HUNTER VALLEY
OPERATIONS

EPBC 2016-7640
Annual Compliance Report

1 November 2019 to 31 December 2020

Date of Submission: 31 January 2021

Declaration of accuracy

In making this declaration, I am aware that sections 490 and 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) make it an offence in certain circumstances to knowingly provide false or misleading information or documents. The offence is punishable on conviction by imprisonment or a fine, or both. I declare that all the information and documentation supporting this compliance report is true and correct in every particular. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed 

Full name (please print) Michael Lloyd

Position (please print) Environmental & Community Coordinator

Organisation (please print including ABN/ACN if applicable)

HV Operations Pty Limited (ABN 76 606 478 399)

Date 31 January 2021

Cover Photos: Caladenia species at Mitchelhill West and Crescent Head South.

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1 Introduction

Hunter Valley Operations (HVO) became a jointly controlled operation between Glencore (49%) and Yancoal (51%) on the 1 September 2017. HVO operates under the Commonwealth approval, EPBC 2016/7640.

This annual compliance report has been prepared in accordance with the Annual Compliance Report Guidelines (Commonwealth of Australia 2014) and addresses compliance with the conditions of the EPBC 2016/7640 approval. The period covered is normally from 1st November to 31st October, but for ease of future reporting, HVO will transition the reporting year to the calendar year. As a result, this report covers the period 1 November 2019 to 31 December 2020 (the reporting period).

1.1 Background

Hunter Valley Operations is located at Lemington, approximately 24 kilometres northwest of Singleton in the Hunter Valley, NSW. The Commonwealth Minister for the Environment, under provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), issued approval EPBC 2016/7640 for the continuation of open cut coal mining operations, within the HVO mine complex, in areas that were previously approved by the State after the commencement of the EPBC Act 1999. Approval was granted on 10 October 2016 and the action commenced on 1 November 2016.

The EPBC 2016/7640 approval (last modified in August 2017), requires various offsets to be established as a result of the impacts upon Matters of National Environmental Significance (MNES). The offsets have been required to offset the following protected matters:

- Central Hunter Valley Eucalypt Forest (CHVEF) - **61ha**;
- Swift Parrot (*Lathamus discolor*) foraging habitat – **68.1ha**;
- Regent Honeyeater (*Anthochaera phrygia*) breeding and foraging habitat – **68.4ha**; and
- Green and Golden Bell Frog (*Litoria aurea*) breeding (**2.6ha**) and foraging habitat (**102.7ha**).

The Offset Strategy (Biodiversity Offset Strategy – State Approved Mining (EPBC2016/7640)), approved by the Minister on the 23 October 2017, details the offset areas that are to be secured and managed in relation to this approval. The offset areas are summarised below as the:

- **Wandewoi Biodiversity Area (BA)** – To offset approximately 63% of the action's impacts on Central Hunter Valley Eucalypt Forest (CHVEF) and 100% of the action's impacts on the Swift Parrot.
- **Mitchelhill BA** - To offset the residual 37% of the action's impacts on CHVEF and 53.9% of the Regent Honeyeater impacts.
- **Condon View BA** - To offset the remaining 46.1% of the Regent Honeyeater impacts.
- **Crescent Head BA** - To offset 99.25% of the action's impacts on the Green and Golden Bell Frog. The residual 0.75% offset for the Green and Golden Bell Frog is being provided through other compensatory measures. HVO is contributing the residual funds towards a GGBF Habitat Mapping project at Crescent Head which is managed by the Biodiversity & Conservation Division of the NSW Department of Planning, Infrastructure and Environment.

In accordance with the approval, the Mitchelhill BA, Condon View BA and the Crescent Head BA offset sites are to be secured in perpetuity, with legally binding agreements in place by 23 October 2018. Additionally, the Wandewoi BA is required to be secured in perpetuity by 10 October 2019.

An approval variation request was submitted to the former Department of the Environment and Energy (DoEE) (now Department of Agriculture, Water and the Environment, DAWE) on 27 September 2018 to extend the date by which the offsets had to be secured due to the ongoing dialogue with the various State and Commonwealth agencies. DoEE officers were in agreement with the request, however, given that HVO was also discussing the proposal to substitute a component of the Wandewoi BA for the Hook property, the DoEE asked that the variation be resubmitted to include all matters being discussed.

The second variation request was submitted on 18 October 2018 and had not been determined by the Delegate during the reporting period.

This second variation request which proposed a modification to the Wandewoi BA required the revision of the Biodiversity Offset Strategy, the existing Biodiversity Areas Management Plans and the preparation of a management plan for the Hook Property. A revised BOMP that collates the various management plans into the one document was submitted to the DoEE on 31 October 2019 and, following additional discussions between HVO and DAWE, the entire documentation package was submitted in October 2020. HVO's request is still being considered by the DAWE along with the final documents that includes the Hook property. As the Hook property is being managed according to the submitted Biodiversity Management Plan, this Annual Compliance Report includes works undertaken within the Hook property.

2 Condition of Compliance

2.1 EPBC 2016/7640

Condition Number	Condition	Compliance status	Evidence/Comments
1	The **person taking the action** must not clear more than 54.4 hectares of the Central Hunter Valley Eucalypt Forest and woodland (CHVEF) ecological community from the Riverview Pit and 6.6 ha of the CHVEF ecological community from within the West Pit and must limit all vegetation clearing to within the project disturbance boundaries defined at Schedule 1, Figures 1 - 4.	Compliant	Disturbance limited to within project disturbance boundaries through the HVO Ground Disturbance Permit process. From within the EPBC areas, HVO has, in total, cleared 36.3 ha of CHVEF from Riverview Pit and 5.5 ha of CHVEF from West Pit. All vegetation clearing was restricted to within the State and Commonwealth approved project boundaries.
2	The **person taking the action** must prepare and submit a Vegetation Clearance Plan (VCP) for the **Minister's** approval to mitigate impacts of the action on the CHVEF ecological community, the Regent Honeyeater (*Anthochaera phrygia*), Swift Parrot (*Lathamus discolor*) and the Green and Golden Bell Frog (*Litoria aurea*). The VCP must include:	Compliant	Vegetation Clearance Plan (VCP) was submitted to the Department of Environment and Energy (DoEE) and approved by the Acting Assistant Secretary 24 October 2016. The VCP was modified in 2019 to update the format to reflect the current ownership of HVO and reviewed in October 2020.
2a	Clear delineation of vegetation to be cleared, as per the disturbance boundary shown in Schedule 1 Figures 1 - 4, and vegetation that is to be retained.	Compliant	These areas are outlined within Section 2.1 and Chapter 3 of the VCP. The areas to be cleared are first identified and approved within the GDP. In the field, the areas to be cleared were delineated by a surveyor prior to clearing.
2b	Pre-clearance survey methods, which must include but not be limited to the following requirements:		
	i. A **qualified ecologist** must undertake a pre-clearance survey within 24 hours prior to the removal of potential foraging, nesting or breeding habitat for the Regent Honeyeater or foraging habitat for the Swift Parrot in areas identified in Schedule 2, Figures 1 - 5.	Compliant	Chapter 3 of the VCP. All pre-clearance surveys were undertaken by qualified ecologist within 24 hrs prior to the commencement of clearing activities. No species listed or nests were identified during the surveys.
	ii. If during pre-clearance surveys, Regent Honeyeater or Swift Parrot individuals are identified within the clearance area the VCP must specify the use of a two stage clearing protocol where **non-habitat trees** are cleared 24 hours prior to any **habitat trees** being cleared, to encourage fauna to move out of a habitat area.	Compliant	Section 3.2 and 3.3 of the VCP. No species listed or nests were identified during the surveys.

iii.	In the event an **active Regent Honeyeater nest** is identified during pre- clearance surveys, vegetation clearing and overburden removal within 100 m of the active nest should be delayed up until the **Regent Honeyeater nest is no longer actively being used**.	Compliant	Section 3.3 of the VCP. No species listed or nests were identified during the surveys.
iv.	A qualified ecologist must undertake pre-clearance surveys within a 2 week period prior to the removal of potential breeding habitat for the Green and Golden Bell Frog. Surveys are to be undertaken within all potential breeding habitat areas identified in Schedule 2, Figure 2 as well as a 200m buffer around each potential breeding habitat area.	Compliant	Section 3.3 of the VCP. During the reporting year, no potential breeding habitats were removed, hence no surveys were required to be undertaken.
v.	Pre-clearance survey methods for the Green and Golden Bell Frog must meet the survey effort requirements for the Green and Golden Bell Frog stipulated in the Survey Guidelines for Australia's threatened frog (2010) Commonwealth of Australia	Compliant	Section 3.3 of the VCP. During the reporting year, no breeding habitat was removed, hence no surveys were required to be undertaken.
vi.	In the event Green and Golden Bell Frog individuals, metamorphs or tadpoles are located during pre-clearance surveys, they are to be handled and translocated in accordance with the Hygiene protocols for the control of diseases in frogs (2008) Department of Environment and Climate Change (NSW).	Not Triggered	Section 3.3 of the VCP. No GGBF were observed or heard within the EPBC area during the reporting period. The applicable hygiene protocols were implemented during the pre-clearance surveys.
2c	Include measures to avoid, suppress and control the spread of plant pathogens (such as *Phytophthora cinnamomi*) and *chytrid* fungus that may degrade habitat for **protected matters**. The action must not commence until the Vegetation Clearance Plan, required by Condition 2, has been approved by the **Minister**.	Compliant	Chapter 4 of the VCP. The VCP includes hygiene protocols to manage the spread of potential pathogens. The VCP requires wash down facilities to be used to remove soil and mud from clearing machinery prior to entering the HVO complex. The VCP also outlines measures to avoid the spread of Chytrid fungus from survey equipment, clearing machinery and during frog handling. HVO requires Ground Disturbance Permits (GDP) to be approved prior to any disturbance activities. Applicable GDPs prepared during the reporting year required proponents to comply with the veg clearance procedures required by HVO's EPBC 2016/7640 approval condition 2.
3	The approved Vegetation Clearance Plan must be implemented.	Compliant	Measures required by the VCP have been implemented for disturbance associated with Ground Disturbance Permits (GDP's) eg. GDP98, GDP100.

