Year 1 Evaluation Wetlands Report

Dundonnell Brolga Compensation Plan

9 December 2021

ODONATA FOUNDATION

Greening Australia

As specified by the BCP 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 1 (December 9 2021)[1] as required by the BCP.

Reporting requirements

As outlined in the BCP, Year 1[1] 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).

[1] As defined within the BCP, Year 1 commences (and Year 0 concludes) concurrently with the commencement of operations of the Dundonnell Wind Farm (to ensure alignment with the commencement of the implementation of the Brolga Monitoring Plan).

Whilst commissioning of the wind farm has been unexpectedly delayed with the intended commencement of operations not likely to be reached until early 2021. Dundonnell Wind Farm Pty Ltd have had a number of discussions with DELWP and Council and will consider the wind farm operational for the purpose of Planning Permit No. 2015/23858 from the day in which the project was given approval the ongoing testing of all 80 turbines by AEMO. This was reached on Monday 9 November 2020.

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.

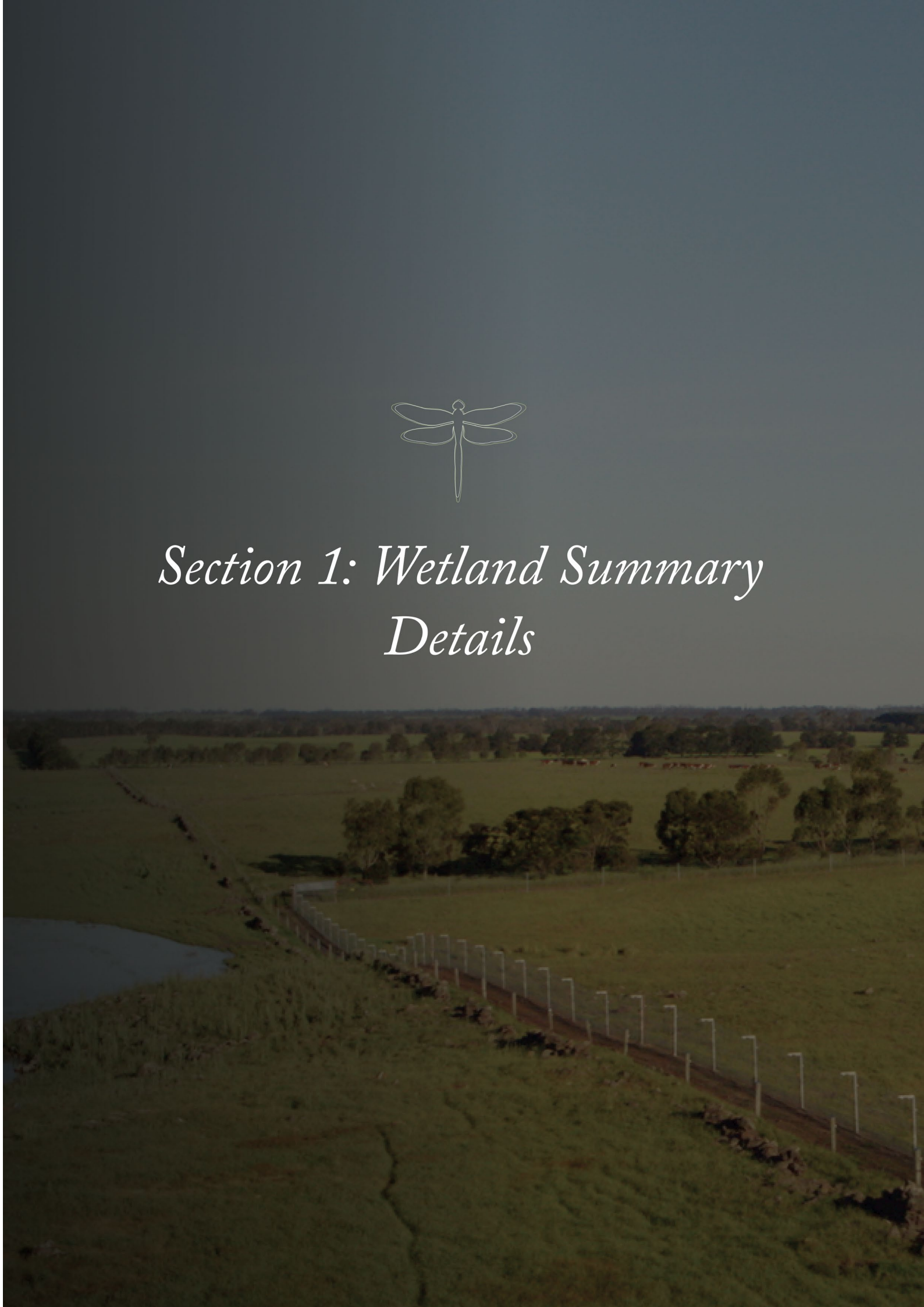
We are committed to the greatest good for the greatest number of people, wildlife and Country, leaving no one behind.

Section 1: Wetland Management Plan Measure Summary

This summary table summarised the actions completed in year 1 as detailed in the four wetland management plans

Site ID	Management Action Description	Timing in Management Plan	Completed / Started / Delayed	Target to be achieved
Fencing				
DUN-BCP-001 DUN-BCP-002 DUN-BCP-003 DUN-BCP-004	Install fencing to exclude the wetland from stock access.	December 2020	Completed	Stock is excluded from the wetland site.
	Exclude stock from wetland Year 1.	December 2020	Completed	No stock to enter wetland site, unless deemed appropriate to control high biomass.
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 2020-June 2021	DUN-BCP-001 DUN-BCP-002 – Completed spraying of variegated thistle (*Silybum marianum (L.) Gaertner*) (April 2021) DUN-BCP-003 DUN-BCP-004	If required control of high threat herbaceous weeds.
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 – 5 foxes shot on paddocks neighbouring wetland 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 – Four foxes captured on remote camera.	Reduce fox predation on Brolga's through a targeted program implemented with landholders outside of Brolga breeding season (Jan-June 2022).
DUN-BCP-004	Harbour removal – remove rubbish piles	December 2020	Completed	Old fencing removed
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. Assessment after Year 2 of vegetation will determine if wetlands replanting plans are needed.
Hydrology				
DUN-BCP-001 DUN-BCP-002 DUN-BCP-003 DUN-BCP-004	Temporary measures employed, sandbag block in drain.	Completed	Completed	Set sandbags in drain. DUN-BCP-001 required multiple visits to re-stock sandbags and ensure water was held back. In November 2021 the sandbags broke and a large volume

Site ID	Management Action Description	Timing in Management Plan	Completed / Started / Delayed	Target to be achieved
				of water was lost. Excavated soil from the drain and dam will be used to push soil back into the outlet and form a better block, this will assist with raising water levels to the required depth. DUN-BCP-002 sandbags required continuous visits to re-lay bags due to degradation. To assist with this the excavated soil from the drain was used and pushed into the outlet to form a more robust block. DUN-BCP-003 sandbags were effective and didn't require any modifications. DUN-BCP-004 required a follow up visit with more bags placed in the drain. A capping will be required to ensure sandbag integrity is upheld.
Annual reporting				
DUN-BCP-001 DUN-BCP-002 DUN-BCP-003 DUN-BCP-004	Undertake Year 1 monitoring and reporting	December 9th 2021	Completed (completed monitoring timetable in Appendix 1)	Report completed



Section 1: Wetland Summary Details

Photo 1. DUN001 Wetland after the sandbag block was installed (August 2021)

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 1 progress of DUN001 has seen sandbags used to create a temporary block to allow time for monitoring and ensure no negative impacts to the wetland. A fence has been installed using plain wire to ensure stock access is controlled. Vegetation was assessed in December 2020 and December 2021 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.

The landholder's have sighted a pair of Brolga feeding within the wetland and frequenting over consecutive days (16th, 17th and 18th May, 24th and 25th July,19th September) a list of all records is in Appendix 3. During fortnightly monitoring Greening Australia staff didn't see any Brolga's onsite and none have been recorded on the remote camera. There were numerous other bird species utilising the site, of note approximately 55 Latham's Snipe (*Gallinago hardwickii*) observed on the 6th of October 2021, with continued sightings in October and November.

From the 14th of July the depth marker Post 2 has recorded 30cm or above water depth, with the highest level on the 9th of August at 50cm, see Appendix 4 for a full list of depth post records. The wetland extent was recorded by walking around the entire wetland and tracking marks through a handheld GPS (Appendix 5) this was then used with the Digital Terrain Model (DST-Lidar) to provide an assessment of the percent coverage of water at or above 30cm within the water depth and duration map in Appendix 6. 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, despite the wetland having extensive and

prolonged extent, the depth marker was not recorded over 30cm after August 2021. During on-ground truthing throughout the wetland, depth exceeded 30cm across a large expanse of the wetland, although this is not seen in the depth post records. After running the mapping model to assist with water extent coverage a recommendation is to install more markers through a cross section of the wetland and capture more data to assist in ensuring the requited extent is met.

The sandbags which were placed to block the drain and reinstate the wetland, degraded faster than expected, allowing seepage to occur and eventually giving way sometime between the fortnightly inspections from the 6th of October to the 19th of October. Further details are in the Performance Target section of the report.

No foxes were recorded on the remote camera and the landholder has undertaken fox control through a shooting program, with 5 foxes in total being shot. This occurred away from the wetland in adjoining paddocks prior to the Brolga breeding season in July.

Reporting of native vegetation extent and percent coverage is not required until the second filling (as detailed in the BCP), however, based on our visual assessment we are confident that these targets will be met. Four permanent transects are to be surveyed annually in December each year in conjunction with the Wetland Decision Support Tool (DST.v1). This will assist in determining the success of this output. Current species seen include *Eleocharis*, *Ranunculus*, *Juncus* and *Triglochin*.

Photo 2. Sandbag block installed at drain December 2020 (north facing)

Photo 4. Pair of brolga's over wetland area (photo supplied buy landholder, July 2021)

Photo 3. Sandbag block in August 2021 (south facing)

Photo 5. Wetland vegetation in October 2021

Photo 6. DUN002 Wetland after the sandbag block was installed (September 2021)

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.

A new fence has been installed using plain wire to ensure stock access is controlled and allow vegetation to recover.

During site visits Greening Australia staff have observed a pair of Brolgas on numerous occasions including the 12th May, 9th July, 24th August, 21st September, 6th of October,16th and 30th of November. There were 5 Brolga's captured on remote camera on the 4th of October 2021 and single images of Brolga on the 7th and 9th November.

All the depth marker posts recorded water levels above 30cm (performance target is re-establishment of 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). Post 4 was placed in the deepest part with 35cm recorded on 13th July. The highest measurement was on the 9th August and 6th September at 64cm. The last measurement in November the water depth was sitting at 58cm in the deepest section, with the outer marker at 20cm.

Using the DST v1 method along with four permanent 120m transect lines, vegetation was assessed in December 2020 and again in December 2021. This information will assist with providing information on aquatic species and vegetation cover within the wetland. During wetland visits the vegetation is beginning to show signs of recovery with species of *Eleocharis*, *Juncus* and *Poa*.

Photo 7. Sandbags placed in drain

Photo 8. Sandbags starting to degrade (July 2021)

Photo 9. Soil bund material excavated from historical drain pushed back into drain over sandbags (August 2021)

Photo 10. Pair of Brolga in wetland taken through scope (August 2021)

Photo 11. Vegetation growth during Year 1.

Photo 12. Vegetation growth surrounding depth marker post

Photo 13. DUN003 Wetland after the sandbag block was installed (October 2021)

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 level in DUN003 in Year 1. The old fence surrounding the wetland which was ringlock has been taken down and a new single wire fence has been installed to restrict stock access. Vegetation was assessed in December 2020 and planned for December 2021 using the Decision Support Tool V1.0 (Roberts et al. 2017) and the four permanent 120m transect lines.

