharis sphacelata* (Tall Spike-sedge), *Epilobium billardierianum* (Variable Willow-herb) and *Stellaria angustifolia* (Swamp Starwort).

The groundcover was vigorous and abundant in the wetland with a mix of grasses and herbs all at variable heights. There are sparse plantings of trees around the perimeter of the wetland. The wetland has been used for grazing of stock with some old evidence of animal droppings seen. The wetland is fenced and stock are restricted from the stie. The wetland supports the presence of waterfowl and swans, there are no feral pigs, goats or deer known in the area.

The wetland itself was historically larger with connections in the landscape although highly modified to neighbouring wetlands. The site sits within a landscape of many scattered wetlands within the catchment and region.

Evaluation Worksheet

The target EVC 691 based on the future hydrological characteristic of seasonal, duration (1-6 months) and depth (30-100cm) water regime provide a good match for this vegetation community. The target EVC also matches and is associated with the described wetland landscape, being number 6 Lowland Grassy Plains (Western Volcanic), with wetland component 6.8 swampy basins, swamps and lakes. The wetland also contains a large area of *Poa labillardierei* which extends outside the wetland fenced boundary into the neighbouring paddock, this may suggest some Plains Grassy Wetland (EVC 125) on the outer edges of the wetland. Based on the information collected through desktop and onsite vegetation surveys it is likely that the indicator species for EVC 691 will continue to establish through the seed bank. The DST indicates that the wetland recovery plan with specific interventions is on track to be successful.

BCP-DUN004 (Westmere)

Plan Worksheet

The continued goal for this wetland plan is to reinstate the natural flooding regime to create Brolga breeding habitat as defined in the BCP. The EVC for this wetland is mapped within DELWP NatureKit as EVC 647 Plains Sedgy Wetland. On-ground vegetation assessment of the wetland classifies it distinctively as EVC 291 Cane Grass Wetland within the inner area with a mix of EVC 125 Plains Grassy Wetland and EVC 647 on the outer verges of the wetland. For this assessment EVC 291 was used. The completed hydrology works have blocked an artificial outlet to increase the extent and holding capacity of the wetland. The wetland is fenced with stock excluded. The plan for the wetland is to be seasonal, with a water logging and duration of 1-6 months (ideally within Brolga breeding season (July-November) with a maximum sustained depth of 30-100cm.

Field Worksheet

A vegetation survey was conducted in December 2020 and found 1 species out of 5 for the EVC abundant in the wetland, this being *Eragrostis infecunda* (Southern Cane-grass). This species grows well on very heavy grey soils which occurs within part of the wetland basin. Identifiable species outside of the Cane-grass were *Rytidosperma* species with small patches of *Juncus flavidus* (Gold Rush). A vegetation survey was conducted on 14th December 2021 with an additional 2 indicator species found including *Azolla filliculoides* (Pacific Azolla) and *Eleocharis acuta* (Common Spike-sedge). Additional indicator species were found associated with EVC 125 Plains Grassy Wetland including *Utricularia dichotoma* (Fairies Aprons), *Potamogeton tricarinatus* (Floating Pondweed), *Poa labillardierei* (Common Tussock Grass), *Glyceria australis* (Australian Sweet-grass), *Juncus holoschoenus* (Joint-leaf Rush).

The groundcover was vigorous and abundant in the wetland with dense swards of *Eragrostis* and *Glyceria*. The height of the *Eragrostis* and *Glyceria* was medium to high, decreasing in height the further out from the centre of the wetland. There are a few sporadic plantings of native trees around the perimeter of the wetland with a few remnant *Eucalyptus camaldulensis* (River Red Gum) on the outer western verge of the wetland. The wetland has had stock excluded with no animal droppings seen. During monitoring of the wetland, there has been waterfowl and swans present. There are no feral pigs, goats or deer known in the area.

The wetland connects to a series of wetlands in reasonable condition and forms one of many in the landscape, catchment and region which aids the wetland for re-establishment of indicator species as listed in the target EVC.

Evaluation Worksheet

The target EVC 291 based on the hydrological characteristic of seasonal, duration (1-6 months) and depth (30-100cm) water regime are a good match for this vegetation community. The target EVC matches and is associated with the described wetland landscape, being number 6 Lowland Grassy Plains (Western Volcanic), with wetland component 6.8 swampy basins, swamps and lakes. Based on the information collected through the ongoing vegetation surveys it is likely that the indicator species for EVC 291 will establish through the seed bank along with EVC 125 Plains Grassy Wetland. The DST indicates that the wetland recovery plan with the specific interventions is on track to be successful.

Appendix 2. Completed Monitoring Timetable

The following tables provides a list of dates and completed activities conducted as stated in the BCP for Year 1 for each wetland.

DUN-BCP-001 Caramut Monitoring Timetable

Wetland ID	Date	Completed ✓			
		Map Water Extent (Fortnightly July-November)	Measure Depth Marker Posts (Fortnightly July-November)	Brolga Observations (2 monthly July-November)	Vegetation DST Survey (Annually in December)
DUN-BCP-001	30/11/2021 (final water extent, depth survey for 2021 season)	✓	✓		
	07/12/2021				✓
	14/07/2022	✓	✓	✓	
	28/07/2022 (postponed due to Covid isolation 02/08/2022)	✓	✓		
	25/08/2022	✓	✓		
	09/09/2022	✓	✓	✓	
	20/09/2022	✓	✓		
	04/10/2022	✓	✓		
	19/10/2022	✓	✓	✓	
	02/11/2022	✓	✓		

DUN-BCP-002 Cross Roads Monitoring Timetable

Wetland ID	Date	Completed ✓			
		Map Water Extent (Fortnightly July-November)	Measure Depth Marker Posts (Fortnightly July-November)	Brolga Observations (2 monthly July-November)	Vegetation DST Survey (Annually in December)
DUN-BCP-002	14/12/2021	✓	✓		
	20/12/2021	✓	✓		
	03/01/2021	✓	✓	✓	
	13/01/2021	✓	✓		
	15/02/2021	✓	✓		✓
	14/07/2022	✓	✓	✓	
	28/07/2022 (postponed due to Covid isolation 02/08/2022)	✓	✓		
	25/08/2022	✓	✓		
	08/09/2022	✓	✓	✓	
	20/09/2022	✓	✓		
	05/10/2022	✓	✓		
	19/10/2022	✓	✓	✓	
	02/11/2022	✓	✓		

DUN-BCP-003 Woorndoo Monitoring Timetable

Wetland ID	Date	Completed ✓			
		Map Water Extent (Fortnightly July-November)	Measure Depth Marker Posts (Fortnightly July-November)	Brolga Observations (2 monthly July-November)	Vegetation DST Survey (Annually in December)
DUN-BCP-003	14/12/2021	✓	✓	✓	
	22/12/2021	✓	✓		✓
	09/08/2021	✓	✓		
	03/01/2022	✓	✓	✓	
	12/01/2022	✓	✓		
	14/07/2022	✓	✓	✓	
	28/07/2022 (postponed due to Covid isolation 02/08/2022)	✓	✓		
	25/08/2022	✓	✓		
	08/09/2022	✓	✓	✓	
	20/09/2022	✓	✓		
	04/10/2022	✓	✓		
	20/10/2022			✓	
	02/11/2022	✓	✓		