4	To compensate for residual impacts to **protected matters** the **person taking the action** must, under a **legally binding agreement**, secure in perpetuity 405.8 ha at the **Wandewoi Biodiversity Area**, described in 4(a)(b) and (c) within three (3) years from the date of this approval. The **Wandewoi Biodiversity Area** must include:	Compliant	Wandewoi Biodiversity Area was required to be secured in perpetuity by 10 October 2019. Due to the ongoing drought that occurred up to 2020 impacting the likelihood of success of the required rehabilitation of 230ha at Wandewoi, HVO proposed to substitute the grassland component of the Wandewoi BA for the CHVEF on the Hook property. This would require a revision of the boundaries of the Wandewoi BA on acceptance. Thus, a request for an extension to this date requiring Wandewoi to be secured was submitted to the then DoEE on 27 September 2018 and 18 October 2018. Discussions with DAWE have continued throughout 2019 and 2020. As at the time of this report, DAWE are preparing a submission for the Delegate for consideration of HVO's request.
4a	405.8 hectares of the CHVEF ecological community;	Compliant	Section 3.1 of the HVO Biodiversity Areas (BA) Management Plan summarises the vegetation communities within the BA: 175.8ha of Grey Box Woodland (CHVEF CEEC) and 230ha of Grey Box Derived Native Grassland (DNG). The revised HVO Biodiversity Areas Management Plan that was submitted to the DoEE for approval on 18 October 2019 includes detail on the Hook property and (in line with the discussions to date with DAWE) proposes the Wandewoi BA to be 234.1 ha within the larger 406.3 ha property.
4b	175.8 hectares of foraging habitat for the Swift Parrot; and	Compliant	Section 3.1 of the HVO Biodiversity Areas (BA) Management Plan summarises the vegetation communities within the BA: 175.8ha of Grey Box Woodland (CHVEF CEEC). This woodland component at Wandewoi remains unchanged in the revised HVO Biodiversity Areas Management Plan that includes detail on the Hook property.
4c	40 ha of regenerating foraging habitat for the Swift Parrot.	Compliant	Section 3.1 of the HVO Biodiversity Areas (BA) Management Plan summarises the vegetation communities within the BA: 230ha of Grey Box Derived Native Grassland (DNG). The DNG areas at Wandewoi will be regenerated to CHVEF, including 40 ha of foraging habitat for the Swift Parrot. The revised HVO Biodiversity Areas Management Plan proposes a larger regenerating foraging habitat area at Wandewoi as a result of the EPBC calculations with the Hook property swap.

5	To compensate for residual significant impacts to 22.7 ha of Class A condition CHVEF from the Riverview Pit extension area the **person taking the action** must identify a **direct offset site** that meets requirements of the **EPBC Act Offset Policy** and secure the offset in perpetuity under a **legally binding agreement** within 12 months from the date of approval of the Offset Strategy at Condition 10.	Compliant	Direct offset site at Mitchelhill detailed in Biodiversity Offset Strategy (Condition 10) was to be protected under a legally binding agreement by 23 October 2018. A conservation mechanism to secure the BAs was discussed with the NSW Biodiversity Conservation Trust and the Office of Environment and Heritage. A suitable mechanism could not be agreed upon and the DAWE has agreed that a s305 conservation mechanism may be appropriate. A request for an extension to this date to allow the HVO BAs to be secured under a s305 was submitted to the DoEE on 27 September 2018 and 18 October 2018. No formal response to the request has been received as at the time of this report. The date extension requires an approval variation which the DAWE intends to include with the Wandewoi variation. As at the time of this report, DAWE are preparing a submission for the Delegate for consideration of HVO's request.
6	To compensate for residual significant impacts to 68.4 ha of breeding and foraging habitat for the Regent Honeyeater the **person taking the action** must identify a **direct offset site** that meets requirements of the **EPBC Act Offset Policy** and secure the offset in perpetuity under a **legally binding agreement** within 12 months from the date of approval of the Offset Strategy at Condition 10.	Ongoing	Direct offset sites at Mitchelhill and Condon View detailed in Biodiversity Offset Strategy (Condition 10) is to be protected under a legally binding agreement by 23 October 2018. A conservation mechanism to secure the BAs was discussed with the NSW Biodiversity Conservation Trust and the Office of Environment and Heritage. A suitable mechanism could not be agreed upon and the DAWE has agreed that a s305 conservation mechanism may be appropriate. A request for an extension to this date to allow the HVO BAs to be secured under a s305 was submitted to the DAWE on 27 September 2018 and 18 October 2018. No formal response to the request has been received as at the time of this report. The date extension requires an approval variation which the DAWE intends to include with the Wandewoi variation. As at the time of this report, DAWE are preparing a submission for the Delegate for consideration of HVO's request.

7	To compensate for residual significant impacts to 2.6 ha of breeding habitat and 102.7 ha of foraging habitat for the Green and Golden Bell Frog the person taking the action must identify an **offset package** that meets requirements of the **EPBC Act Offset Policy** and secure a **direct offset site** in perpetuity under a **legally binding agreement** within 12 months from the date of approval of the Offset Strategy at Condition 10	Ongoing	Direct offset sites at Crescent Head detailed in Biodiversity Offset Strategy (Condition 10) is to be protected under a legally binding agreement by 23 October 2018. A conservation mechanism to secure the BAs was discussed with the NSW Biodiversity Conservation Trust and the Office of Environment and Heritage. A suitable mechanism could not be agreed upon and the DAWE has agreed that a s305 conservation mechanism may be appropriate. A request for an extension to this date to allow the HVO BAs to be secured under a s305 was submitted to the DAWE on 27 September 2018 and 18 October 2018. No formal response to the request has been received as at the time of this report. The date extension requires an approval variation which the DAWE intends to include with the Wandewoi variation. As at the time of this report, DAWE are preparing a submission for the Delegate for consideration of HVO's request.
8	Prior to securing the direct offsets required by Conditions 4, 5, 6 and 7 the **direct offset sites** and **legally binding agreements** must be agreed to by the **Minister**.	Compliant	Direct offset sites have been approved by the Assistant Secretary (DoEE) on 23 October 2017 through approval of the Biodiversity Offset Strategy – State Approved Mining (EPBC2016/7640) dated October 2017.
9	The action cannot continue for more than 12 months from the date of approval of the Offset Strategy at Condition 10, unless the **direct offset sites** required by Conditions 5, 6 and 7 have been secured in perpetuity under a **legally binding agreement** by the **person taking the action**.	Ongoing	Direct Offset Sites detailed in Biodiversity Offset Strategy (Condition 10) are to be protected under a legally binding agreement by 23 October 2018. The DoEE has agreed that a s305 conservation mechanism may be appropriate. To facilitate this, a change to the conditions of EPBC 2016/7640 is required and, hence, a variation to extend the date required to secure the BAs was submitted on 27 September 2018 and 18 October 2018. No formal response to the request has been received as at the time of this report. DAWE are preparing a submission for the Delegate for consideration of HVO's request.
10	Within six (6) months from the **commencement of the action** the **person taking the action** must prepare and submit an Offset Strategy for the **Minister's** approval. The Offset Strategy must specify the development of the offset package and how **direct offset sites** required by Conditions 5, 6 and 7 will be identified, secured and managed in perpetuity. The Offset Strategy must:	Compliant	Biodiversity Offset Strategy (BOS) – State Approved Mining (EPBC2016/7640) submitted to DoEE on 1 May 2017. Approved by the Assistant Secretary (DoEE) on 23 October 2017.
10a	Describe the development of the offset package and identify the proposed **direct offset sites** required by Conditions 5, 6 and 7, include a detailed description of the **direct offset sites** and demonstrate how the **direct offset sites** meet the **EPBC Act Offset Policy** and provide an adequate offset for the residual significant impacts to **protected matters**.	Compliant	Chapter 3, 4 and 5 of the BOS.

10b	Include proposed timeframes in which the **direct offset sites** will be secured by a **legal binding agreement** and a detailed description of how the **legally binding agreement** will secure the **direct offset sites** in perpetuity.	Compliant	Section 6.1 and 6.2 of the BOS. Note that discussions are continuing with the DAWE regarding implementing a s305 conservation mechanism to secure the sites in perpetuity.
10c	Proposed measures for the long term management of the **direct offset sites**.	Compliant	Section 6.4, 6.5 and 6.6 of the BOS.
	The Offset Strategy approved by the **Minister** must be implemented	Compliant	Biodiversity Offset Strategy (BOS) – State Approved Mining (EPBC2016/7640) approved by the Assistant Secretary (DoEE) on 23 October 2017. Direct Offset sites detailed in the BOS have been purchased and the management activities outlined in the BOS are being implemented at the BAs.
11	For the protection of the CHVEF as well as habitat for the Regent Honeyeater, Swift Parrot and Green and Golden Bell Frog the **person taking the action** must prepare and submit a Biodiversity Offset Management Plan (BOMP) for the **Minister's** approval within 12 months from the date of this approval. At a minimum, the BOMP must:	Compliant	Biodiversity Offset Management Plans were submitted to the DoEE for approval on the 10 October 2017 for the following: Wandewoi BA; Mitchelhill BA; Condon View BA; and Crescent Head BA. The DoEE's comments were incorporated into the BOMPs prior to resubmission. A revised BOMP that collates the various management plans into the one document was submitted to the DOEE on 31 October 2019.
11a	Clearly identify the **direct offset sites** described in Conditions 4, 5, 6 and 7. This must include **offset attributes, shapefiles**, textual descriptions and maps to clearly define the location and boundaries of the **direct offset sites**.	Compliant	Section 3.1 and 3.3 of the HVO BA Management Plan (MP) describes the direct offset site for CHVEF and Swift Parrot relevant to Condition 4 of the approval. Section 3.2 of the HVO BA Management Plan (MP) describes the direct offset site for CHVEF and Regent Honeyeater relevant to Condition 4 and Condition 6 respectively of the approval. Section 3.4 of the HVO BA Management Plan (MP) describes the direct offset site for Regent Honeyeater relevant to Condition 6 of the approval. Section 3.5 of the Crescent Head BA Management Plan (MP) describes the direct offset site for Green and Golden Bell Frog relevant to Condition 7 of the approval. The revised Biodiversity Area Management Plan submitted in 2019 addressed these matters in Section 3 for the respective BAs.