During fortnightly monitoring Greening Australia staff didn't see any Brolga's onsite but did capture what appear to be a pair of Brolga on the remote camera's (26th June 2021). There were numerous other bird species utilising the site, including Latham's Snipe (*Gallinago hardwickii*) in October and November, with 26 recorded on the 30th of November. There have been Black Swans (*Cygnus atratus*) nesting in the wetland.

All depth marker posts recorded 30cm and above recordings (performance target is re-establishment of 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) with Post 4 (deepest part of the wetland) recording approximately 90cm in depth. The latest recording for Post 4 in November prior to completion of the report was around 70cm.

No foxes were recorded on the remote camera and no visual sightings during times when the landholder has been onsite within the wetland.Reporting of native vegetation extent and percent coverage is not a requirement until the second filling, through on-ground assessment these targets are likely to be met. Four permanent transects are to be surveyed annually with another round of

monitoring due in December 2021, in conjunction with Wetland DST v1. This data will assist in determining the success of this output. Current species seen include *Eleocharis*, *Ranunculus*, *Juncus* and *Triglochin, Myriophyllum* and *Potamogeton*. A single *Craspedia variabilis* (Swamp Billy-button) plant was identified in the wetland.

Photo 14. Sandbags placed in drain 1 of wetland

Photo 15. Water level over sandbags within the drain (August 2021)

Photo 16. Vegetation growth in Drain 1 (October 2021)

Photo 17. (Left) *Craspedia paludicola* (Swamp Buttons)

Photo 18. (Below) Vegetation across the wetland (October 2021)

Photo 19. DUN004 Wetland after the sandbag block was installed (November 2021)

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.

As part of the hydrology actions, sandbags were placed within the drain to allow for water levels to return to original sill levels in DUN004 during Year 1. An old barbwire fence surrounding the wetland has been taken down and replaced with single wires to restrict stock access. The vegetation was initially assessed in December 2020 using the Wetland DST v1.0 (Roberts et al. 2017) along with setting up four permanent 120m transect lines to assist with vegetation cover assessments.

During the fortnightly monitoring Greening Australia staff didn't see any Brolga's onsite during the wetland monitoring but the fencing contractor and landowner both recorded seeing Brolga at the wetland when out on the property. Greening Australia staff did see a pair of Brolga's during initial assessment of the wetland and when undertaking the vegetation survey and setting the sandbag block in November 2020.

Water depth markers 2,3 & 4 have all recorded water depths above 30cm with Post 4 highest measurement approximately 48 cm (performance target is re-establishment of 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). From the 29th July until present, Post 4 has been above 30 cm. Post 2 and 3 were above 30 cm from the 9th of August, dropping to 30 cm on the 19th of October.

The current level for these posts are 28-29 cm from the 16th of November. Appendix 2 provides a full list of dates and measurements.

The remote camera captured 4 foxes in the wetland, with no fox program conducted on the property due to the landowners' contractor not being able to get out onsite due to restrictions with Covid 19. A program will be undertaken once the wetland has dried, after the Brolga breeding season.

Reporting of native vegetation extent and percent coverage is not a requirement until the second filling, through on-ground assessment these targets are likely to be met. Four permanent transects are to be surveyed annually with another round of monitoring due in December 2021, in conjunction with the Wetland DST v1. This data will assist in determining the success of this output. The wetland is divided in two vegetation communities with Eragrostis infecunda (Southern Cane Grass), being dominant in the wetter area and what appears to be more a Plains Grassy Wetland (EVC 125) with species *Utricularia beaugleholei*, Poa labillardierei, *Rytidosperma*, *Eleocharis, Potamogeton* and *Juncus* consistent with the EVC.

Photo 20. Sandbags placed in wetland (November 2020)

Photo 21. Wetland drain (September 2021)

Photo 22. Pair of Brolga spotted 9th December 2020

Photo 23. Remote camera capture of a Fox

Photo 24. *Eleocharis acuta* (Common Spike-sedge) (November 2021)

Photo 25. Utricularia beaugleholei (Fairies Aprons) (October 2021)

Measure	Method	Timing	Summary
		Year 1 and 2	
Brolga use of the wetland	Observations of the number and age of birds. Observations of evidence of breeding activity, including: - 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). If breeding activity is observed, then Breeding Activity Monitoring (as outlines below) will commence). Any Brolga breeding activity will be reported to DELWP to be added annually to the Victorian Biodiversity Atlas (VBA) database administered by DELWP.	Every two months, during breeding season.	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 Go. Full recorded list is provided in Appendix 5. Summary of Brolga sightings are: DUN-BCP-001 – 6 sightings by landholder of a pair of adult Brolgas feeding and foraging in wetland. No Greening Australia staff observations when out onsite. DUN-BCP-002 – 7 sightings by Greening Australia staff of a pair of adult Brolga feeding and foraging in the wetland. 4 images captured on remote camera of Brolga's. All appear to be adult. DUN-BCP-003 – No observations of Brolga onsite during Greening Australia's monitoring. 1 image captured on remote camera of a pair of Brolga's. DUN-BCP-004 – Observations of Brolga by Greening Australia staff in November 2020, no other sightings when onsite. Fencing contractor and landholder noted a pair of Brolga's frequented the wetland on numerous occasions through May and June 2021.
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	No breeding observed in Year 1.
Hatched chicks	Field-based observations of breeding success and survival of chicks.	Weekly until chick is fledged (approximately after 12 weeks).	

Section 2: Evaluation of each Wetland against Wetland Performance Targets

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-centimers 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.	While the mapping suggests the extent was under the expected inundation for DUN-BCP-001, DUN-BCP-002 and DUN-BCP-004, it doesn't reflect the on-ground truthing during monitoring. The depth and extent maps are modelled from the wetland extent GPS marks and extracted values from the Digital Terrain Model (DTM – Lidar) to create a mean estimate of water heights. NOTE that this is a model only and more data needs to be refined to ensure accuracy. Water loggers have been deployed at each wetland which will provide more data to assist accuracy in determining water depths and extent. Once the wetlands have dried (Jan-Feb) the water loggers will be collected and processed. DUN-BCP-001 – Depth markers are not assisting the model to display water extent and depth as ground-truthed. Markers to be moved and further points taken in Year 2 to assist with model. DUN-BCP-002 – From July 29th the water depth was at 30cm or more across 61-67% of the wetland basin (over 5ha of the wetland). While not reaching the 75% mark this may be due to the volume of water lost when replacing the degraded sandbags. DUN-BCP-003 – This site has exceeded the 75% target reaching 94% of the wetland basin at 30cm or above, with coverage in November at 86% DUN-BCP-004 – The water extent covered approximately 88% of the wetland basin in August. Of this 31% of the wetland was at or above 30cm, totalling to around 7ha of the wetland.	Review of each invert level (natural sill height) of all 4 wetlands have found that 3 wetlands need to install more robust blocks to provide better retention of water. Hessian sandbags degraded quickly in DUN-BCP-001 and gave way. Recommendation is to install a combination of at least 60-70% geofabric sandbags with existing onsite soil (pile from historical drain and dam excavation) to form a robust temporary block in the drain. Consultation with DELWP prior to any works will be undertaken. DUN-BCP-001 – Depth post markers moved to provide a better coverage of wetland. DUN-BCP-004 – Cap hessian sandbags to reduce further degradation.

Table 3: Wetland Performance Targets Summary

The BCP outlines Wetland Performance Target for Year 1, these are provided below in Table 3 as well as a summary of findings, progress and recommendations.

NOTE: Water extent and depth monitoring will continue until the wetland has dried out as required in the BCP, at the time of reporting all wetlands except DUN-BCP-001 were still retaining water.

Table 3 Continued: Wetland Performance Targets Summary

Vegetation	Extent and percentage cover of suitable aquatic vegetation (i.e. rushes and sedges).	a) 80% or greater aquatic vegetation cover over 40% of the wetland basin within two fillings. b) 80% of greater aquatic vegetation cover over 60% of the wetland within four fillings. c) No decline in the extent and cover od aquatic vegetation after the fourth filling.	a) At the end of the **second wetland filling** b) At the end of the fourth wetland filling c) Ongoing	Not applicable for Year 1. Survey transect lines were set up in December 2020 to gather baseline information, vegetation data will be collated again in December 2021 to assist with Year 2 reporting to meet performance targets. Initial on-ground observations from Year 1 is encouraging with aquatic vegetation responding well to new inundation levels. We are confident that all 4 sites will meet the cover requirements	Not applicable at this stage to develop any wetland replanting plans.
	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. All wetlands met the requirements set out in the Vegetation DST assessment conducted in December 2020 to meet habitat and EVC objectives particular to each individual wetland.	Review DST assessment and adjust relevant wetland management parameters to ensure effective habitat rehabilitation. This is scheduled after Year 2 vegetation assessment.
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. Investigate possible disturbance / predator behaviour that may be deterring birds. Remote camera's and landholder observations have recorded foxes in wetlands DUN-BCP-001 and DUN-BCP-004. Fox control was undertaken in DUN-BCP-001 in adjoining paddocks outside of Brolga breeding season. No other control has occurred on the other 3 wetlands. A program will undertaken in conjunction with landholder on DUN-BCP-004 where the foxes were recorded, outside of the Brolga breeding season in 2022.)
Nesting behaviour	Brolga pair building nest and laying eggs	Nest present, eggs laid	See above	While Brolga's were present at each wetland, at all times observed they were feeding and didn't appear to be looking to build a nest.	Provision of supplementary nest material if required (e.g. hay). Not applicable at this stage. Investigate possible disturbance / predator behaviour deterring birds (recommendations are the same as above for predator control).
Wetland Restoration and Management					
Fledged young	Number of young	Young successfully fledged at the	N/A	N/A	Recommendations not appliable at this stage.

	successfully fledged.	average rate of about one every second year across each wetlands in the plan from year four.			Investigate and control any predators of eggs and young birds. Refine water regime management to ensure appropriate conditions long enough to produce fledglings.

Section 3: Recommendations on the implementation of contingency measures

Contingency measures have been assessed and determined below based on on-ground assessments and monitoring data. While the mapping suggests the extent was under the expected inundation for DUN-BCP-001, DUN-BCP-002 and DUN-BCP-004, it doesn't reflect the on-ground truthing during monitoring. Please note that this is a model only to gather assessment on the 75% depth extent target across the wetland basins, more data needs to be collected to ensure accuracy. Water loggers have been deployed at each wetland which will further assist in determining water depths and extent. Once the wetlands have dried (Jan-Feb) the water loggers will be collected and processed.

DUN-BCP-001

- Re-install depth markers across the wetland to better represent the wetland basin topography. Increase data on wetland depth by sampling more of the wetland outside of the depth maker locations.
- Install a combination of at least 60-70% geofabric sandbags in combination with the use of existing onsite soil (pile from historical drain and dam excavation) to form a robust and temporary block in the drain. Consultation with DELWP prior to commencement of works

DUN-BCP-002

- Continue to monitor outlet drain block and adjust as required.

DUN-BCP-003

- No adjustments required, continue monitoring.

DUN-BCP-004

- Cap sandbags to reduce hessian degradation in the drain.

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 website[2].

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 is the wetland plan is suitable to restore based on the intended long-term goal.

All four wetlands meet the requirements set out in the Vegetation DST assessment conducted in December 2020 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. 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 sepcies, 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).

On monitoring, the ground cover vegetation exceeded bare areas, with a medium to short height of plant cover across the wetland with a mix of vegetation types (graminoid habit and low lying herbs).There are no trees within the wetland or on the wetland verge. There was evidence of animal droppings within the wetland but these were sparse. The wetland has been used for

[2] 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

grazing of stock with evidence of some pugmarks. There are the likely 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 it is highly likely that indicator species for EVC 125 will establish through the seed bank once grazing pressure has been controlled. The DST indicates that the wetland recovery plan with specific interventions may prove successful.