DUN-BCP-004 Westmere Monitoring Timetable

Wetland ID	Date	Completed ✓			
		Map Water Extent (Fortnightly July-November)	Measure Depth Marker Posts (Fortnightly July-November)	Brolga Observations (2 monthly July-November)	Vegetation DST Survey (Annually in December)
DUN-BCP-004	14/12/2021	✓	✓	✓	✓
	22/12/2021	✓	✓		
	03/01/2022	✓	✓		
	13/01/2022	✓	✓	✓	
	14/07/2022	✓	✓	✓	
	28/07/2022 (postponed due to Covid isolation 02/08/2022)	✓	✓		
	25/08/2022	✓	✓		
	08/09/2022	✓	✓	✓	
	20/09/2022	✓	✓		
	05/10/2022	✓	✓		
	19/10/2022	✓	✓	✓	
	02/11/2022	✓	✓		

Appendix 3. Vegetation Transect Data Summary

Wetland	Date	Vegetation Type % Coverage							
		Bare Ground	Native Grasses	Sedges & Rushes	Native Forbs	Water	Exotic	Animal Droppings	Dead Vegetative Matter
DUN-BCP-001	10/12/2020	28	1	2	0	0	41	1	28
	07/12/2021	4	2	12	24	1	58	0	0
DUN-BCP-002	30/11/2020	36	19	0	0	0	42	3	0
	15/02/2021	12	56	30	0	0	3	1	0
DUN-BCP-003	18/11/2020	4	65	8	10	0	0	0	0
	22/12/2021	0	42	37	14	7	0	0	0
DUN-BCP-004	08/12/2020	15	65	1	0	8	6	0	5
	14/01/2022	4	65	3	1	25	2	0	0

Appendix 4. Brolga Sighting Records

Records of Brolga sightings at each individual wetland during required monitoring.

DUN-BCP-001 Caramut Brolga Sighting Records

Wetland ID	Date	Brolga Sightings			
		Number	Age	Breeding	Comments
DUN-BCP-001	16/05/2022	3	Adult	No	Recorded by landholder in paddock foraging
	17/05/2022	3	Adult	No	Recorded by landholder in paddock foraging
	23/05/2022	3	Adult	No	Feeding in wetland, recorded by landholder
	14/07/2022	0	-	-	Brolga Observation Date
	09/09/2022	0	-	-	Brolga Observation Date
	23/09/2022	2	Adult	No	Recorded by landholder in paddock foraging
	19/10/2022	0	-	-	Brolga Observation Date

DUN-BCP-002 Cross Roads Brolga Sighting Records

Wetland ID	Date	Brolga Sightings			
		Number	Age	Breeding	Comments
DUN-BCP-002	03/01/2021	-	-	-	Brolga Observation Date
	14/07/2022	2	Adult	No	Brolga Observation Date - Greening Australia staff visual observation - foraging
	15/07/2022	1	Adult	No	Captured on remote camera
	21/07/2022	1	Adult	No	Captured on remote camera
	09/08/2022	1	Adult	No	Captured on remote camera
	23/08/2022	1	Adult	No	Captured on remote camera
	05/09/2022	1	Adult	No	Capture on remote camera
	06/09/2022	1	Adult	No	Captured on remote camera
	08/09/2022	2	Adult	No	Brolga Observation Date - Greening Australia staff visual observation
	09/09/2022	1	Adult	No	Captured on remote camera
	24/08/2021	2	Adult	No	Greening Australia staff visual observation
	21/09/2021	2	Adult	No	Greening Australia staff visual observation
	16/09/2022	1	Adult	No	Captured on remote camera
	18/09/2022	1	Adult	No	Captured on remote camera
	20/09/2022	1	Adult	Yes	Captured on remote camera and Greening Australia staff visual observation. Appears to be a fresh made nest.
	05/10/2022	2	Adult	Yes	Greening Australia staff visual observation, Brolga feeding up the back, then came down to front of wetland where one Brolga sat on nest.
19/10/2022	-	-	-	Brolga Observation Date	

DUN-BCP-003 Woorndoo Brolga Sighting Records

Wetland ID	Date	Brolga Sightings			
		Number	Age	Breeding	Comments
DUN-BCP-003	14/12/2021	-	-	-	Brolga Observation Date
	03/01/2022	-	-	-	Brolga Observation Date
	14/07/2022	-	-	-	Brolga Observation Date
	08/09/2022	2	Adult	No	Brolga Observation Date - Greening Australia staff visual observation, Brolga's foraging in wetland.
	20/10/2022	-	-	-	Brolga Observation Date

DUN-BCP-004 Westmere Brolga Sighting Records

Wetland ID	Date	Brolga Sightings			Comments
		Number	Age	Breeding	
DUN-BCP-004	14/12/2021	-	-	-	Brolga Observation Date
	13/01/2022	-	-	-	Brolga Observation Date
	14/07/2022	-	-	-	Brolga Observation Date
	08/09/2022	-	-	-	Brolga Observation Date
	25/08/2022	2	Adult	No	Greening Australia staff visual observation of 8 Brolgas in wetland, flew in while onsite and started foraging.
	20/09/2022	2	Adult	Yes	Greening Australia staff visual observation, pair of Brolga up the back of wetland, nest between depth marker 3 and 4. Nest had one egg in it.
	05/10/2022	2	Adult	Yes	Pair of Brolga nesting in wetland, protective over nest when crow came in to look around.
	10/10/2022	0	-	-	Brolgas gone and nest empty
	19/10/2022	-	-	-	Brolga Observation Date



Appendix 5. Depth Marker Post Records

Fortnightly monitoring was undertaken at each wetland to record measurements on the 4 depth marker posts and results are presented in the tables below.

DUN-BCP-001 Caramut Water Depth Post Fortnightly Measurements (cm)

Wetland ID	Date	Marker Post Depth (cm)			
		1 (shore)	2	3	4 (deepest)
DUN-BCP-001	30/11/2021	0	20	0	0
	14/07/2022	0	0	0	0
	28/07/2022 (postponed due to Covid isolation 02/08/2022)	0	0	0	0
	25/08/2022	0	0	0	0
	09/09/2022	0	0	0	0
	20/09/2022	0	0	0	0
	04/10/2022	0	0	0	0
	19/10/2022	22	64	38	34
	02/11/2022	26	68	43	38

DUN-BCP-002 Cross Roads Water Depth Post Fortnightly Measurements (cm)

Wetland ID	Date	Marker Post Depth (cm)			
		1 (shore)	2	3	4 (deepest)
DUN-BCP-002	14/12/2021	0	26	28	42
	20/12/2021	0	12	12	32
	03/01/2021	0	10	10	30
	13/01/2021	0	0	0	22
	14/07/2022	0	0	0	12
	28/07/2022 (postponed due to Covid isolation 02/08/2022)	0	13	10	30
	25/08/2022	8	30	28	50
	08/09/2022	18	40	40	60
	20/09/2022	20	44	44	60
	05/10/2022	20	44	44	60
	19/10/2022	30	52	50	70
	02/11/2022	60	76	76	86

DUN-BCP-003 Woorndoo Water Depth Post Fortnightly Measurements (cm)

Wetland ID	Date	Marker Post Depth (cm)			
		1 (shore)	2	3	4 (deepest)
DUN-BCP-003	14/12/2021	0	19	30	58
	22/12/2021	0	14	25	56
	03/01/2022	0	6	6	48
	12/01/2022	0	4	4	46
	14/07/2022	0	0	0	0
	28/07/2022 (postponed due to Covid isolation 02/08/2022)	0	0	0	33
	25/08/2022	0	13	18	50
	08/09/2022	Brolgas in wetland unable to see depth markers			
	20/09/2022	8	27	Unable to see	Unable to see
	04/10/2022	26	25	Unable to see	Unable to see
	20/10/2022	28	37	Unable to see	Unable to see
	02/11/2022	35	Unable to see	Unable to see	Over 1m