11b	Provide a description of the offset attributes for each **protected matter** and how the offset site meets the offset requirements under Conditions 4, 5, 6 and 7.	Compliant	Section 3.1 and 3.3 of the HVO BA MP describes the offset attributes for the CHVEF and Swift Parrot relevant to Condition 4 of the approval. Section 3.2 of the HVO BA MP describes the offset attributes for the CHVEF and Regent Honeyeater relevant to Condition 4 and Condition 6 respectively of the approval. Section 3.4 of the HVO BA MP describes the offset attributes for Regent Honeyeater relevant to Condition 6 of the approval. Section 3.5 of the HVO BA MP describes the offset attributes for Green and Golden Bell Frog relevant to Condition 7 of the approval. The revised Biodiversity Area Management Plan submitted in 2019 addressed these matters in Section 3 for the respective BAs.
11c	Provide a survey and description of the current condition (prior to any management activities) of the **direct offset sites** identified in Conditions 4, 5, 6 and 7.	Compliant	Section 3.1 and 3.3 of the HVO BA MP describes the offset attributes for the CHVEF and Swift Parrot relevant to Condition 4 of the approval. Section 3.2 of the HVO BA MP describes the offset attributes for the CHVEF and Regent Honeyeater relevant to Condition 4 and Condition 6 respectively of the approval. Section 3.4 of the HVO BA MP describes the offset attributes for Regent Honeyeater relevant to Condition 6 of the approval. Section 3.5 of the HVO BA MP describes the offset attributes for Green and Golden Bell Frog relevant to Condition 7 of the approval. The revised Biodiversity Area Management Plan submitted in 2019 addressed these matters in Section 3 for the respective BAs.
11d	Include detailed management actions, including regeneration and revegetation strategies to be undertaken at the **direct offset sites** to improve the ecological quality of these areas. The BOMP must also include: i. Management actions relating to improving habitat quality for **protected matters** including but not limited to: weed management, feral animal management, erosion and sediment control and fire management. ii. A description and timeframes that management measures would be implemented to improve the condition of CHVEF and habitat for the Regent Honeyeater, Swift Parrot and the Green and Golden Bell Frogs on the **direct offset sites**. iii. Performance and completion criteria for evaluating the management of the **direct offset sites**, and criteria for triggering remedial action. iv. A program to monitor and report on the effectiveness of these	Compliant	Chapter 5 of the HVO BA MP describes the detailed management actions, timing, performance criteria and completion criteria relevant to the direct offset site for the CHVEF and Swift Parrot. Chapter 5 of the HVO BA MP describes the detailed management actions, timing, performance criteria and completion criteria relevant to the direct offset site for the CHVEF and Regent Honeyeater. Chapter 5 of the HVO BA MP describes the detailed management actions, timing, performance criteria and completion criteria relevant to the direct offset site for the Regent Honeyeater. Chapter 5 of the HVO BA MP describes the detailed management actions, timing, performance criteria and completion criteria relevant to the direct offset site for the Green and Golden Bell Frog

	measures, and progress against the performance and completion criteria. v. A description of potential risks to the successful implementation of the plan, a description of the measures that will be implemented to mitigate against these risks and a description of the contingency measures that will be implemented if defined triggers arise. vi. Details of who would be responsible for monitoring, reviewing, and implementing the plan.		Chapter 6 of the HVO BA MP describes the monitoring program. Chapter 7 of the HVO BA MP provides a description of potential risks and corrective actions. Chapter 2 of the HVO BA MP provides responsibilities for the MP
12	The BOMP approved by the **Minister** must be implemented at the **direct offset sites** required to meet the requirements of Conditions 5, 6 and 7 within three (3) months from the date the offsets are secured under a **legally binding agreement**.	Not triggered	Direct Offset Sites required to meet Conditions 5, 6 and 7 are to be protected under a legally binding agreement by 23 Oct 2018. The DoEE has agreed that a s305 conservation mechanism may be appropriate. A request for an extension to this date to allow the HVO BAs to be secured under a s305 was submitted to the DoEE on 27 September 2018 and 18 October 2018. DAWE are preparing a submission for the Delegate for consideration of HVO's request and no formal response to the request has been received as at the time of this report. Note that the direct offset sites are being managed in accordance with the DoEE-reviewed draft management plans.
13	To ensure timely compensation for significant impacts to **protected matters**, the approved BOMP must be implemented at the **Wandewoi Biodiversity Area** within one (1) month from the date the BOMP is approved, regardless if the **Wandewoi Biodiversity Area** has been secured under a **legally binding agreement**.	Not triggered	Wandewoi BA Management Plan was submitted to DoEE for approval on the 10 October 2017. Although the BOMP is yet to be formally approved, management activities outlined in the BOMP are being implemented including: cultural heritage surveys, fencing, removal of grazing activities, track management, weed spraying and vertebrate pest control.
14	The person taking the action may choose to revise a management plan approved by the **Minister** without submitting it for approval under Section 143A of **the EPBC Act**, if the taking of the action in accordance with the revised management plan would not be likely to have a **new or increased impact** on a **protected matter** under the conditions of this approval. If the **person taking the action** makes this choice, they must:	Not triggered	
14a	Notify the Department in writing that the approved management plan has been revised and provide the Department with an electronic copy of the revised management plan;	Not triggered	
14b	Implement the revised management plan from the date that it is submitted to the Department; and	Not triggered	
14c	For the life of this approval, maintain a record of the reasons the person taking the action considers that taking the action in accordance with the revised management plan would not be likely to have a new or increased impact on a protected matter under the conditions of this approval.	Not triggered	

15	The person taking the action may revoke its choice under Condition 14 at any time by notice to the **Department**. If the person taking the action revokes the choice to implement a revised management plan, without approval under Section 143A of the EPBC Act, the management plan approved by the **Minister** must be implemented	Not triggered	
16	Condition 14 does not apply if the revisions to the approved management plan include changes to offsets provided under the management plan in relation to a matter protected by a controlling provision for the action, unless otherwise agreed in writing by the **Minister**. This does not otherwise limit the circumstances in which the taking of the action in accordance with a revised management plan would, or would not, be likely to have **new or increased impacts**.	Not triggered	
17	If the **Minister** gives a notice to the **person taking the action** that the **Minister** is satisfied that the taking of the action in accordance with the revised management plan would be likely to have a **new or increased impact** on a **protected matter** by the conditions of this approval, then:	Not triggered	
17a	Condition 14 does not apply, or ceases to apply, in relation to the revised management plan; and	Not triggered	
17b	The person taking the action must implement the previous management plan most recently approved by the Minister	Not triggered	
	To avoid any doubt, this condition does not affect any operation of conditions 14, 15 and 16 in the period before the day the notice is given. At the time of giving the notice the **Minister** may also notify that for a specified period of time that Condition 14 does not apply for one or more specified plans required under the approval	Not triggered	
18	If, at any time after 5 years from the date of this approval, the person taking the action has not **substantially commenced** the action, then the person taking the action must not **substantially commence** the action without the written agreement of the Minister.	Compliant	The action has commenced as per the notified Commencement of Action (1 November 2016).
19	Within 30 days after the commencement of the action, the person taking the action must advise the **Department** in writing of the actual date of **commencement**.	Compliant	Department of Environment and Energy advised by letter dated 9 November 2016 that the action had commenced in accordance with the approved Vegetation Clearance Plan on the 1 November 2016.
20	Unless otherwise agreed to in writing by the **Minister**, the person taking the action must publish all management plans, referred to in these conditions of approval on their website. Each management plan must be published on the website within 1 month of being approved by the **Minister** or being submitted under Condition 14.a	Not triggered	The HVO Biodiversity Areas Management Plan will be published when approved by the Minister.

21	The person taking the action must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the VCP, Offset Strategy and Biodiversity Offset Management Plan required by this approval, and make them available upon request to the **Department**. Such records may be subject to audit by the **Department** or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be publicised through the general media.	Compliant	All disturbance-related activities received prior approval through HVO's GDP process. Records of activities and outcomes are maintained by site personnel and stored within the document management system. Activities have been undertaken in accordance with the applicable conditions of approval and HVO's approved policies, plans and strategies.
22	Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the **Department** at the same time as the compliance report is published. Reports must remain on the website for the period this approval has effect. The approval holder may cease preparing and publishing compliance reports required by this condition with written agreement of the **Minister** to do so.	Compliant	HVO has published on its website compliance reports for the previous compliance reporting years. This compliance report outlines HVO's compliance with the approval conditions for 2020 (1 November 2019 – 31 December 2020). Note that the reporting year is being transitioned to the calendar year. Thus this report represents 14 months of activity.
23	Upon the direction of the **Minister**, the **person taking the action** must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.	Not triggered	

2.2 Vegetation Clearance Plan

Commitment	Compliance status	Evidence/Comments
1. A GDP will be completed and approved prior to any clearance in the extension areas.	Compliant	The GDP process is a mandatory process at HVO prior to any surface disturbance activities. All clearance activities that have occurred within the extension areas have gained prior conditional approval through HVO's GDP process.
2. Conduct pre-clearance surveys for CHVEF in accordance with Section 3.1.1	Compliant	Pre-clearance surveys have been undertaken prior to all clearance activities within the extension area.
3. Identify clearance limits on plans and on the ground.	Compliant	Prior to clearing, HVO surveyors peg and delineate the limit of the area to be cleared.
4. Conduct pre-clearance surveys for listed species in accordance with Section 3.3, 3.4 and 3.5.	Compliant	The pre-clearance surveys include targeted surveys for the listed species outlined (GGBF, Regent Honeyeater and Swift Parrot).
5. Manage listed species during vegetation clearance in accordance with Section 3.3.4, 3.4.4 and 3.5.4.	Compliant	None of the listed species have been identified as occurring within the area during the pre-clearance surveys or clearance activities.
6. All clearing machinery involved in vegetation and/or topsoil clearance in the extension areas will visit the wash-down facility for cleaning prior to exiting the HVO complex.	Compliant	As of 2020, HVO's Introduction to Site (ITS) process requires all earthmoving contractors to document and provide evidence that equipment wash downs have occurred prior to coming onsite.
7. Disinfection measures are implemented in accordance with Section 4.1.2.	Compliant	All equipment is disinfected prior, and following, the pre-clearance surveys. This process is outlined in the pre-clearance survey reports.
8. Records will be kept in accordance with Section 5.2.	Compliant	Actions occurring during the pre-clearance surveys have been documented in each pre-clearance survey report. Earthmoving contractors must document and provide evidence that equipment wash downs have occurred prior to coming onsite. As of 2020, a process improvement will be implemented to track and document this requirement.
9. Publish the annual compliance report on the proponent's website.	Compliant	This compliance report will be placed on the HVO public website prior to submission.