BCP-DUN002 (Cross Roads)

Plan Worksheet

As written in the 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 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).

There was very little to no groundcover in the wetland with a mix of grasses and rushes all very short, below 5cm in height. The *Poa* were the tallest vegetation occurring on the south-western perimeter of the wetland. There are no trees within the wetland or on the wetland verge. The wetland has been used for grazing of stock with clear evidence of animal droppings and pugmarks, at the time the wetland was not fenced. Not seen on the day is likely to be the presence of waterfowl and swans in neighbouring wetlands and drainage systems, 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 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. 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 that the wetland recovery plan with specific interventions may prove successful.

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 Brolga Compensation Plan (BCP). The target and current EVC for the wetland is mapped within DELWP NatureKit as EVC 691 Aquatic Herbland / Plains Sedgy Wetland Mosaic. The planned hydrology works include blocking two artificial outlet drains to increase the extent and holding capacity of the wetland. Other management activities include fencing to manage stock access and weed control. 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 7 species consistent with EVC 691, these include Potamogeton tricarinathus s.l. (Floating Pondweed) *Amphibromus species* (Swamp Wallaby-grass), Rytidosperma duttonianum (Brown-back Wallaby-grass), *Eleocharis acuta* (Common Spike-sedge) and *Lobelia pratioides* (Poison Lobelia).

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 evidence of animal droppings and limited pugmarks seen, at the time the wetland was fenced although the gates were ineffective and not in good repair. Although not seen on the day the wetland likely 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 wetlands also contain a large area of Poa labillardierei which extends outside the wetland fenced boundary in 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 during the vegetation survey it is likely that the indicator species for EVC 691 will establish through the seed bank once grazing pressure has been controlled. The DST indicates that the wetland recovery plan with specific interventions may prove successful.

BCP-DUN004 (Westmere)

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 Brolga Compensation Plan (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 possibly EVC 125 Plains Grassy Wetland on the outer northern areas (further vegetation assessment needs to occur once more vegetation has grown back). For this assessment EVC 291 was used, this will be reassessed after year 2 as planned in the BCP. The planned hydrology works include blocking an artificial outlet to increase the extent and holding capacity of the wetland. Other management activities include replacing fencing to manage stock access and weed control. 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 in December 2020 found 1 species out of 5 for the EVC abundant in the wetland, this being *Eragrostis infecunda* (Southern Cane-grass). This specie 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 very sparse Juncus species possibly *Juncus flavidus* (Gold Rush).

The groundcover was vigorous and abundant in the wetland with a monospecific stand of Cane Grass. The height of the Cane Grass was medium with areas outside of its extent very short (<5cm). There are a few sporadic plantings of native trees around the perimeter of the wetland with some remnant Eucalyptus *camaldulensis* on the outer western verge of the wetland. The wetland has been used for grazing of stock with some evidence of animal droppings and limited pugmarks seen, at the time the wetland was fenced with some areas needing repair. Although not seen on the day the wetland likely supports the presence of waterfowl and swans, 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 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 through desktop and onsite during the vegetation survey it is likely that the indicator species for EVC 291 will establish through the seed bank once grazing pressure has been controlled. A better indication of other EVCs present will occur after grazing management has occurred and the vegetation can re-establish. The DST indicates that the wetland recovery plan with specific interventions may prove 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	10/12/2020				✓
	14/07/2021	✓	✓	✓	
	26/07/2021	✓	✓		
	09/08/2021	✓	✓		
	24/08/2021	✓	✓	✓	
	07/09/2021	✓	✓		
	23/09/2021	✓	✓		
	06/10/2021	✓	✓		
	19/10/2021	✓	✓	✓	
	03/11/2021	✓	✓		
	16/11/2021	✓	✓		
	30/11/2021	✓	✓	✓	
	07/12/2021				✓

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	30/11/2020				✓
	14/07/2021	✓	✓	✓	
	26/07/2021	✓	✓		
	09/08/2021	✓	✓		
	24/08/2021	✓	✓	✓	
	07/09/2021	✓	✓		
	23/09/2021	✓	✓		
	06/10/2021	✓	✓		
	19/10/2021	✓	✓	✓	
	03/11/2021	✓	✓		
	16/11/2021	✓	✓		
	30/11/2021	✓	✓	✓	
	21/12/2021				Scheduled to complete

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	18/11/2020				✓
	14/07/2021	✓	✓	✓	
	26/07/2021	✓	✓		
	09/08/2021	✓	✓		
	24/08/2021	✓	✓	✓	
	07/09/2021	✓	✓		
	23/09/2021	✓	✓		
	06/10/2021	✓	✓		
	19/10/2021	✓	✓	✓	
	03/11/2021	✓	✓		
	16/11/2021	✓	✓		
	30/11/2021	✓	✓	✓	
	21/12/2021				Scheduled to complete

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	08/12/2020				✓
	14/07/2021	✓	✓	✓	
	26/07/2021	✓	✓		
	09/08/2021	✓	✓		
	24/08/2021	✓	✓	✓	
	07/09/2021	✓	✓		
	23/09/2021	✓	✓		
	06/10/2021	✓	✓		
	19/10/2021	✓	✓	✓	
	03/11/2021	✓	✓		
	16/11/2021	✓	✓		
	30/11/2021	✓	✓	✓	
	14/12/2021				Scheduled to complete

Appendix 3. 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	16/05/2021	2	Adult	No	Feeding in wetland, recorded by landholder
	17/05/2021	2	Adult	No	Feeding in wetland, recorded by landholder
	18/05/2021	2	Adult	No	Feeding in wetland, recorded by landholder
	24/07/2021	2	Adult	No	Recorded by landholder in wetland
	25/07/2021	2	Adult	No	Recorded by landholder in wetland
	19/09/2021	2	Adult	No	Recorded by landholder in wetland

DUN-BCP-002 Cross Roads Brolga Sighting Records

Wetland ID	Date	Brolga Sightings			
		Number	Age	Breeding	Comments
DUN-BCP-002	12/05/2021	2	Adult	No	Greening Australia staff visual observation
	09/07/2021	2	Adult	No	Greening Australia staff visual observation
	24/08/2021	2	Adult	No	Greening Australia staff visual observation
	21/09/2021	2	Adult	No	Greening Australia staff visual observation
	04/10/2021	5	Adult	No	Captured on remote camera
	06/10/2021	2	Adult	No	Greening Australia staff visual observation
	07/11/2021	1	Adult	No	Captured on remote camera
	09/11/2021	1	Adult	No	Captured on remote camera
	16/11/2021	2	Adult	Possible	Greening Australia staff visual observation, vegetation obscuring view and hard to determine if they have built a nest.
	30/11/2021	2	Adult	Possible	Greening Australia staff visual observation. Appear to be the same pair within the wetland, vegetation obscuring view and cannot determine if they have a nest. Continue to monitor on a fortnightly basis.

DUN-BCP-003 Woorndoo Brolga Sighting Records

Wetland ID	Date	Brolga Sightings			
		Number	Age	Breeding	Comments
DUN-BCP-003	26/07/2021	2	Adult	No	Captured on remote camera

DUN-BCP-004 Westmere Brolga Sighting Records

Wetland ID	Date	Brolga Sightings			
		Number	Age	Breeding	Comments
DUN-BCP-004	23/11/2020	2	Adult	No	Greening Australia staff visual observation of pair in wetland
	May 2021	2	Adult	No	Landholder and contractor noted a pair of Brolga's visiting the wetland. Dates unknown.
	June 2021	2	Adult	No	Landholder and contractor noted a pair of Brolga's visiting the wetland. Dates unknown.

Appendix 4. 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	14/07/2021	5	30	1	1
	26/07/2021	5	40	16	6
	09/08/2021	12	50	22	12
	24/08/2021	10	48	21	10
	07/09/2021	11	47	21	10
	23/09/2021	2	38	13	1
	06/10/2021	0	32	7	0
	19/10/2021	1	28	8	0
	03/11/2021	0	31	9	0
	16/11/2021	0	27	5	5
	30/11/2021	0	20	0	0

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	13/07/2021	0	20	18	35
	26/07/2021	20	40	40	60
	09/08/2021	20	48	42	64
	24/08/2021	18	44	40	61
	06/09/2021	20	46	42	64
	21/09/2021	16	40	36	58
	06/10/2021	16	40	36	58
	19/10/2021	20	40	36	58
	03/11/2021	12	32	34	52
	16/11/2021	16	35	38	56
	30/11/2021	10	33	35	52

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	13/07/2021	5	20	30	60
	26/07/2021	28	46	52	80
	09/08/2021	35	54	`60	`90
	24/08/2021	30	50	`60	`90
	07/09/2021	29	50	`60	`90
	23/09/2021	22	43	`50	`80
	06/10/2021	20	41	`50	`80
	19/10/2021	18	37	48	`76
	03/11/2021	15	35	46	'74
	16/11/2021	13	32	43	71
	30/11/2021	8	26	37	65

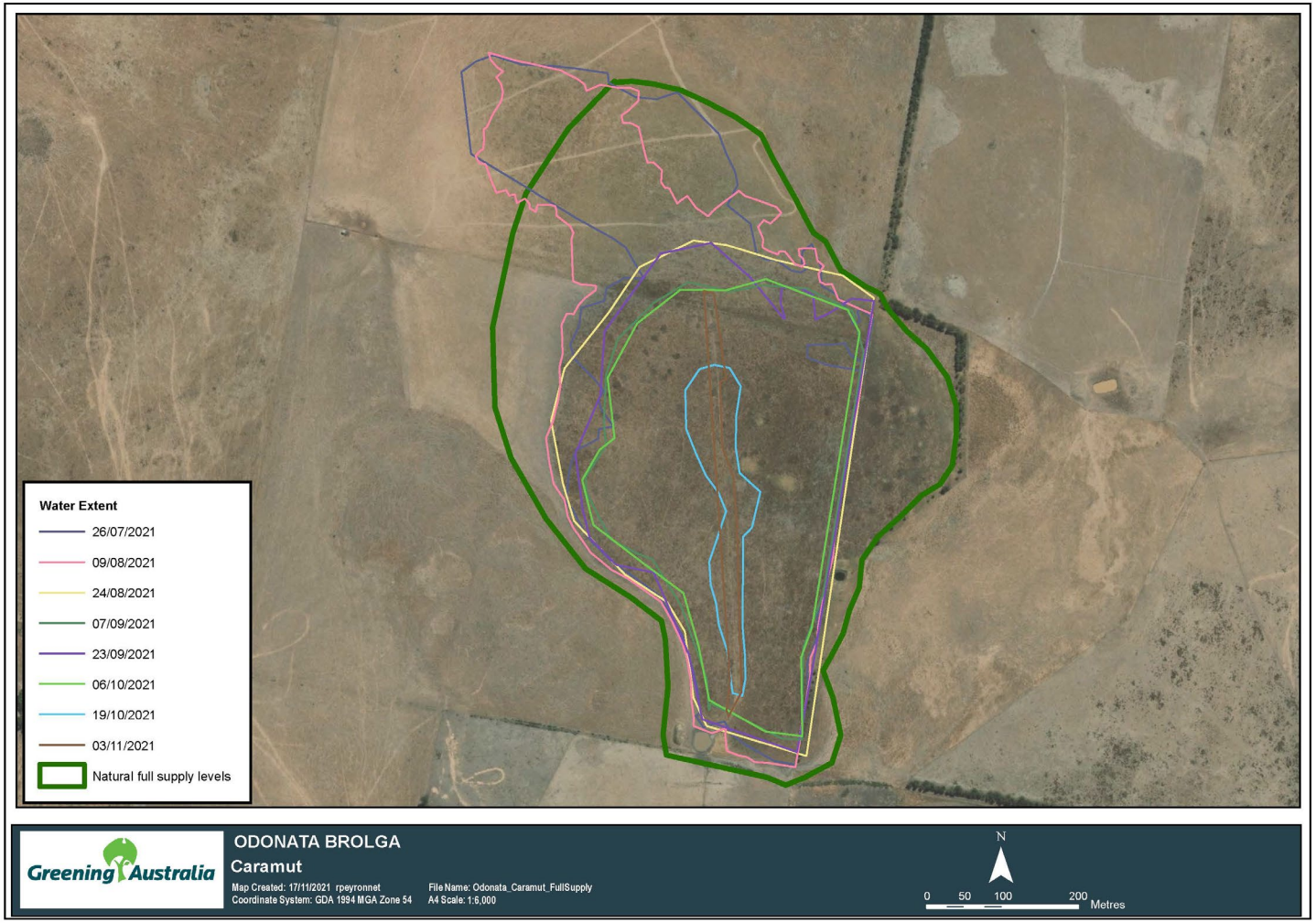
DUN-BCP-004 Westmere Water Depth Post Fortnightly Measurements (cm)