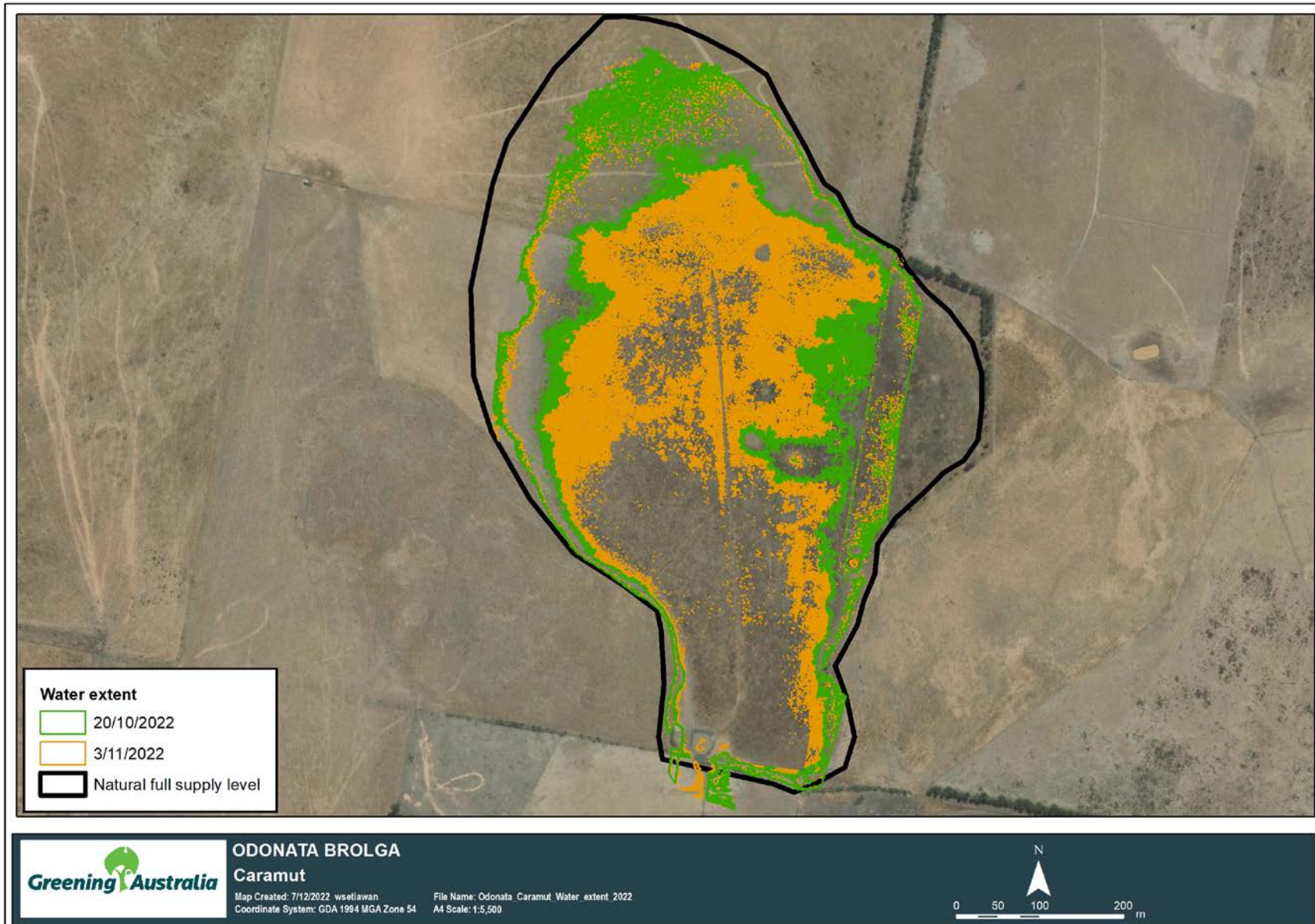
DUN-BCP-004 Westmere Water Depth Post Fortnightly Measurements (cm)

Wetland ID	Date	Marker Post Depth (cm)			
		1 (shore)	2	3	4 (deepest)
DUN-BCP-004	14/12/2021	0	12	12	22
	22/12/2021	0	6	6	12
	03/01/2022	0	0	0	6
	13/01/2022	0	0	0	6
	14/07/2022	0	0	0	10
	28/07/2022 (postponed due to Covid isolation 02/08/2022)	0	4	4	13
	25/08/2022	0	13	13	23
	08/09/2022	2	16	16	26
	20/09/2022	4	18	18	27
	05/10/2022	Brolgas in wetland unable to see depth markers			
	19/11/2022	58	72	70	80
	02/11/2022	61	76	76	86