3 New Environmental Risks and Potential threats to Matters of National and State Environmental Significance

No additional environmental risks or threats to matters of national environmental significance have been identified during the reporting period.

4 Summary of Climatic Conditions

Table 4.1 shows the monthly rainfall compared to the long term average for the BAs. The rainfall received during 2020 exceeded the annual average.

Table 4.1. Rainfall received during 2020 against the average annual rainfall occurring at each of the BAs.

Site	Weather station	Annual Rainfall Received (mm)	Annual Average (mm)	Surplus/Deficit (mm)
Condon View	Putty Tea Rooms # 61209	1100.8	737.3	+363.5
Crescent Head	Crescent Head # 59047	1543.3*	1447.0	+96.3
Hook	Elderslie # 61092	931	719.3	+211.7
Mitchelhill	Muswellbrook (St Heliers) # 61374	792.4	603.8	+188.6
Wandewoi	HVO	793	604.9	+188.1

*Crescent Head Dec rainfall was not recorded. December value was substituted with the monthly average of all years to determine yearly rainfall.

5 Summary of Activities - 2020

Various conservation, monitoring, management and maintenance activities were undertaken within the BAs throughout the reporting period between 1 November 2019 and 31 December 2020. An overview of the various activities that occurred is presented in Table 5.1.

Table 5.1. Overview of activities undertaken within the HVO EPBC 2016/7640 BAs during the reporting period.

Site	Activities undertaken during the reporting period
Condon View	Property inspections, condition assessment monitoring, bird assemblage monitoring, photo reference monitoring, weed control, vertebrate pest management and bushfire assessment.
Crescent Head	Slashing of boundary firebreaks and internal access tracks, weed control, internal fence removal, pig trapping, condition assessment monitoring, frog monitoring, mosquito fish monitoring, photo reference monitoring, property inspections and bushfire assessment.
Hook	Replacement of boundary fence and repair of fencing in other areas, track repair and upgrade, development of intensive weed management plan, condition assessment monitoring, bird assemblage monitoring, photo reference monitoring, property inspections, African Olive mapping and weed control, vertebrate pest management, slashing of boundary firebreaks and internal access tracks and bushfire assessment.
Mitchelhill	Property inspections, weed management and treatment of of planted areas, internal fence removal, condition assessment monitoring, bird assemblage monitoring, photo reference monitoring, vertebrate pest management, repair and slashing of boundary firebreaks and internal access tracks, tubestock planting, watering of rehabilitated areas and bushfire assessment. **Activities specific to the eastern BA**: dry matter assessment, grazing management. **Activities specific to the western BA**: Scrap metal and machinery removal, installation of fence around cultural heritage PAD area, replacement of boundary fence.
Wandewoi	Slashing of boundary firebreaks and internal access tracks, boundary fence repair, track upgrade, biomass assessments, grazing management, property inspections, condition assessment monitoring, bird assemblage monitoring, photo reference monitoring, weed control, vertebrate pest management and bushfire assessment.

5.1 Residual Compensatory Measures

On the 25th November 2019, the Department of the Environment and Energy (now Department of Agriculture, Water and the Environment) approved HVO's estimates that the residual offset liability identified in the approved Offset Strategy was $24,510. It was also agreed that the proposed projects would constitute an appropriate project on which to spend the required money.

In 2020, HVO entered an agreement with the Biodiversity & Conservation Division of the NSW Department of Planning, Infrastructure and Environment to contribute these funds towards a fine-scale wetland mapping project around the Crescent Head area, and a GGBF habitat mapping within the identified study area. The wetland mapping project occurred in October 2020 and was finalised, while the habitat mapping is planned to occur in March 2021.

The report for the wetland mapping project is attached in Appendix A.

5.2 Property Inspections and Activities

Property inspections were undertaken regularly across all the BAs during the reporting period and provided critical advice regarding works that needed to be prioritised. A summary of the condition of each BA based on the property inspection reports is as follows:

Condon View

Condon View has few serious management issues and does not appear to have issues with illegal access. Despite being logged at some point many years ago, the site is well vegetated, has negligible weeds and recruitment of various native species has been observed. A small amount of metal waste and redundant fencelines were removed to an offsite waste transfer facility during the reporting period. Approximately 530m of redundant internal fenceline, remnant corrugated iron and an old fridge was removed. Localised areas of erosion along the access tracks will require monitoring to ensure access is not impeded. The presence of wild dogs were noted, as were wombat prints and burrows, a bower bird nest, long necked turtle and the typical kangaroos, wallabies and native bird species.

Although in close proximity, the extensive fire within the Wollomi National Park did not impact the HVO Condon View BA.

Figure 5.1. Bower bird nest and wombat print witin the Condon View BA.

Crescent Head

The Crescent Head BAs have minimal waste and are well vegetated. During the reporting period, no new damage to vegetation or illegal trespass was recorded. The tracks were slashed during 2020 to facilitate safe access and pig trapping occurs each year.

Additional ponds have been established at both sites to develop breeding habitats that will remain free of mosquito fish. These ponds will be managed in accordance with the Best Practice Guidelines Green and Golden Bell Frog Habitat (2008) Department of Environment and Climate Change NSW.

Crescent Head North is in good condition but does have some minor weed issues at the exposed edges of vegetation. As it is liable to flooding events, weed incursion and feral aquatic pests have been recorded within low lying areas and aquatic habitats. The weeds are being managed and the few existing internal fencelines will be retained to contain any potential stray cattle from adjacent properties. Management issues relate to ongoing weed management, track vegetation regrowth maintenance and fallen vegetation. The Biosecurity Undertaking with the Kempsey Shire Council to ensure the removal of the Tropical Soda Apple is ongoing. A small number of stacked roofing tiles can be found near Pond 1 at Crescent Head

North. Being inert, these are being retained in situ as additional habitat for frogs such as the Green and Golden Bell Frog.

Crescent Head South is also in good condition but requires grass biomass management in areas to reduce the risk of bushfire. The management issues include maintaining integrity of the fenceline from fallen debris and slashing regrowth to maintain movement corridors for frogs.

Figure 5.2. GGBF frog pond installation at the Crescent Head North BA.

Figure 5.3. GGBF frog pond installation at the Crescent Head South BA.

Hook

The primary management issues within the Hook property include fence maintenance to exclude neighbouring cattle and the removal of African Olive. With the exception of the African Olive, exotic grassland weeds are primarily concentrated within the grassland areas. A diverse suite of native species is recruiting across all areas of the site but active management of the exotic grasslands are required.

During the reporting period, no damage to vegetation or illegal trespass was recorded. The entrance track was regravelled to repair erosion, tracks were slashed and extensive weed control and vertebrate pest management occurred.

In February 2020, the Hook property was surveyed to record the locations of all African olive individuals and an intensive programme has been implemented to control this invasive exotic species. Should the proposal to accept the Hook property be accepted by the Delegate, HVO has committed to implementing the Hook BA Intensive Weed Management Plan which exceeds the requirements of the *General Biosecurity Duty Control Guidelines* to reduce the cover of African Olive by 20% per year. Until a decision has been made, the Hook property is being managed and monitored according to the HVO Biodiversity Areas

Management Plan which includes the activities committed to under the Hook BA Intensive Weed Management Plan. Extensive management of African Olives has occurred to date concentrating on the boundaries and towards the north west of the site. Remapping for calculations will be done in February 2021.

Mitchelhill

The Mitchelhill West BA is in good condition. During the reporting period, no damage to vegetation or illegal trespass were recorded. The tracks are in fair condition. Prickly pear is the major weed present within the BA and is being actively controlled through the weed programme.

The Mitchelhill East BA is primarily steep country which is why it is predominately vegetated with few cleared areas. Minimal weeds are present on the BA. Narrow leaf cotton bush and fireweed are sparsely scattered and are targeted through the weed programme. Natural regeneration is occurring within the BA and extending into the cleared grassland areas. A quoll was sighted within the BA near the rehabilitation area. No photos are available of this interaction. It is noted that quolls have been recorded previously along the Mitchelhill East ridgeline so it is possible that a resident population occurs in the area.

Supplementary planting of plants representative of CHVEF were installed within the rehabilitation areas on both sites to replace those planted during 2019 that died as a result of the drought. 2390 plants were installed at Mitchelhill West while 760 plants were installed in Michellhill East.

Approximately 400m of redundant internal fences was removed from the Mitchelhill West BA and approximately 1200m of internal wire and post fencing was removed from the Mitchelhll East BA. In addition, Mitchelhill West had 1km boundary fence and gates replaced and upgraded, and the identified Aboriginal cultural heritage PAD area was fenced to restrict access across the area. This comprised the installation of 800m of fencing and a gate to facilitate maintenance of the tubestock planted within the areas being rehabilitated.

Wandewoi

The Wandewoi BA had extensive germination of annual weeds with the return of typical rainfall during 2020. This germination was not restricted to the Wandewoi property and was commonly observed across the Hunter Valley. The majority of the growth was in the cleared, previous agricultural areas, although weed growth did occur within the gullies and protected areas. Slashing and cattle grazing assisted to manage the weed growth where possible.

Erosion along the steep northern track was repaired and a section of the boundary fence was replaced.