Wetland ID	Date	Marker Post Depth (cm)			
		1 (shore)	2	3	4 (deepest)
DUN-BCP-004	14/07/2021	2	18	18	28
	29/07/2021	10	24	24	34
	09/08/2021	18	33	33	43
	24/08/2021	19	34	34	45
	06/09/2021	20	36	36	48
	21/09/2021	20	36	36	48
	06/10/2021	18	32	32	40
	19/10/2021	17	30	30	38
	03/11/2021	14	29	29	36
	16/11/2021	12	28	28	35
	30/11/2021	8	20	20	30

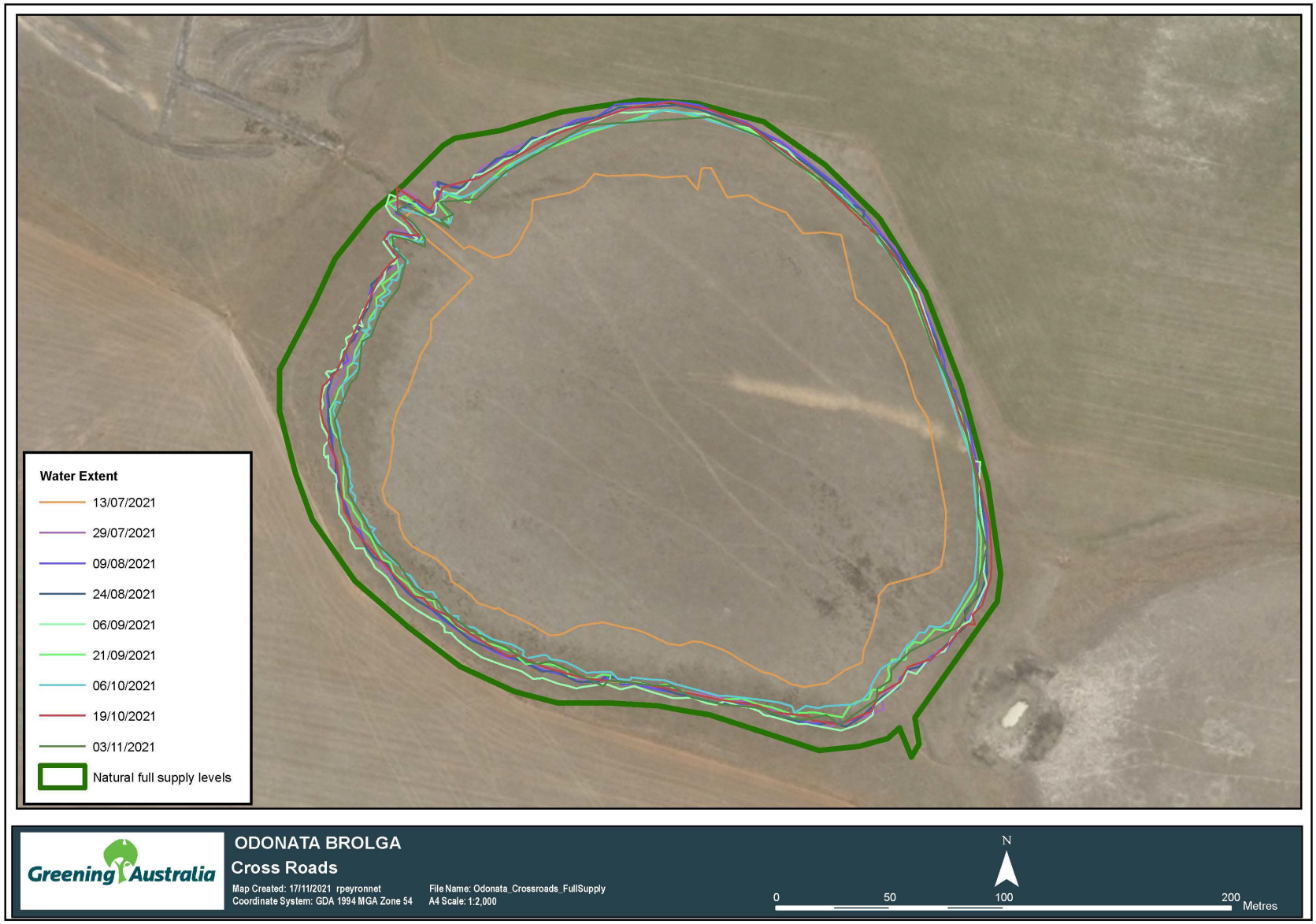
Appendix 5. Wetland Extent Mapping

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.