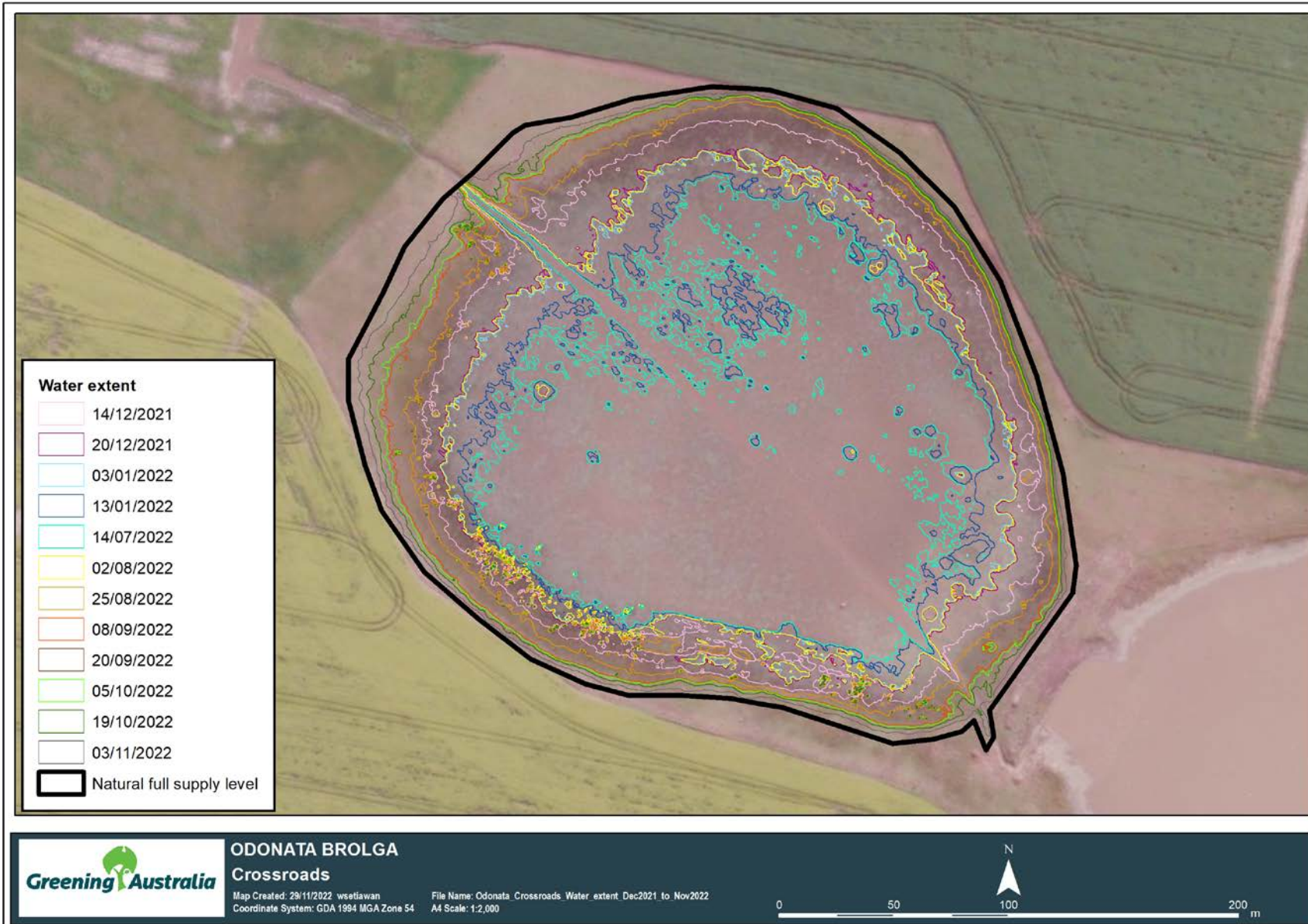
Appendix 6. Wetland Extent Mapping

Wetland extent maps were created each fortnight by walking around each individual wetland and tracking using a handheld GPS. Each date listed on the map reflects the water extent on that day. The bold green line (natural full supply level) was used from the hydrology reports conducted by Nature Glenelg Trust.