Cultural heritage barriers are being progressively maintained and vertebrate pests (pigs and wild dogs) are routinely managed during trapping and baiting programmes along the Hunter River in the western portion of the BA. The woodland along the ridgeline is in good condition with recruitment occurring in areas.

5.3 Biomass Assessments

Biomass assessments were undertaken at the Mitchelhill and Wandewoi biodiversity areas during the reporting period. The intent was to introduce cattle to crash graze the reduce the grassy biomass within specific areas ahead of the fire season. The biomass assessments would occur pre and post the introduction of cattle to the areas to be grazed to assist to determine the effectiveness of the activity.

Mitchelhill East

A section of the Mitchelhill East BA was grazed between September and November 2019. The grazing area was restricted to the area to be rehabilitated. Water supply and lick blocks for the cattle was provided in an adjoining paddock outside the BA.

The drought in 2019 restricted the grass growth so most of the herbage was dry stems and leaf with green leaf in small amounts at the base of plants and in the gully. The assessments determined that the herbage mass commenced at 4600 kg DM/ha which was reduced to 3200 kg DM/ha on cessation of grazing.

While the assessments determined that the herbage mass had decreased as intended, grazing did not remove as much of the tall, rank grass that was required to reduce the fire fuel load. Lessons from this activity will be applied to future fire management activities at Mitchelhill East, although the planned rehabilitation of the area that was grazed will prevent the use of cattle to reduce the grassy biomass in future seasons.

Wandewoi

With the break of the drought during 2020, weed and exotic pasture growth has been vigorous due to the reduced ground cover competition associated with the drought. The weed flush was dominated by Farmers Friend (*Bidens pilosa*) and various thistle species. The proliferation of these weeds has been common across the district and is not confined to the Wandewoi BA.

While some of the terrain at Wandwoi is suitable for slashing, the steeper and rockier areas preclude the use of the slasher due to accessibility. Access to some areas is also difficult for herbicide spraying and hence cattle was to be introduced to trample and reduce the weed biomass in these areas where possible.

In September 2020, a biomass assessment was undertaken across the Wandewoi BA. The assessment determined that the average herbage mass across the whole BA was 3800 kg DM/ha. Slashing and cattle grazing have enabled the weed load to be reduced, although with the ongoing La Nina weather pattern encouraging vegetative growth, more management of the weeds is occurring.

Should the Hook property be accepted as a biodiversity area by the Delegate, the areas subject to the weed growth that were predominately grazing lands will be removed from the Wandewoi BA and returned to agricultural grazing. Efforts to manage weeds within the revised Wandewoi BA may then concentrate on the gullies and southern facing slopes.

5.4 Vertebrate Pest Management

Vertebrate pest management has been undertaken within all of HVOs EPBC biodiversity areas in conjunction with the Local land Services (LLS), NSW National Parks and Wildlife Services (NPWS) and surrounding landholders.

The wild dog baiting programme occurred across the Mitchelhill (East and West), Hook, Wandewoi and Condon View BAs. While no dog baiting programmes occurred at the Crescent Head BA, a pig trapping programme was undertaken during 2020 based on evidence of a small number of pigs traversing the property. The property inspection reports at Crescent Head have not indicated a need to undertake wild dog and fox control to manage predation on the Green and Golden Bell Frog. Discussions around regional dog baiting programmes have occurred with the Kempsey NPWS due to the Crescent Head BAs adjoining the Limeburners Creek and Hat Head National Parks. To date, NPWS officers have indicated a reluctance to bait for dingos due to a ‘pure’ population of dingos occurring within Limeburners Creek National Park (pers comm.).

1080 Baiting Programme

Wild dog baiting programmes within the BAs occurred during May and October 2020. Ten-eighty (1080) bait stations are selected based on previous baiting station locations, motion camera results from previous programs and sightings of wild dogs and foxes, biodiversity concerns and the location of tracks and trails within the offsets. Stations were either established as Ejector Bait Sites or baited with fresh meat containing sodium fluoroacetate (1080) at a concentration that targeted wild dogs and foxes.

The ground baiting method used aligns with the *Humane pest animal control: Code of Practice and Standard Operating Procedures* produced by NSW Department of Primary Industry (DPI) and amended in September 2019.

The location of the baits within each BA and the frequency that the baits were taken for the spring 2020 programme are shown in figures 5.4 to 5.8.

The spring 2020 vertebrate pest management programme represented the sixth baiting programme undertaken at the Mitchelhill, Hook and Wandewoi BAs, and the seventh undertaken at the Condon View BA. Some of the native fauna recorded on the motion sensor cameras during the baiting programmes are shown in Section 7.

A summary of the baiting programmes undertaken at the BAs is outlined in Table 5.2. A comparison of the baiting results across all sites between 2018 and 2020 indicates that the baiting programme does not follow a linear decline in baiting results despite efforts and expenditure. The vertebrate pest management programme will continue during 2021.

Table 5.2. Comparison of Results of all 1080 Vertebrate Pest Management Programmes for HVO Biodiversity Areas.

Baiting Program	No. of Baiting Sites	Baiting opportunities	Baits taken by Dogs	Dog (%)	Baits taken by Foxes	Fox (%)	Baits taken by other (non-target) species	Other (%)	Total No. of Baits Taken	No. Sites where baits taken at least once	Represented as Percentage (%)	No. sites with baits taken on all occasions	No. sites with no baits taken	No. baits Disturbed Not Taken	No. baits taken alternatively by Dog or Fox	Baiting Efficiency %	Baiting efficiency (excl 'other')
Jun 18 LBEL	11	22	7	88%	1	13%	0	0%	8	8	73%	0	3	1	0	36%	36%
Sep 18 LBEL	11	22	7	100%	0	0%	0	0%	7	5	45%	2	6	3	0	32%	32%
May 19 LBEL	11	21	2	67%	1	33%	0	0%	3	3	27%	0	8	0	0	14%	14%
Oct 19 LBEL	11	22	13	65%	5	25%	2	0%	20	9	82%	7	2	0	5	91%	82%
May 20 LBEL	11	22	9	100%	0	0%	0	0%	9	8	73%	1	3	1	0	41%	41%
Oct 20 LBEL	11	22	8	47%	6	35%	3	18%	17	10	91%	8	1	2	2	77%	64%
Jun 18 MITE	6	12	2	50%	2	50%	0	0%	4	4	67%	0	2	0	0	33%	33%
Sep 18 MITE	6	11	1	50%	1	50%	0	0%	2	1	17%	1	5	1	1	18%	18%
May 19 MITE	6	12	2	100%	0	0%	0	0%	2	2	33%	0	4	0	0	17%	17%
Oct 19 MITE	6	12	0	0%	2	100%	0	0%	2	2	33%	0	4	5	0	17%	17%

Baiting Program	No. of Baiting Sites	Baiting opportunities	Baits taken by Dogs	Dog (%)	Baits taken by Foxes	Fox (%)	Baits taken by other (non-target) species	Other (%)	Total No. of Baits Taken	No. Sites where baits taken at least once	Represented as Percentage (%)	No. sites with baits taken on all occasions	No. sites with no baits taken	No. baits Disturbed Not Taken	No. baits taken alternatively by Dog or Fox	Baiting Efficiency %	Baiting efficiency (excl 'other')
May 20 MIT E	6	12	2	100%	0	0%	0	0%	2	2	33%	0	4	2	0	17%	17%
May 20 MIT E	6	12	0	0%	1	100%	0	0%	1	1	17%	0	5	0	0	8%	8%
Jun 18 MITW	11	22	7	78%	2	22%	0	0%	9	6	55%	3	5	0	0	41%	41%
Sep 18 MITW	11	22	9	64%	1	7%	4	29%	14	9	82%	5	2	0	1	64%	45%
May 19 MITW	11	22	8	67%	4	33%	0	0%	12	9	82%	3	2	3	1	55%	55%
Oct 19 MITW	11	22	15	75%	4	20%	1	5%	20	11	100%	9	0	1	2	91%	86%
May 20 MIT W	10	20	7	70%	3	30%	0	0%	10	8	80%	2	2	2	2	50%	50%
Oct 20 MIT W	11	22	11	55%	7	35%	2	10%	20	10	91%	10	1	0	5	91%	82%
Jun 18 WAN	6	12	7	88%	1	12%	0	0%	8	6	67%	1	2	2	1	67%	67%
Sep 18 WAN	6	12	9	100%	0	0%	0	0%	9	6	100%	3	0	0	0	75%	75%

Baiting Program	No. of Baiting Sites	Baiting opportunities	Baits taken by Dogs	Dog (%)	Baits taken by Foxes	Fox (%)	Baits taken by other (non-target) species	Other (%)	Total No. of Baits Taken	No. Sites where baits taken at least once	Represented as Percentage (%)	No. sites with baits taken on all occasions	No. sites with no baits taken	No. baits Disturbed Not Taken	No. baits taken alternatively by Dog or Fox	Baiting Efficiency %	Baiting efficiency (excl 'other')
May 19 WAN	6	12	5	83%	1	17%	0	0%	6	4	67%	2	2	0	1	50%	50%
Oct 19 WAN	6	12	7	88%	0	0%	1	13%	8	5	83%	3	1	2	0	67%	67%
May 20 WAN	6	12	5	71%	2	29%	0	0%	7	4	67%	3	2	1	0	58%	58%
Oct 20 WAN	6	12	6	86%	1	14%	0	0%	7	5	83%	5	1	0	1	58%	58%

Note:

MITE = Mitchelhill East BA
MITW = Mitchelhill West BA
WAN = Wandewoi BA
CON = Condon View BA
LBEL = Lower Belford (Hook)