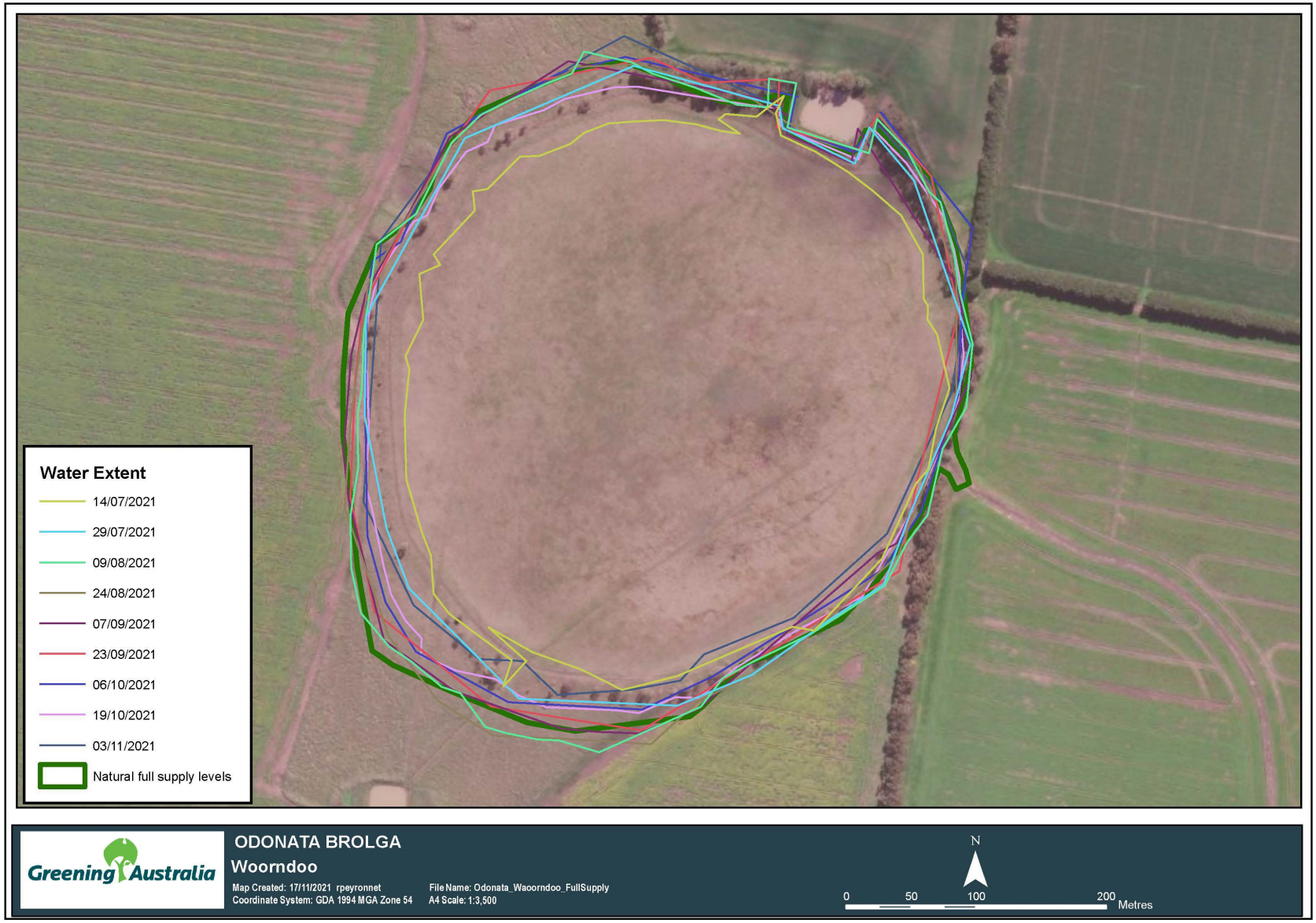
DUN-BCP-001 Caramut



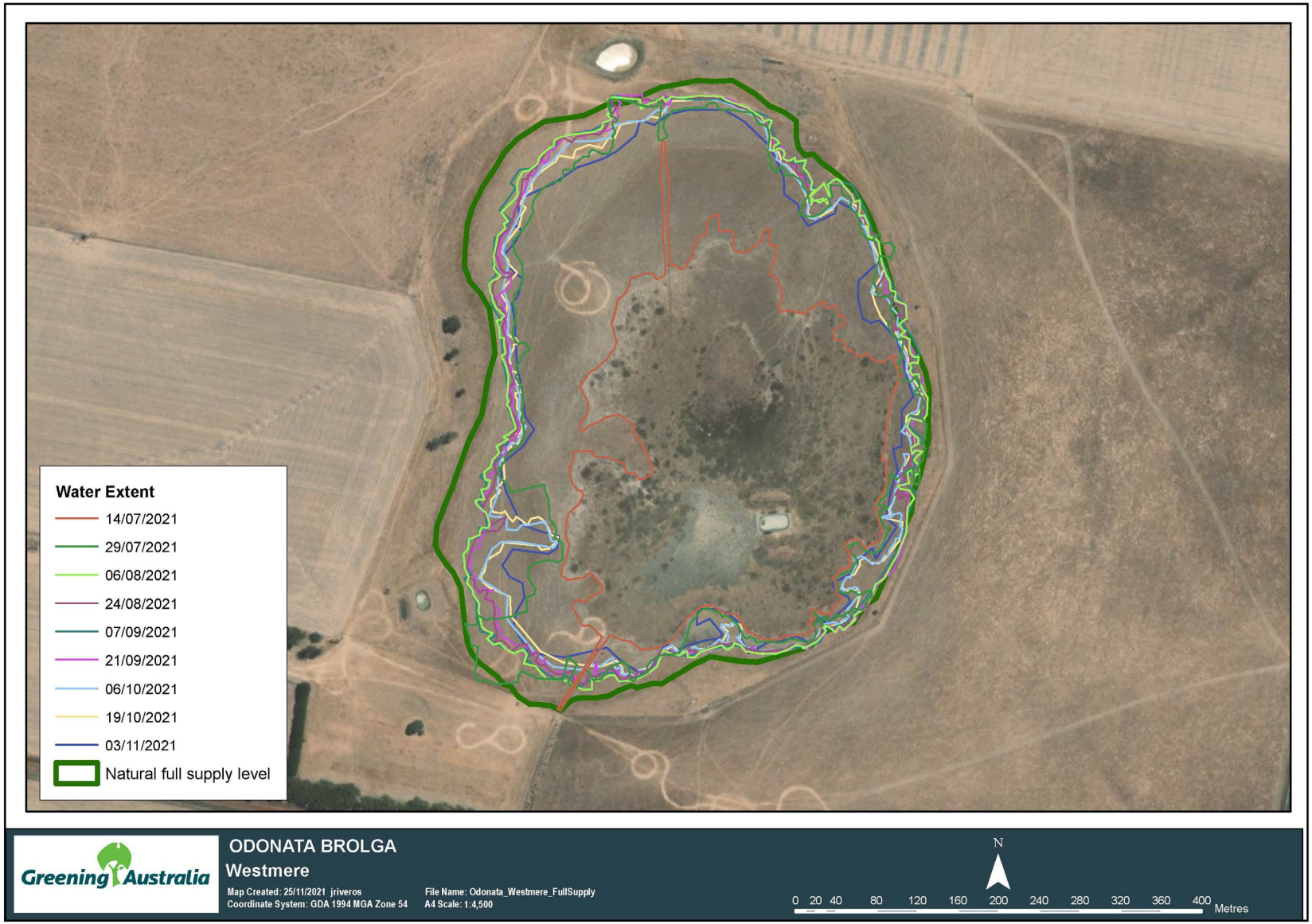
DUN-BCP-002 – Cross Roads



DUN-BCP-003 - Woorndoo



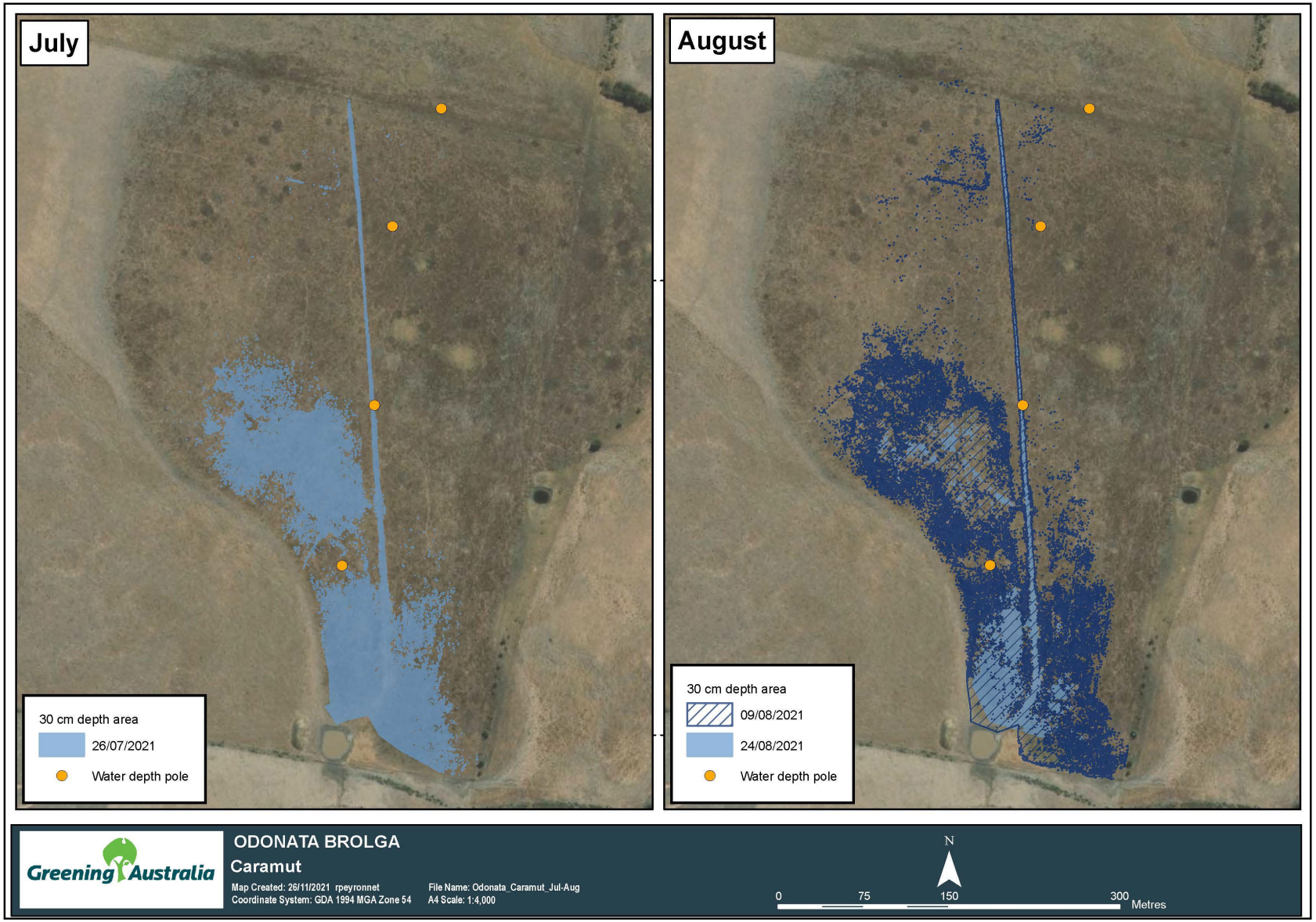
DUN-BCP-004 - Westmere

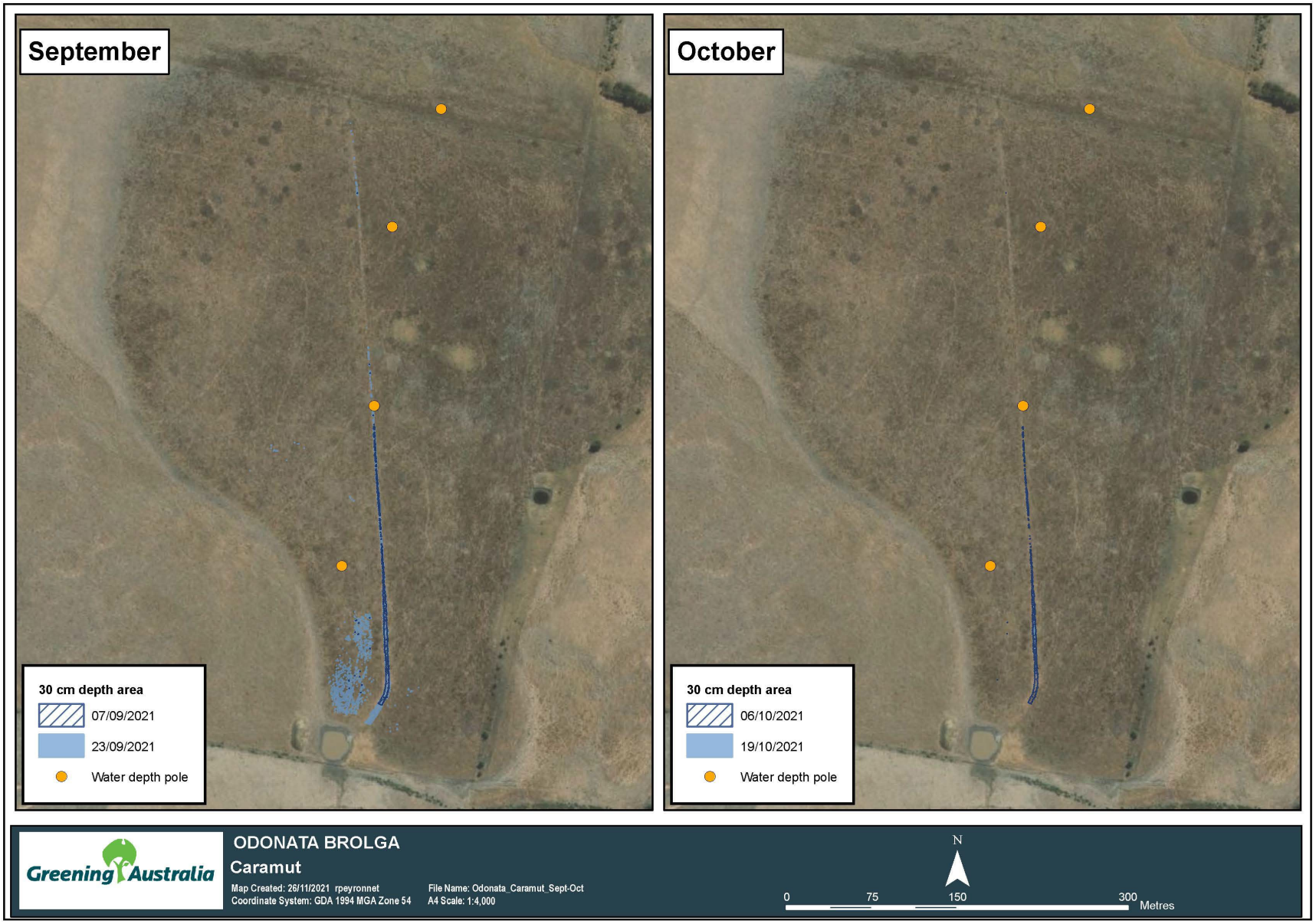


Appendix 6. Water Depth and Duration Maps

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).