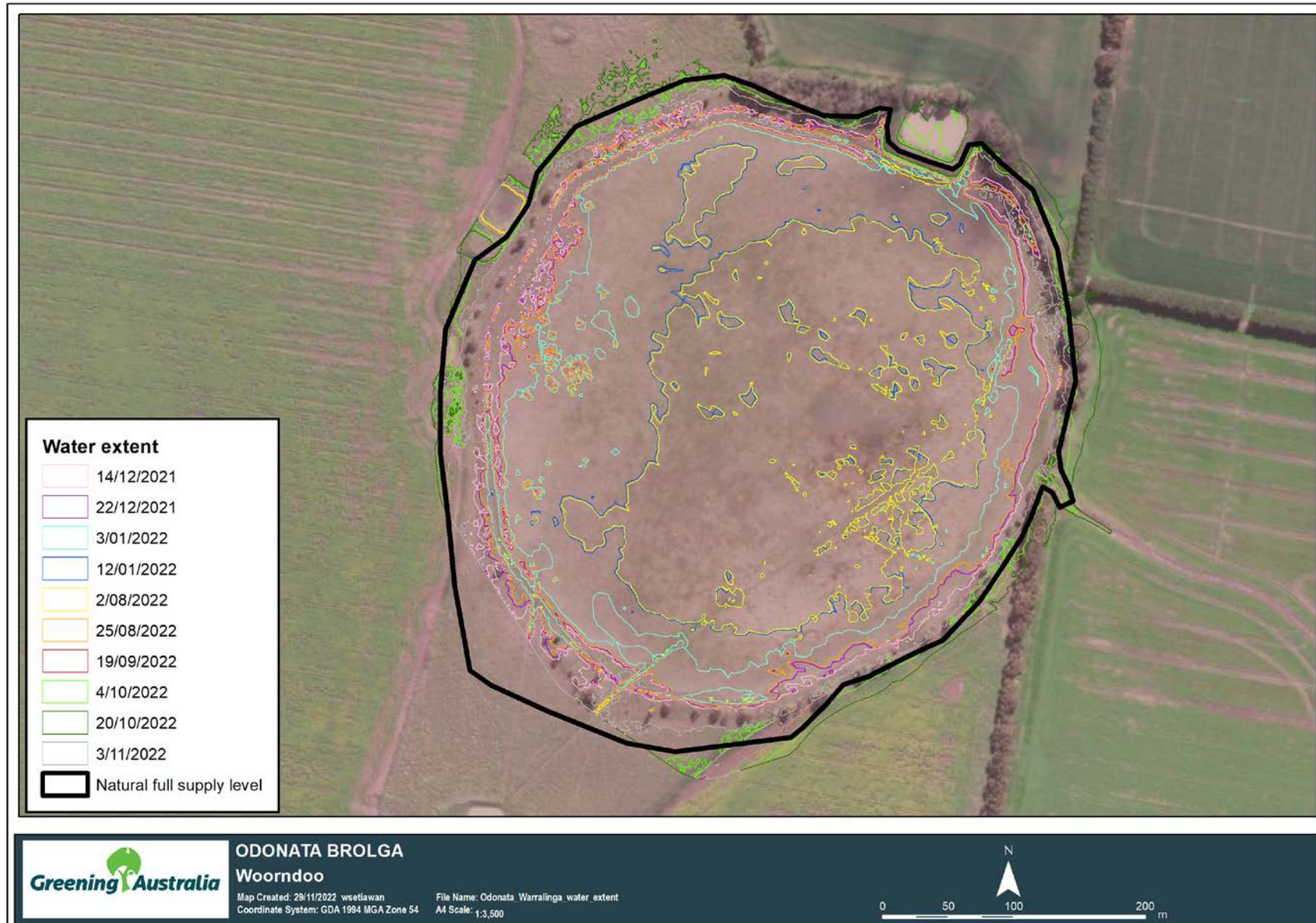
DUN-BCP-001 Caramut



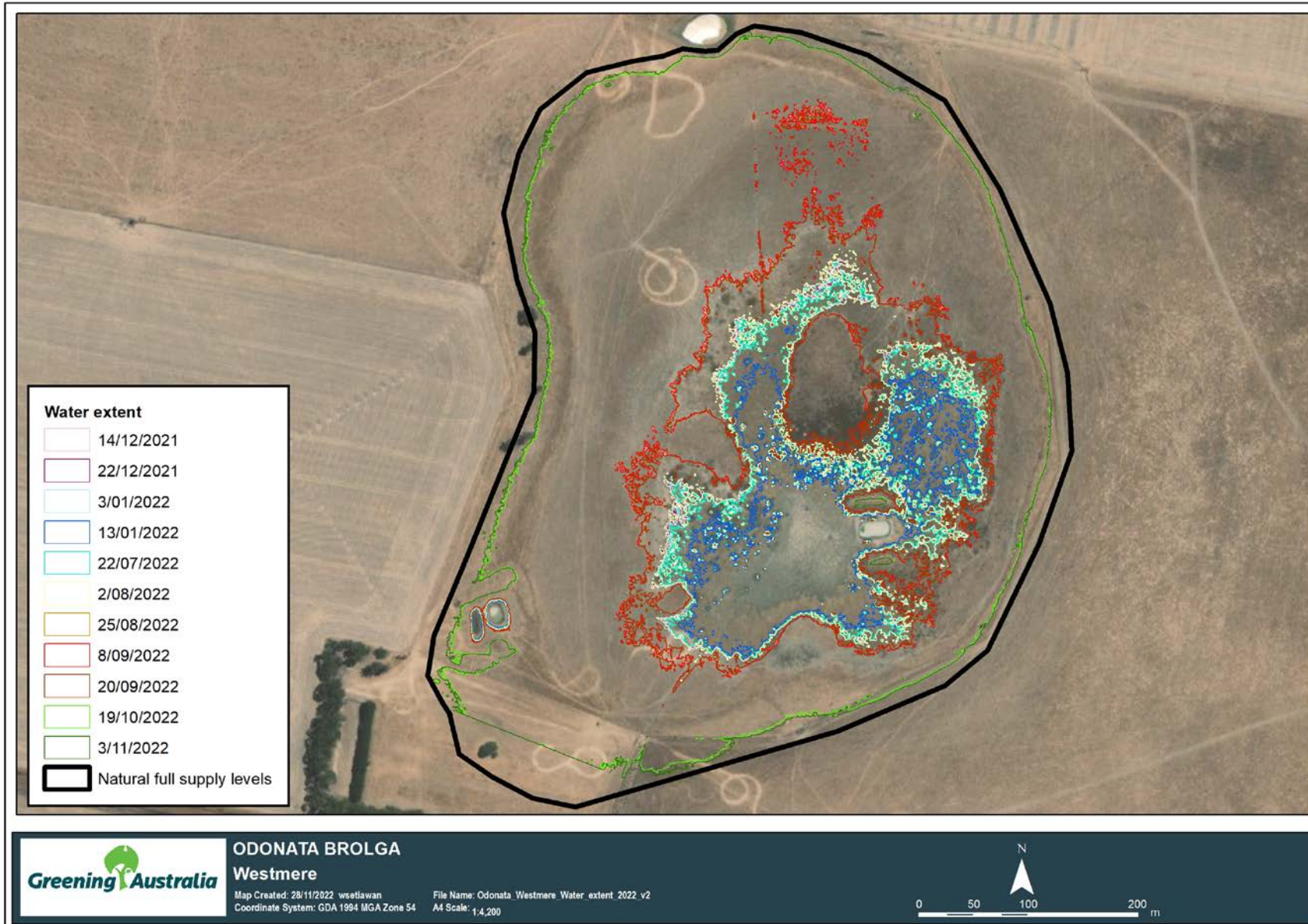
DUN-BCP-002 – Cross Roads



DUN-BCP-003 - Woorndoo



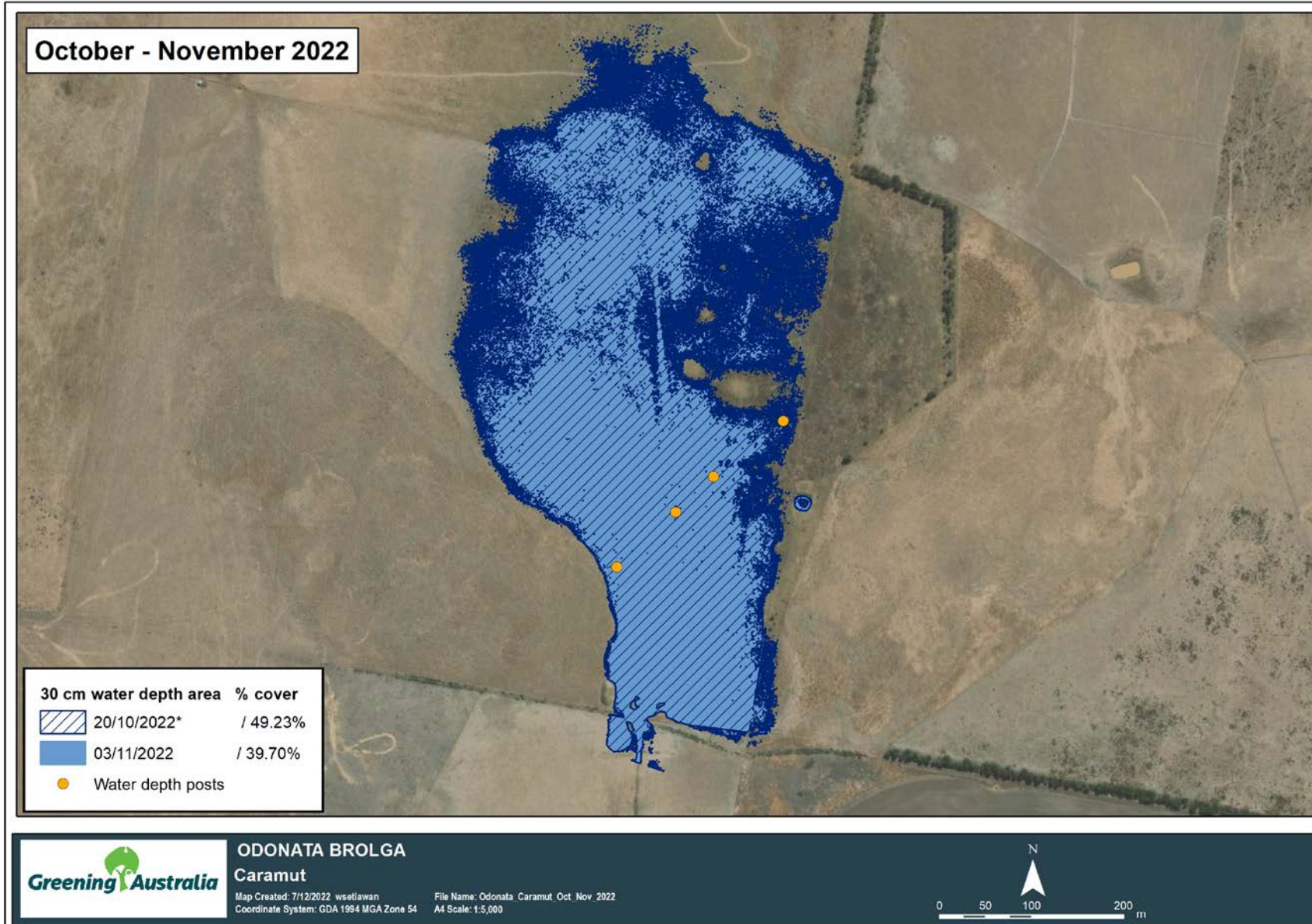
DUN-BCP-004 - Westmere



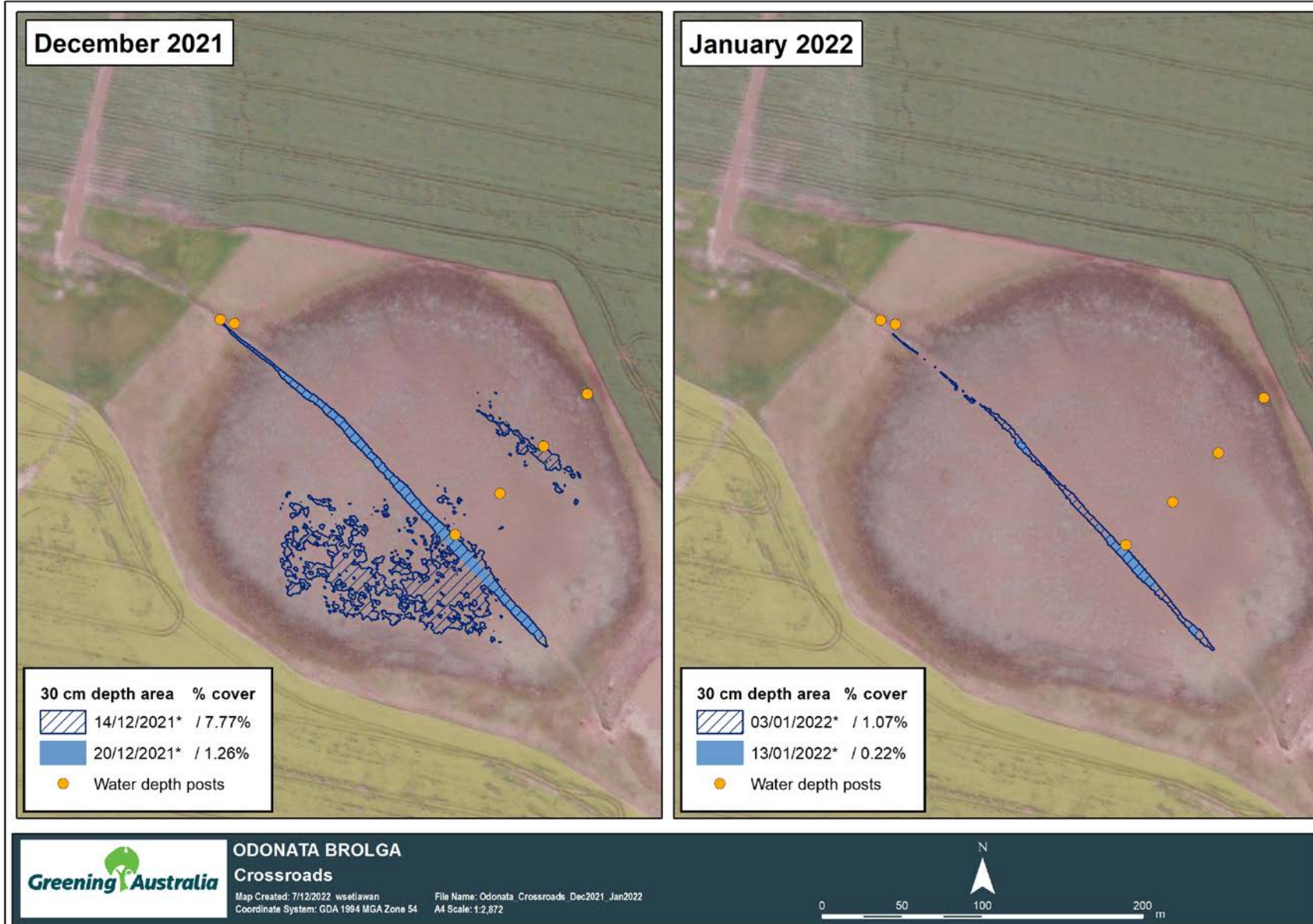
Appendix 7. Water Depth and Duration Maps

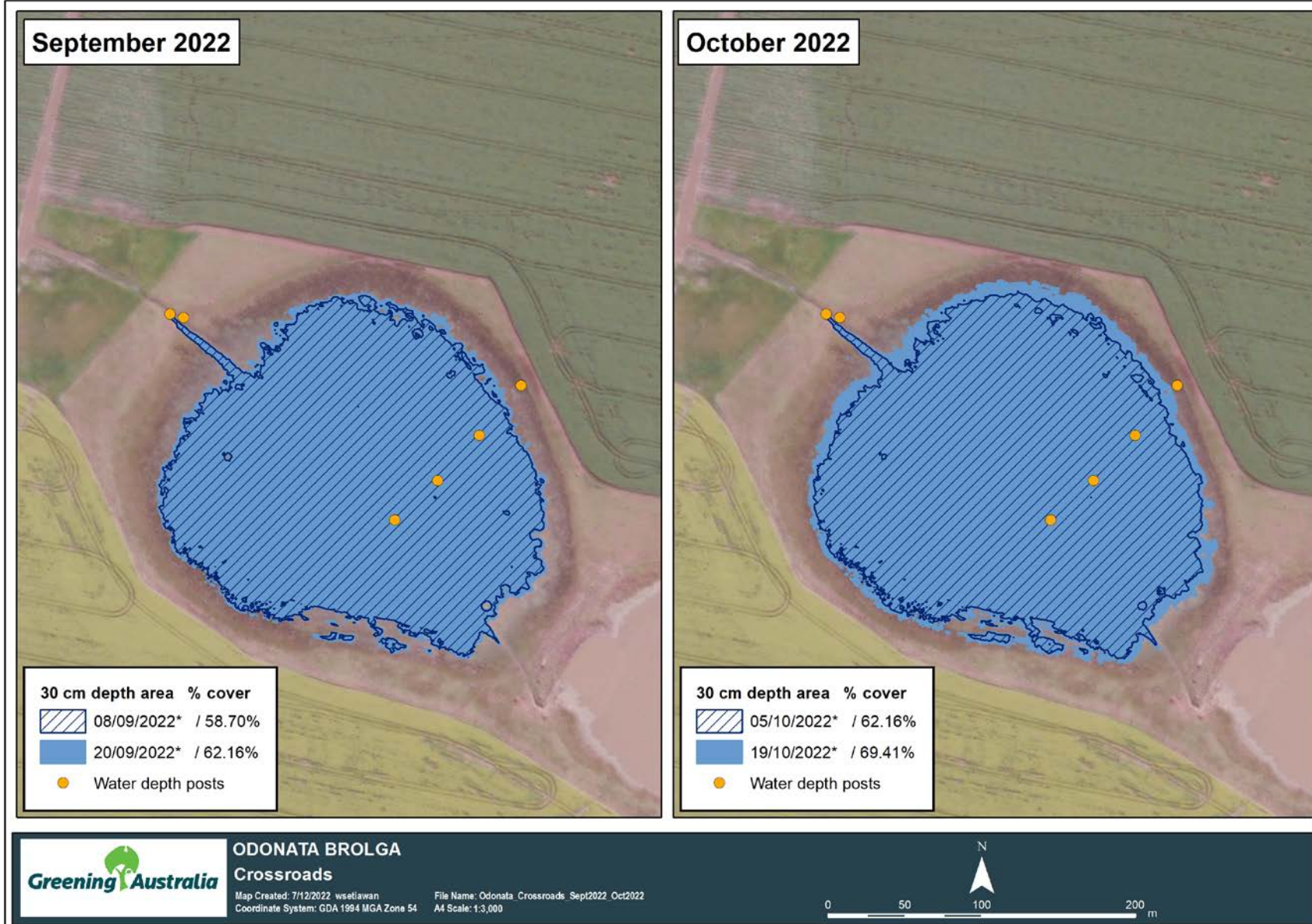
Water depth and duration maps were modelled from the data collected from the fortnightly wetland extent marks and extracting values from the Digital Terrain Model (DTM – Lidar) to create a mean estimate of water heights to assist in determining if the wetland met the BCP performance target of 30cm coverage over 75% of the basin for a full Brolga breeding event (Jul-Nov).