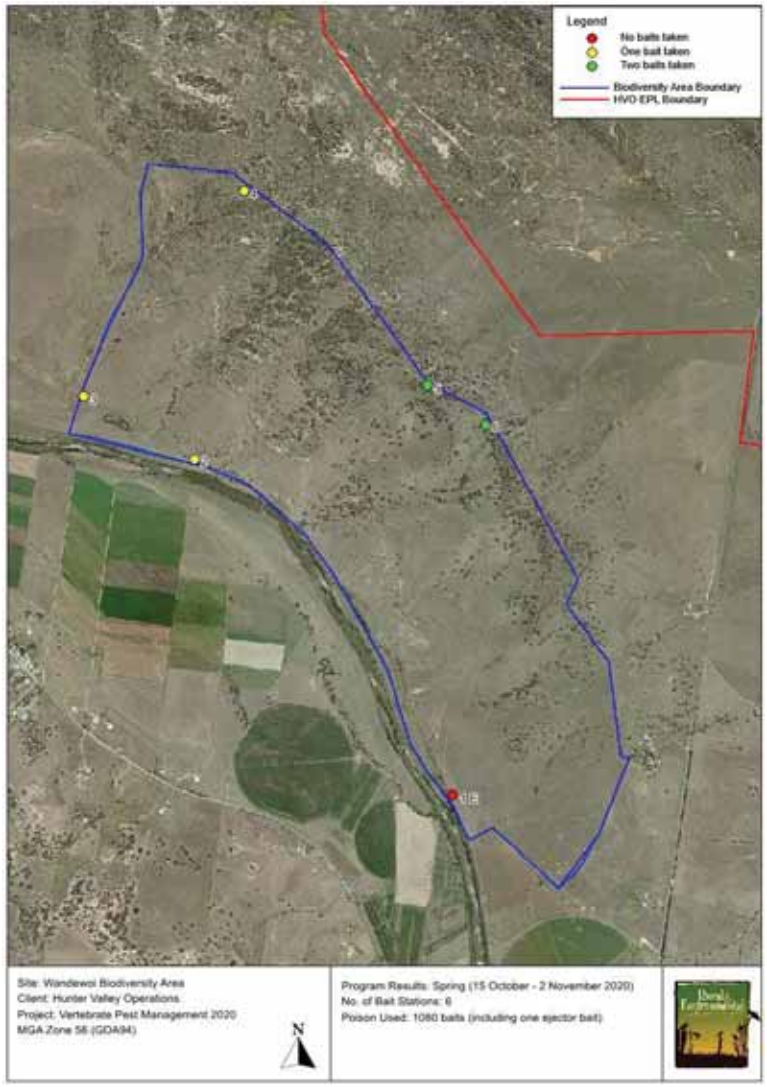

Figure 5.4. Wandewoi BA vertebrate pest management results for the Spring 2020 Program.

Figure 5.5. Hook property vertebrate pest management results for the Spring 2020 Program.

Figure 5.6. Mitchelhill East BA vertebrate pest management results for the Spring 2020 Program.

Figure 5.7. Mitchelhill West BA vertebrate pest management results for the Spring 2020 Program.

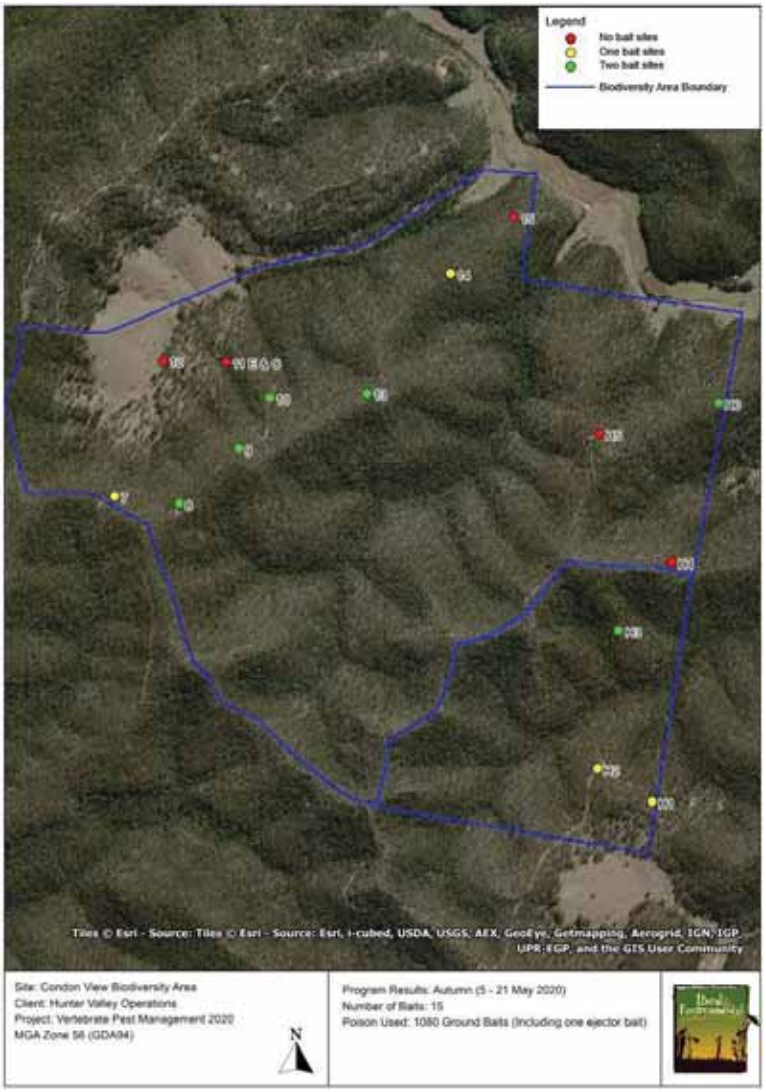

Figure 5.8. Condon View BA vertebrate pest management results for the Spring 2020 Program.

Note: this figures illustrates the entire Condon View property which also includes the adjoining State offset for Yancoal's Mount Thorley Warkworth mine. The area applicable to EPBC 2016/7640 include the six bait stations along the eastern boundary.

2020 Pig Trapping Programme

During 2020, HVO undertook pig monitoring and trapping programmes across HVO and the Crescent Head BA. The programme was in response to monitoring results and observations that reported pigs traversing the Hunter River and accessing water bodies at the Crescent Head BA.

Baiting and traps were established at various locations along the Hunter River, including a site within the Wandewoi BA, and three locations at the Crescent Head BAs (Fig 5.9 to 511).

Each trap was baited inside and outside the trap and monitored with either a live stream HogEye Camera trap system or standard motion sensor camera system. This system allows for remote activation of the trap and aligns with the Code of Practise and Standard Operation Procedures.

Each station was checked daily using the live web based system and visited if required to restock food or access the trap.

The Wandewoi BA trap received a total of 10 trapping days with no pigs caught during this time (Table 5.3).

At the Crescent Head BAs, Site 1 showed no signs of pig visitation and was withdrawn. The remaining two sites had a total of 88 trapping days. One boar was caught at Pig Trap 2 and, while two additional pigs were recorded on camera, they did not return to the traps during the programme (Table 5.4).

Pig trapping occurs twice a year at HVO which will include the Wandewoi BA again in 2021. A repeat trapping programme will occur at the Crescent Head BAs during 2021 should monitoring results indicate that the pigs still traverse the area.

Table 5.3. HVO 2020 Pig Trapping Summary and Results.

Trap Reference	Free Feeding Notes 1/06/2020	Free Feeding Notes 5/06/2020	Trapping Days 8/06/2020-19/06/2020	Pigs Trapped
Pest Trap 1	20kg Cracked Corn and camera added	No Sign	0	0
Pest Trap 2	20kg Cracked Corn and camera added	No Sign	0	0
Pest Trap 3	20kg Cracked Corn and camera added	Baits taken and trap set	10	8
Pest Trap 4	20kg Cracked Corn and camera added	5kg eaten - site refed - no sign	0	0
Pest Trap 5	20kg Cracked Corn and camera added	5kg eaten - site refed - camera stolen - no sign	0	0
Pest Trap 6	20kg Cracked Corn and camera added	No Sign	0	0
Pest Trap 7	20kg Cracked Corn and camera added	No Sign	0	0
Pest Trap 8	20kg Cracked Corn and camera added	No Sign	0	0
10 Trapping Days = 8 pigs				

Note: Pest Trap 8 is located within the Wandewoi BA.

Table 5.4. 2020 Crescent Head Pig Trapping Summary and Results.

Trap Reference	Free Feeding Notes 4/8/2020	Free Feeding Notes 29/8/2020	Trapping Days 29/9/2020-12/9/2020	Pigs Trapped
Pest Trap 1	20kg cracked corn and camera added	No sign – site abandoned	0	0
Pest Trap 2	20kg cracked corn, trap and Hogeye camera added	20kg eaten - site refed and trap set	44	1
Pest Trap 3	20kg cracked corn, trap and Hogeye camera added	20kg eaten - site refed and trap set, pigs did not return	44	0
88 trapping Days = 1 pig				

Figure 5.9. Pig trap locations along the Hunter River and Wollemi Brook at HVO during the winter 2020 programme.

Note: Pest Trap 8 is located within the Wandewoi BA.

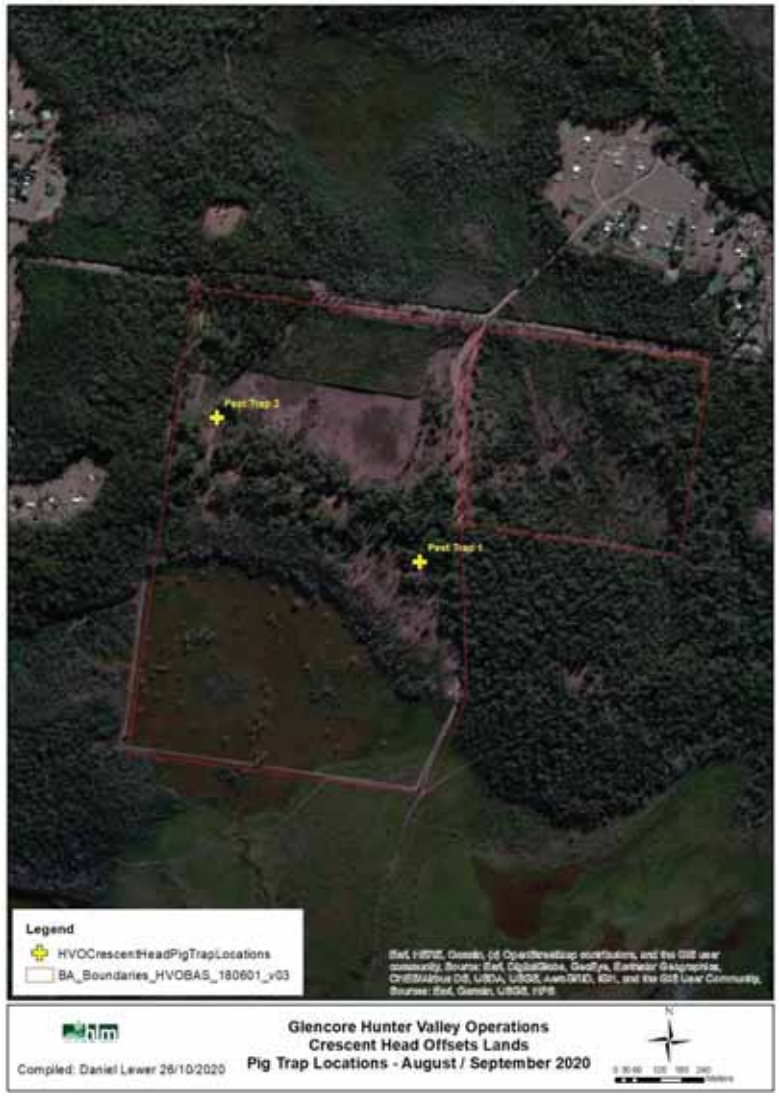

Figure 5.10. Pig trap locations 1 and 2 at Crescent Head South BA during the spring 2020 programme.