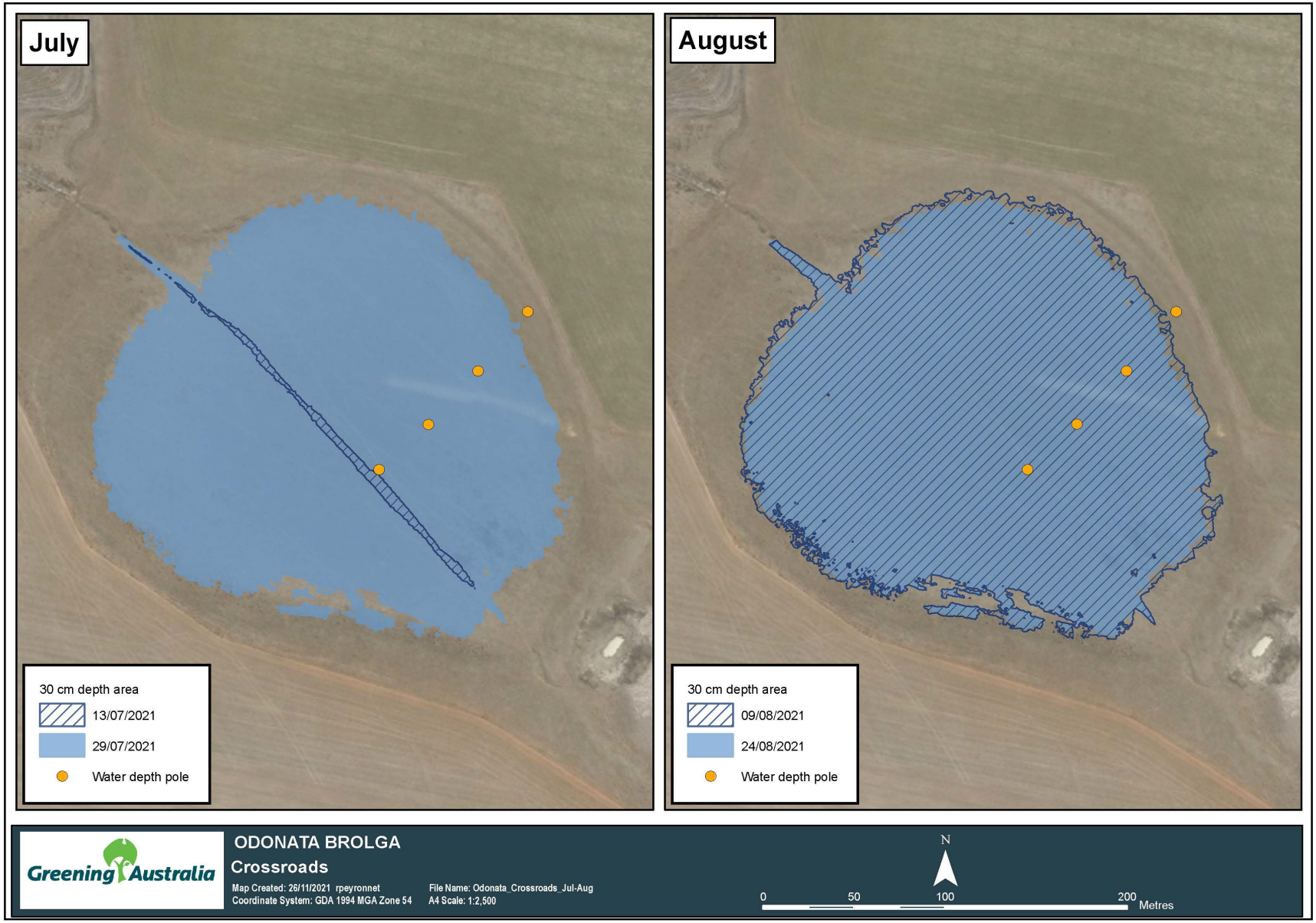
DUN-BCP-001 Caramut

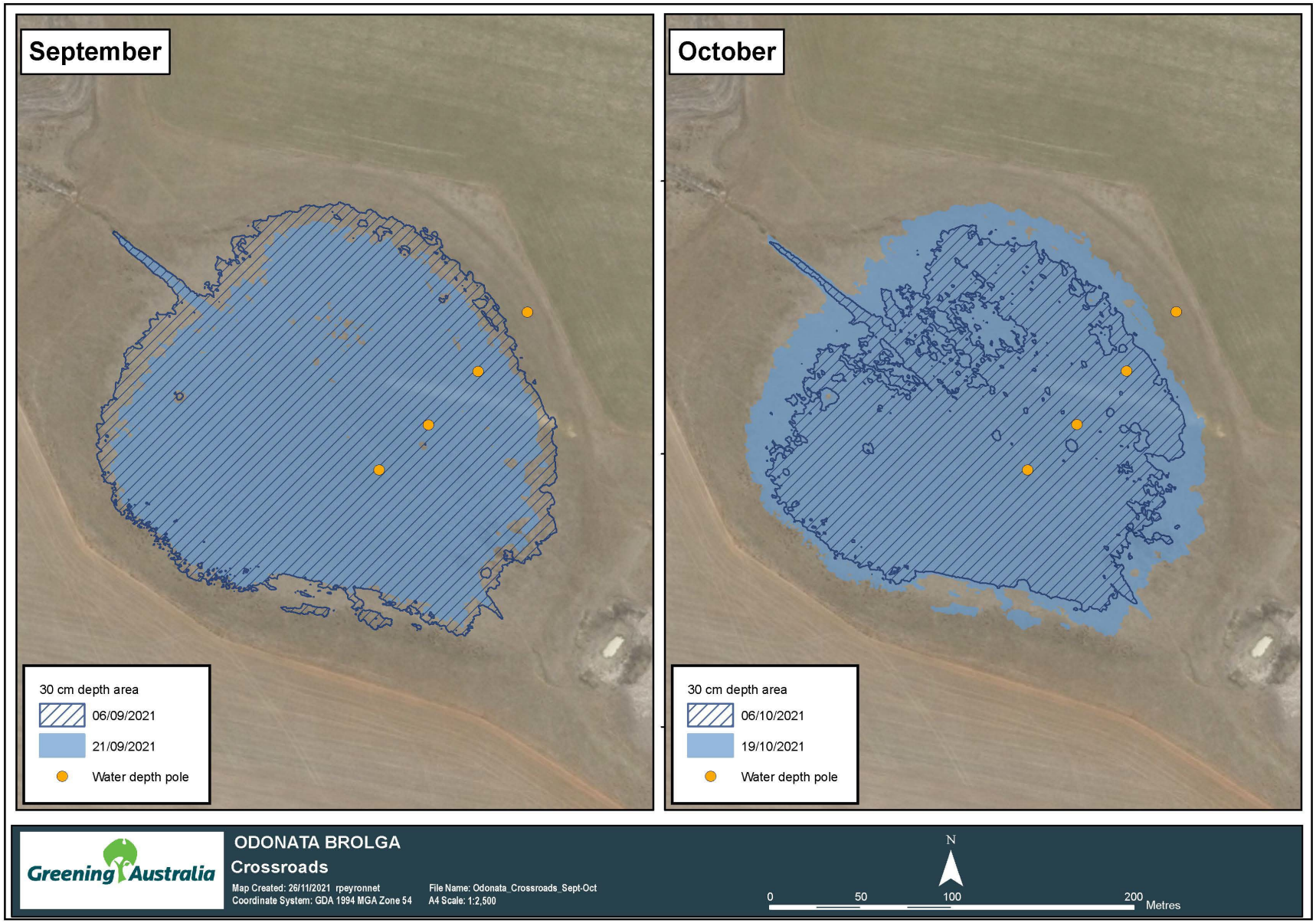


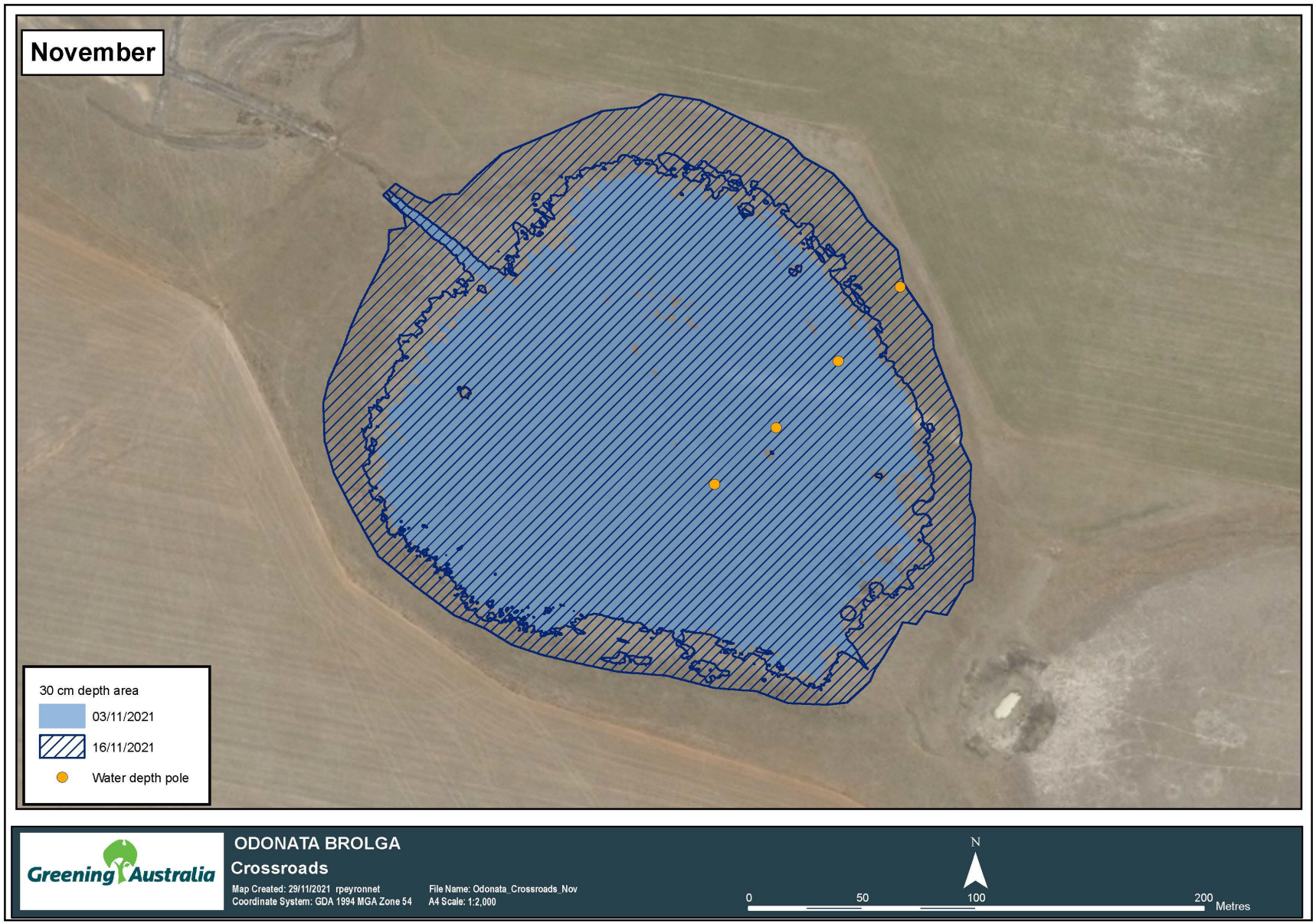

September
30 cm depth area
07/09/2021
23/09/2021
Water depth pole
October
30 cm depth area
06/10/2021
19/10/2021
Water depth pole
Greening Australia
ODONATA BROLGA
Caramut
Map Created: 26/11/2021 rpeyronnet
Coordinate System: GDA 1994 MGA Zone 54
File Name: Odonata_Caramut_Sept-Oct
A4 Scale: 1:4,000
N
0
75
150
300
Metres


November
30 cm depth area
03/11/2021
Points
Greening Australia
ODONATA BROLGA
Caramut
Map Created: 26/11/2021 rpeyronnet
Coordinate System: GDA 1994 MGA Zone 54
File Name: Odonata_Caramut_Nov
A4 Scale: 1:4,000
N
0
50
100
200
Metres