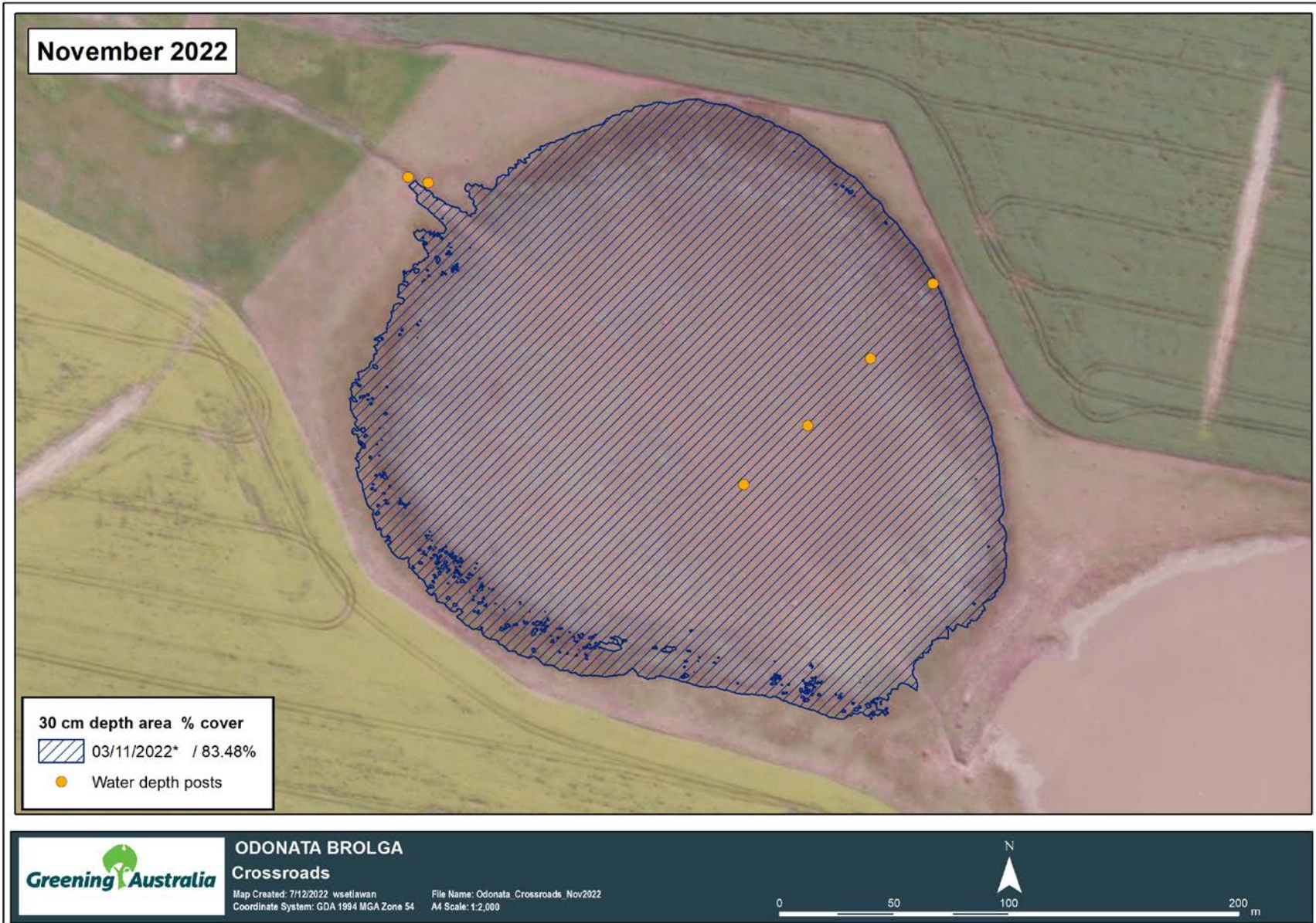
DUN-BCP-001 Caramut



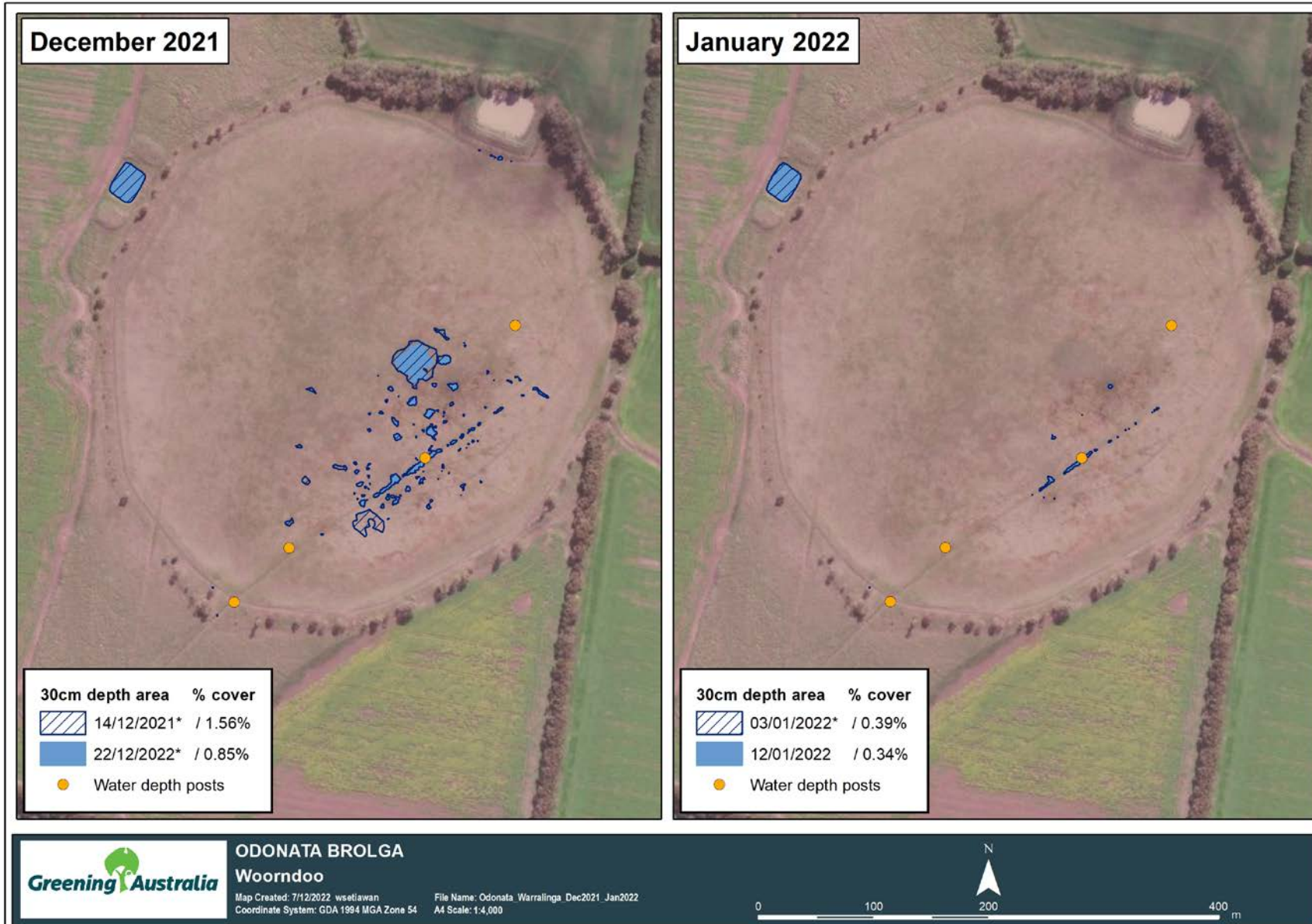
DUN-BCP-002 Cross Roads