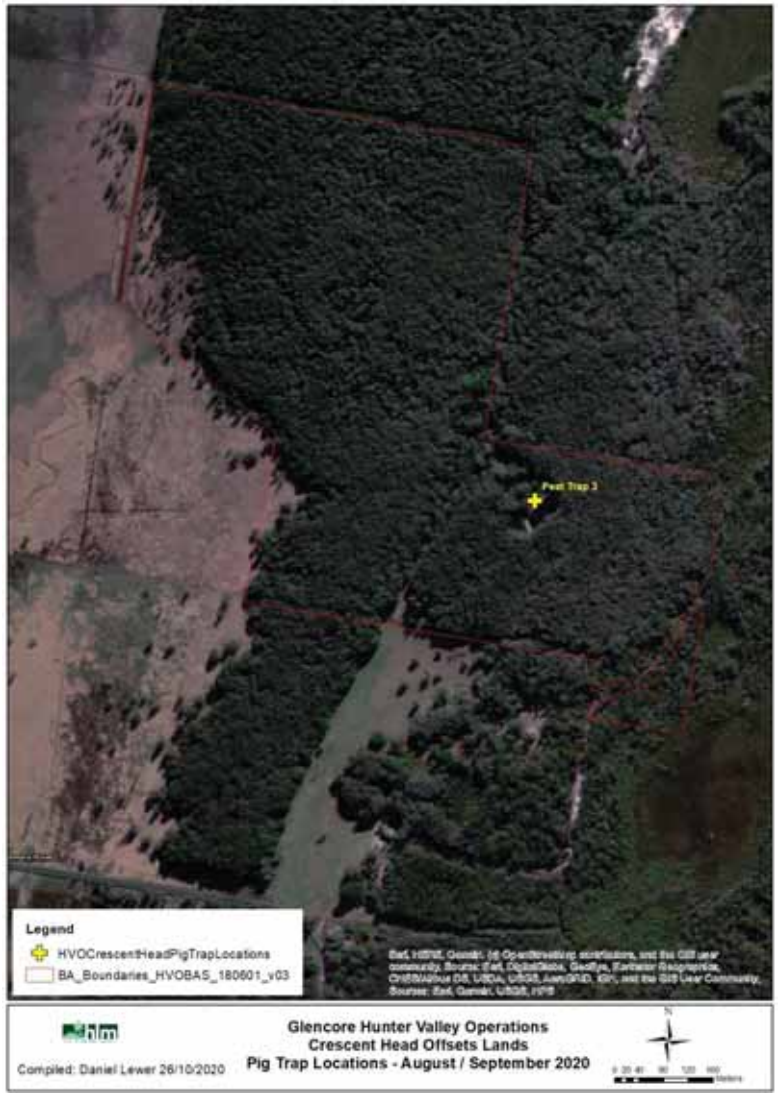

Figure 5.11. Pig trap location 3 at the waterhole within the Crescent Head North BA during the spring 2020 programme.

6 Monitoring

The monitoring programme is designed to assess the changes in the habitat of the offsets at three different scales:

- Landscape monitoring (long-term 10-15 years):
  - Hunter Valley BAs – to assess vegetation changes and habitat connectivity at the landscape scale in the long-term (10-15 years).
- Ecological monitoring (short to medium-term):
  - Hunter Valley BAs – condition assessment monitoring to assess habitat condition by quantifying changes in vegetation structure.
  - Hunter Valley BAs – bird assemblage monitoring to assess changes in bird assemblages.
  - Crescent Head BA – threatened species monitoring to determine if the habitat management, Mosquito Fish management and construction of offline ponds have resulted in Green and Golden Bell Frog use of the BA.
  - Crescent Head BA – habitat monitoring to assess improvements in breeding, foraging and movement habitat structure by quantifying changes in vegetation structure.
- Management monitoring (short-term):
  - All BAs – rapid condition assessments and property inspections to assess woodland and habitat condition and identify emerging threats.
  - Hunter Valley BAs – survival assessment to assess the success of re-establishment actions.
  - Crescent Head BA – Mosquito Fish monitoring to assess the presence and abundance of Mosquito Fish in the ponds.

The objectives of the monitoring programme is to confirm whether the HVO Biodiversity Areas Management Plan is being effectively implemented and conservation objectives are being achieved.

The frequency of monitoring activities will vary according to the monitoring schedule outlined in Table 6.1. Additional opportunistic monitoring did occur and is reported in this annual compliance report.

The landscape monitoring requires an interpretation of aerial photo images of the BAs over time and is not considered in this compliance report. This report provides a summary of investigations around both the ecological and management monitoring activities.

During the reporting period, opportunistic monitoring of the Green and Golden Bell Frog occurred at Crescent Head South due to the extent of rain experienced. HVO also undertook additional bird assemblage monitoring at Condon View. The details of these additional monitoring events are outlined in the sections below.

Table 6.1.Monitoring schedule in the Biodiversity Area Management Plan

Monitoring method	2018	2019	2020	2021	2022	2023	2024-2028
Landscape							
Aerial photo interpretation	X						X
Ecological							
Condition Assessment	Spring	Spring		Spring		Spring	If required
Bird Assemblage	Winter	Winter		Winter		Winter	If required
GGBF – monitoring	Sept – March			Sept - March			Every 4th year
GGBF – habitat assessment	Spring	Spring		Spring		Spring	Biennial
Management							
Rapid Condition Assessment		Spring	Spring	Spring	Spring	Spring	If required
Property Inspection	Biannual						
Mosquito Fish	Biannual			Annual			If required

6.1 Survival Assessments

CHVEF reestablishment through the planting of tubestock occurred in 2019 at the Mitchelhill BA. A specific survival assessment was not undertaken, however, despite extensive watering and the use of water crystals placed beneath the tubestock, preliminary examinations indicate that with the extreme heat and environmental conditions faced in 2019 and early 2020, it was anticipated that planting of supplementary tubestock would be required to comply with the Biodiversity Areas Management Plan.

Supplementary planting and follow up watering occurred during autumn and winter 2020 and are anticipated to have better survival rates given the better growing season experienced with the 2021 La Nina.

6.2 Ecological Monitoring

The following table provides a summary of the ecological monitoring activities undertaken across the various BAs as outlined in the management plan.

Table 6.2. Ecological monitoring activities completed during the reporting year.

Monitoring event	Site	Months
Condition assessment	Condon View	Additional assessment occurred in November 2020
	Hook, Mitchelhill, Wandewoi	None planned for 2020
	Crescent Head	None planned for 2020
Bird assemblage	Condon View	Additional survey occurred in 2020
	Hook, Mitchelhill, Wandewoi	None planned for 2020
GGBF monitoring	Crescent Head	Additional survey occurred in 2020
Mosquito Fish monitoring	Crescent Head	As scheduled for 2020
Rapid condition assessment	Condon View	Completed
	Crescent Head	
	Hook	
	Mitchelhill	
	Wandewoi	
Property inspections	Wandewoi	March, April, June, July, September, October 2019
	Mitchelhill	November, December 2018, February, March April, June, July, September, October 2019
	Hook	November 2018, February, March, April, June, July, September, October 2019
	Condon View	January, March, June, July, October 2019
	Crescent Head	November 2018, April, August, October 2019

6.2.1 Rapid Condition Assessments

The rapid condition assessments were reviewed during the reporting period which resulted in some minor revision of the sites. In particular, additional sites were added to the Condon View BA to ensure sufficient coverage to enable a comparison of the condition to be determined. Hence, at these additional sites, the assessment commenced in 2020 and will be the baseline data against which future assessments will be examined.

Where a comparison can be made, the improvement in the 2020 data is largely attributable to the increased native ground flora arising from the break of the drought.

The locations and tables are provided in Appendix B.

6.2.2 Condition Assessment

No vegetation or habitat condition assessments were scheduled for the 2020 reporting period. As the management of some of the sites is transitioning from a shared model between HVO's joint venture partners to being wholely managed by HVO, it has become necessary to revise the monitoring methodology and locations to supplement monitoring that has occurred to date. As a result of the need to supplement monitoring data, an additional condition assessment occurred at the Condon View BA during 2020 and is discussed below.

Biometric attributes measured and estimated in plot data were compared to benchmark data to determine a relative condition of each plot. The locations of each site within Condon View is illustrated in Figure 6.1, the site attributes scored for each plot to infer relative condition is provided in Table 6.3 and the data is presented in Table 6.4.

Native plant species richness has increased towards the benchmark values for the canopy and ground cover layers. Shrub diversity has remained low since 2016.

The % cover of the vegetation layers is more variable. The canopy and grass cover remains close to the benchmark attaining the moderate to high condition category, relative to the benchmark. The shrub layer is sparse, and hasn't improved over time and the native ground cover (including forbs, ferns and other species) is variable.