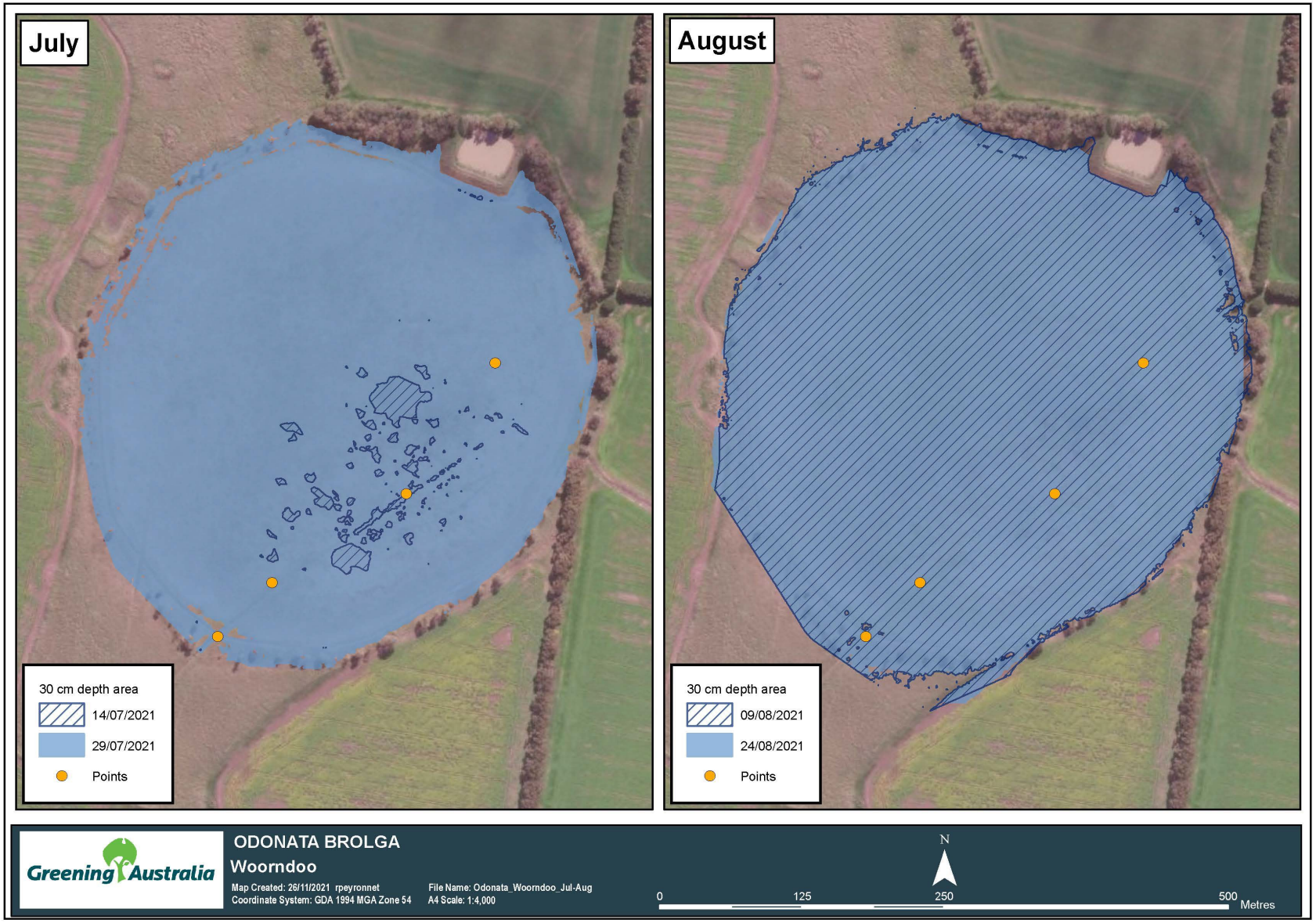
DUN-BCP-002 Cross Roads

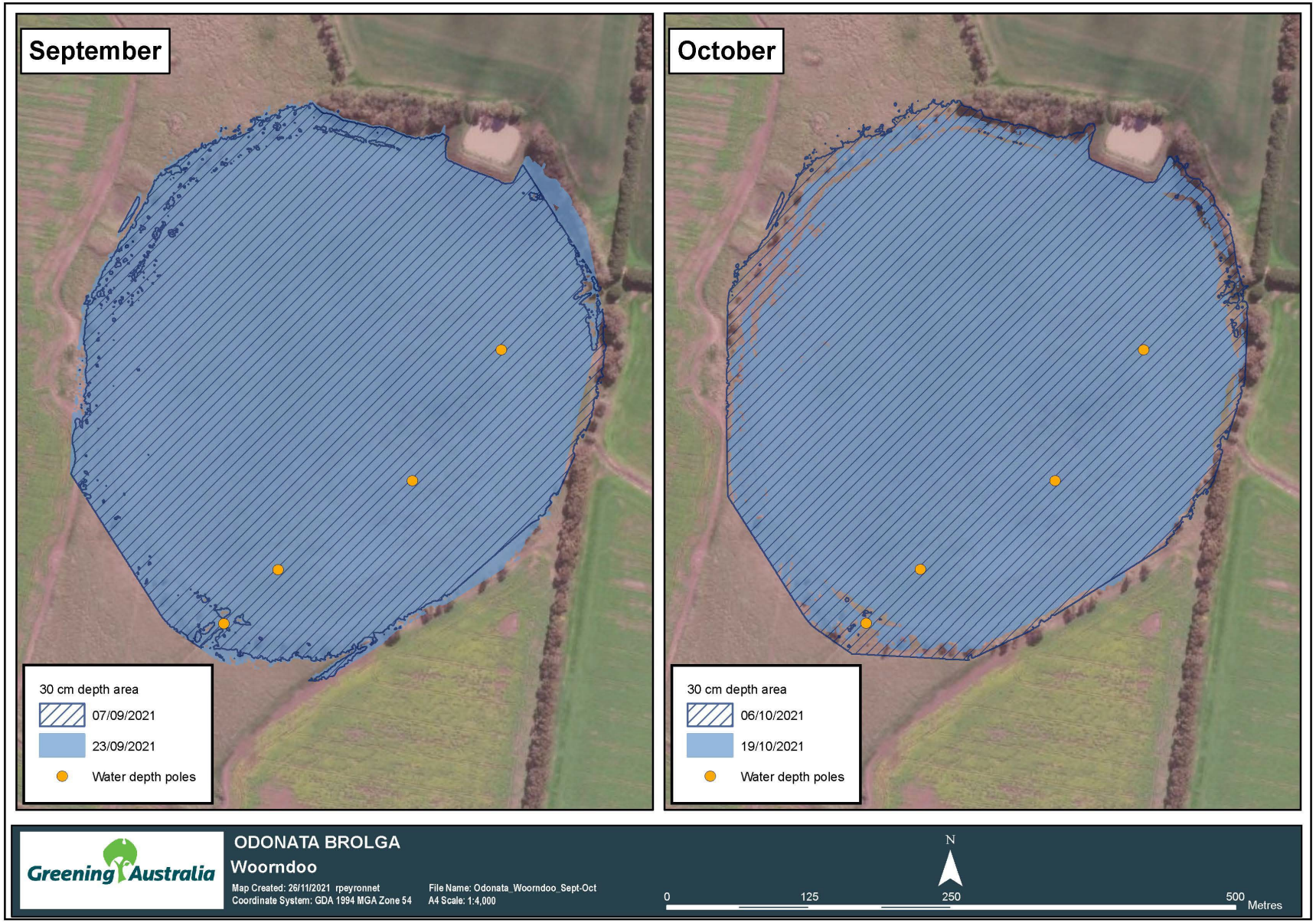


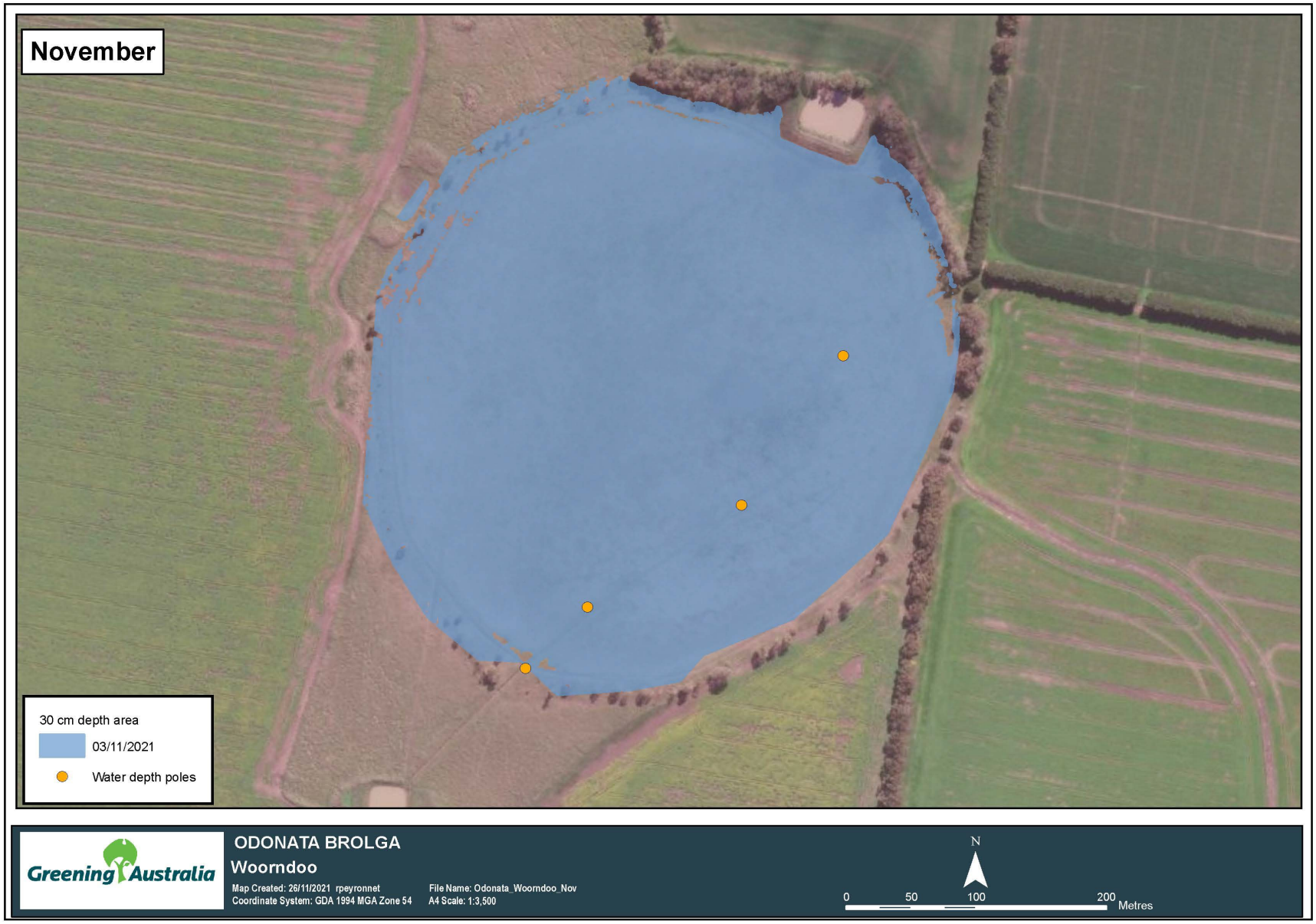

September
October
30 cm depth area
06/09/2021
21/09/2021
Water depth pole
30 cm depth area
06/10/2021
19/10/2021
Water depth pole
ODONATA BROLGA
Crossroads
Map Created: 26/11/2021 rpeyronnet
Coordinate System: GDA 1994 MGA Zone 54
File Name: Odonata_Crossroads_Sept-Oct
A4 Scale: 1:2,500
N
0
50
100
200
Metres


November
30 cm depth area
03/11/2021
16/11/2021
Water depth pole
ODONATA BROLGA
Crossroads
Map Created: 29/11/2021 rpeyronnet
Coordinate System: GDA 1994 MGA Zone 54
File Name: Odonata_Crossroads_Nov
A4 Scale: 1:2,000
N
0
50
100
200
Metres