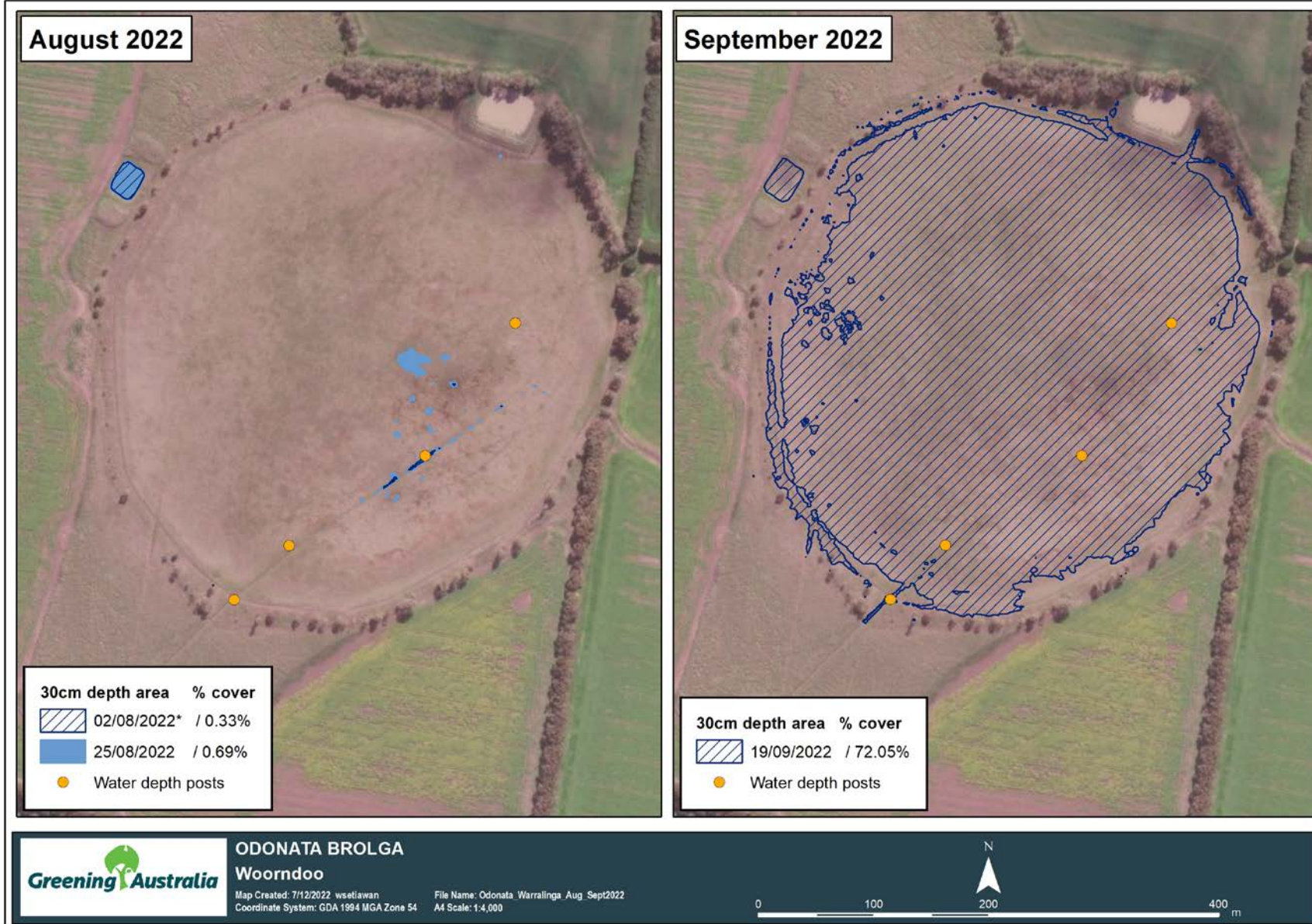


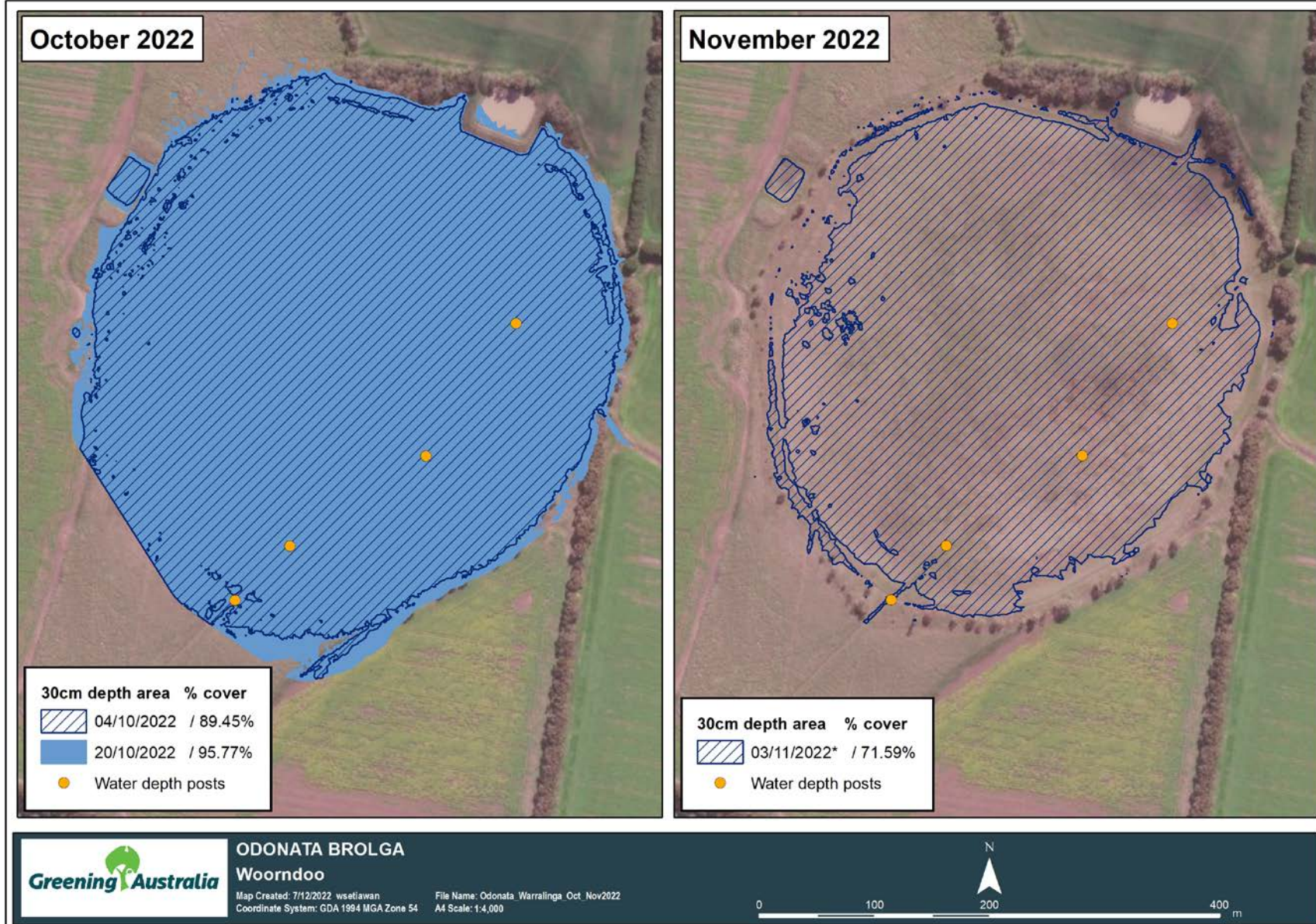




DUN-BCP-003 Woorndoo







DUN-BCP-004 Westmere