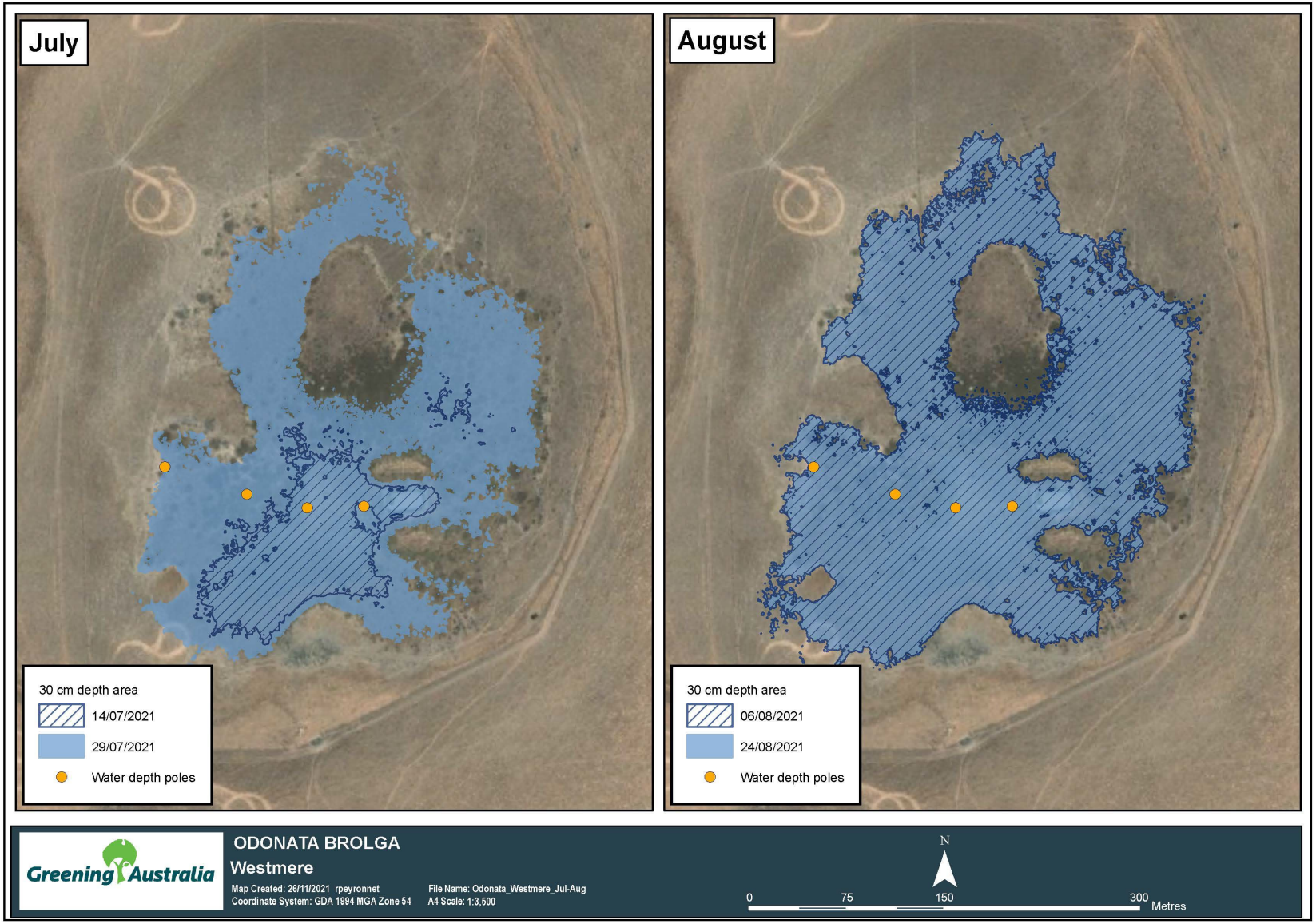
DUN-BCP-003 Woorndoo

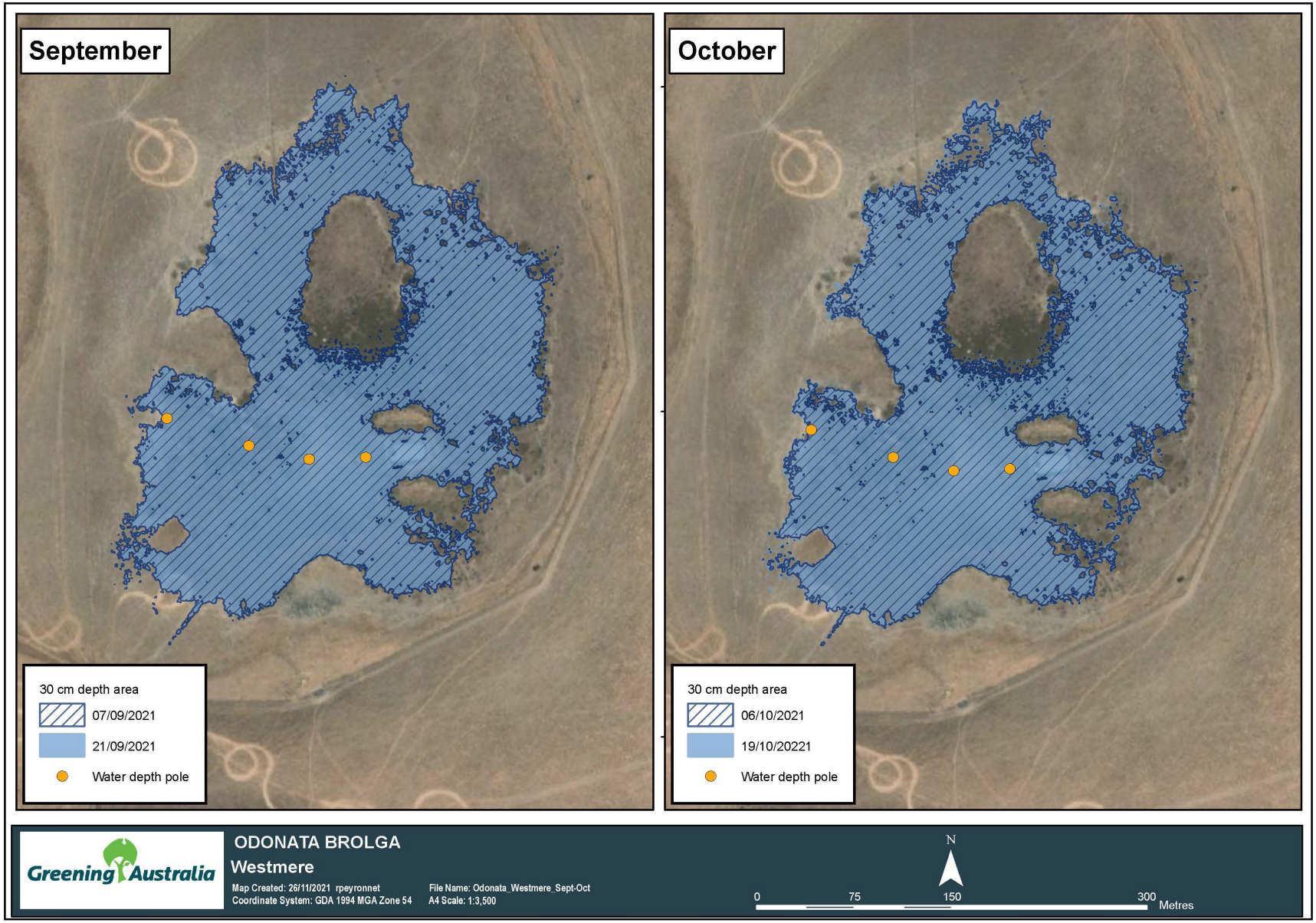



September
October
30 cm depth area
07/09/2021
23/09/2021
Water depth poles
30 cm depth area
06/10/2021
19/10/2021
Water depth poles
Greening Australia
ODONATA BROLGA
Woorndoo
Map Created: 26/11/2021 rpeyronnet
Coordinate System: GDA 1994 MGA Zone 54
File Name: Odonata_Woorndoo_Sept-Oct
A4 Scale: 1:4,000
N
0
125
250
500
Metres


November
30 cm depth area
03/11/2021
Water depth poles
ODONATA BROLGA
Woorndoo
Map Created: 26/11/2021 rpeyronnet
Coordinate System: GDA 1994 MGA Zone 54
File Name: Odonata_Woorndoo_Nov
A4 Scale: 1:3,500
N
0
50
100
200
Metres

DUN-BCP-004 Westmere




September
October
30 cm depth area
07/09/2021
21/09/2021
Water depth pole
30 cm depth area
06/10/2021
19/10/20221
Water depth pole
Greening Australia
ODONATA BROLGA
Westmere
Map Created: 26/11/2021 rpeyronnet
Coordinate System: GDA 1994 MGA Zone 54
File Name: Odonata_Westmere_Sept-Oct
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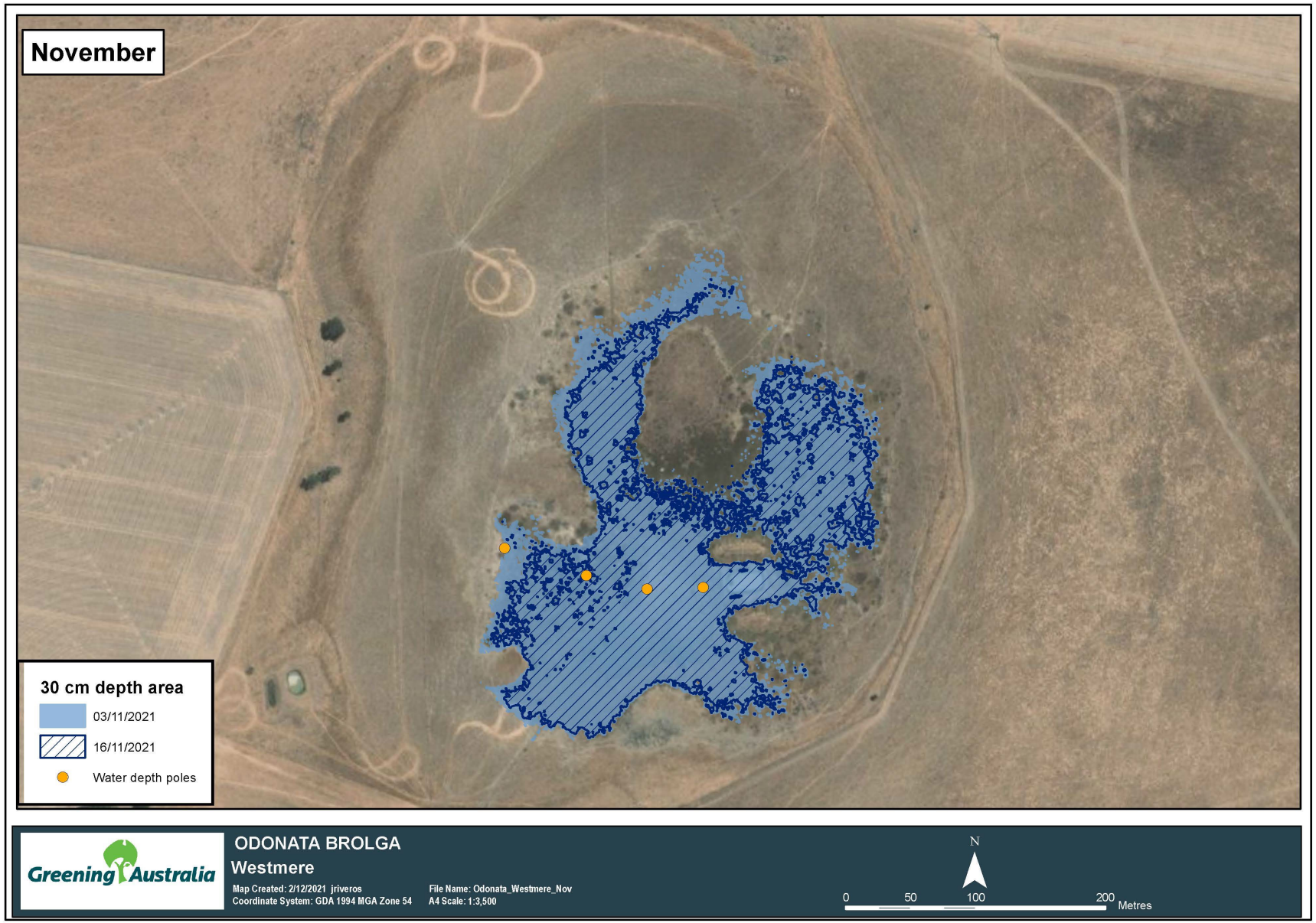
N
0
75
150
300
Metres


November
30 cm depth area
03/11/2021
16/11/2021
Water depth poles
ODONATA BROLGA
Westmere
Map Created: 2/12/2021 jriveros
Coordinate System: GDA 1994 MGA Zone 54
File Name: Odonata_Westmere_Nov
A4 Scale: 1:3,500
N
0
50
100
200
Metres