The diversity of exotic species has been variable but importantly, the % cover of exotic species has been consistently low.

It is noted that benchmark values have been based on averaged data collected over a range of seasons subject to average rainfall. Deviation from benchmark values may occur if rainfall is below average leading up to future monitoring periods.

Table 6.3.Summary of plot data collected at Condon View and an assessment of relative condition.

Site attribute	Condition relative to benchmark values			
	Very low	Low	Moderate	High
Tree richness	0-10%	>10-<50% of benchmark	50-<100% of benchmark	≥ benchmark
Shrub richness				
Grass and grass like richness				
Forb richness				
Fern richness				
Other richness				
Tree cover	0-10% or >200% of benchmark	>10-<35% or >165-200% of benchmark	35-<75% or >125-165% of benchmark	75-125% of benchmark
Shrub cover				
Grass and grass like cover				
Forb cover				
Fern cover				
Other cover				
Total length of fallen logs	0-10%	>10-<50% of benchmark	50-<100% of benchmark	≥ benchmark
Litter cover	0-10% or >200% of benchmark	>10-<35% or >165-200% of benchmark	35-<75% or >125-165% of benchmark	75-125% of benchmark
Number of large trees	0-10%	>10-<50% of benchmark	50-<100% of benchmark	≥ benchmark

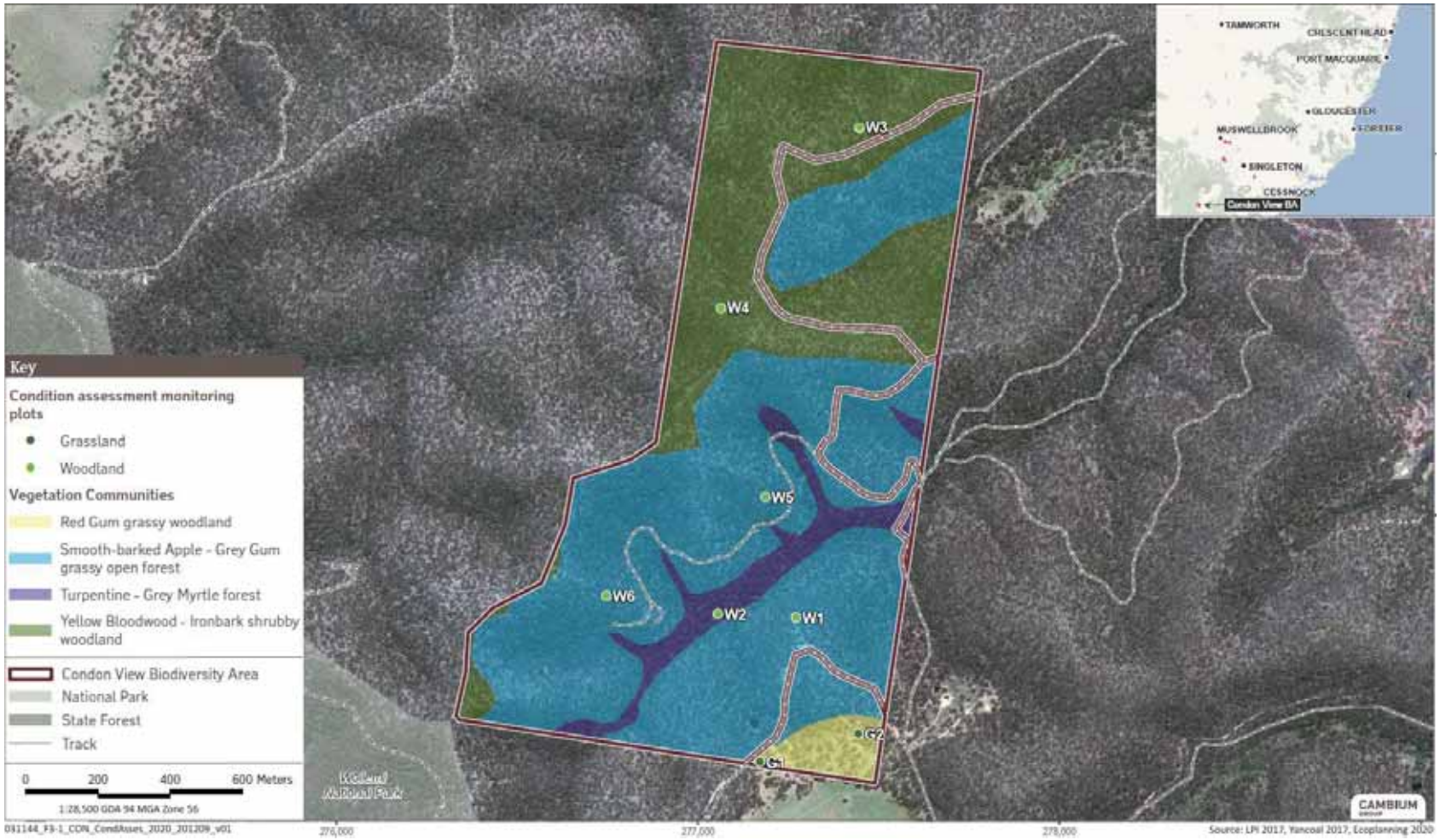

Figure 6.1. Condition assessment monitoring locations at the Condon View Biodiversity Area.

Table 6.4.Summary of plot data collected at Condon View and an assessment of relative condition.

Community Benchmark Category	PCT 1386			PCT 1622				PCT 1327			PCT 1282	
	BM[1]	G1	G2	BM[1]	W1	W5	W6	BM[1]	W3	W4	BM[1]	W2
Native Species Richness												
Tree richness	4	2	3	6	5	6	8	6	7	6	9	5
Shrub richness	8	1	0	22	5	10	10	22	15	15	15	14
Grass and grass like richness	8	14	9	9	12	11	10	9	9	10	6	5
Forb richness	8	20	17	9	12	13	14	9	11	10	8	20
Fern richness	2	1	0	2	0	1	1	2	0	0	5	2
Other richness	4	3	3	4	0	2	5	4	2	0	12	4
Native Foliage Cover (%)												
Tree cover	22	20	11	60	20	21	18.6	60	52.5	56	69	28.1
Shrub cover	22	0.1	0	56	2.3	5.2	7.4	56	9.7	4.2	51	36.7
Grass and grass like cover	70	47.4	45.8	23	4.3	1.6	1.8	23	9.1	17.1	7	55.2
Forb cover	3	8.4	9	6	1.3	1.5	2.1	6	1.3	1	4	24.1
Fern cover	1	0.1	0	0	0	0.1	0.1	0	0	0	14	0.6
Other cover	1	0.4	0.4	3	0	0.2	0.25	3	0.2	0	21	0.4
Other												
Total length of fallen logs	12	21.8	43.8	45	54	94.23	88	45	46.8	3	15	174
Litter cover	40	22.5	12	75	51.25	78.75	86.25	75	68.75	73.75	72	37
Number of large trees	1	4	1	3	4	0	2	3	4	3	3	1
Sum of score /45		25	23		23	24	30		32	26		21

BM = Benchmark

6.2.3 Bird assemblage monitoring

No bird assemblage monitoring was scheduled for the 2020 reporting period. With the extensive fires that occurred in the adjacent Wollomi National Park during 2019, an additional bird monitoring event was undertaken at the Condon View BA during 2020.

The bird surveys occurred in August 2020. The surveys were undertaken at eight 2 hectare sites as shown in figure 6.2. All birds seen, heard, observed or whose presence was evidenced by other means within and outside the search area were recorded.

Forty three bird species were recorded at the Condon View BA. One of the species recorded had a habitat preference for grassland/farmland, five were generalists, and 37 were woodland species which reflects the vegetation communities shown in figure 6.2. The numbers of birds recorded per site and the habitat preferences of birds observed within the survey is outlined in Table 6.5.

Table 6.5 reveals that the number of birds recorded inside the survey areas were higher than the number outside the survey areas.

Large, aggressive honeyeaters (Noisy Miner (*Manorina melanocephala*), Musk Lorikeet (*Glossopsitta concinna*), Noisy Friarbird (*Philemon corniculatus*), Red Wattlebird (*Anthochaera carunculata*)), which are known to disturb and harass Regent Honeyeater and Swift Parrot, were recorded at both open woodland sites (sites 1 and 8) and one woodland site (Site 3). Noisy Miner is a species common in modified open woodlands, farm land and ecotones between grassland and woodland, particularly where the shrub layer has been removed. The aggressive exclusion of birds from habitat by Noisy Miners is recognised as a key threatening process under the BC Act (NSW Scientific Committee 2013).

No Regent Honeyeaters or Swift Parrots were observed during the survey. However, four vulnerable species, *Melithreptus gularis gularis* (Black-chinned Honeyeater), *Callocephalon fimbriatum* (Gang Gang Cockatoo), *Glossopsitta pusilla* (Little Lorikeet) and *Pomatostomus temporalis temporalis* (Grey-crowned Babbler), listed under the NSW *Biodiversity Conservation Act 2016*, were recorded. The sites at which these species were recorded is in Table 6.6.

Table 6.5. Summary of the number of birds recorded at Condon View BA within and outside the survey area, and the habitat preferences of birds recorded in the survey area.

Site	Birds recorded within the survey area			Total birds recorded outside survey area	Incidentals	Total birds recorded
	Woodland birds	Grassland birds	Generalist birds			
G1	11	1	2	6	5	25
G2	10	0	1	2	6	19
W1	13	0	0	3	4	20
W2	11	0	0	2	0	13
W3	8	0	0	0	1	9
W4	8	0	1	7	5	21
W5	10	0	0	7	1	18
W6	9	0	1	8	2	20

Table 6.6. Sites at which threatened species were recorded at Condon View BA.

Species	Site							
	G1	G2	W1	W2	W3	W4	W5	W6
Melithreptus gularis gularis (Black-chinned Honeyeater)	X							
Callocephalon fimbriatum (Gang-gang Cockatoo)		X						
Pomatostomus temporalis temporalis (Grey-crowned Babbler)	X							
Glossopsitta pusilla (Little Lorikeet)	X		X	X		X	X	X

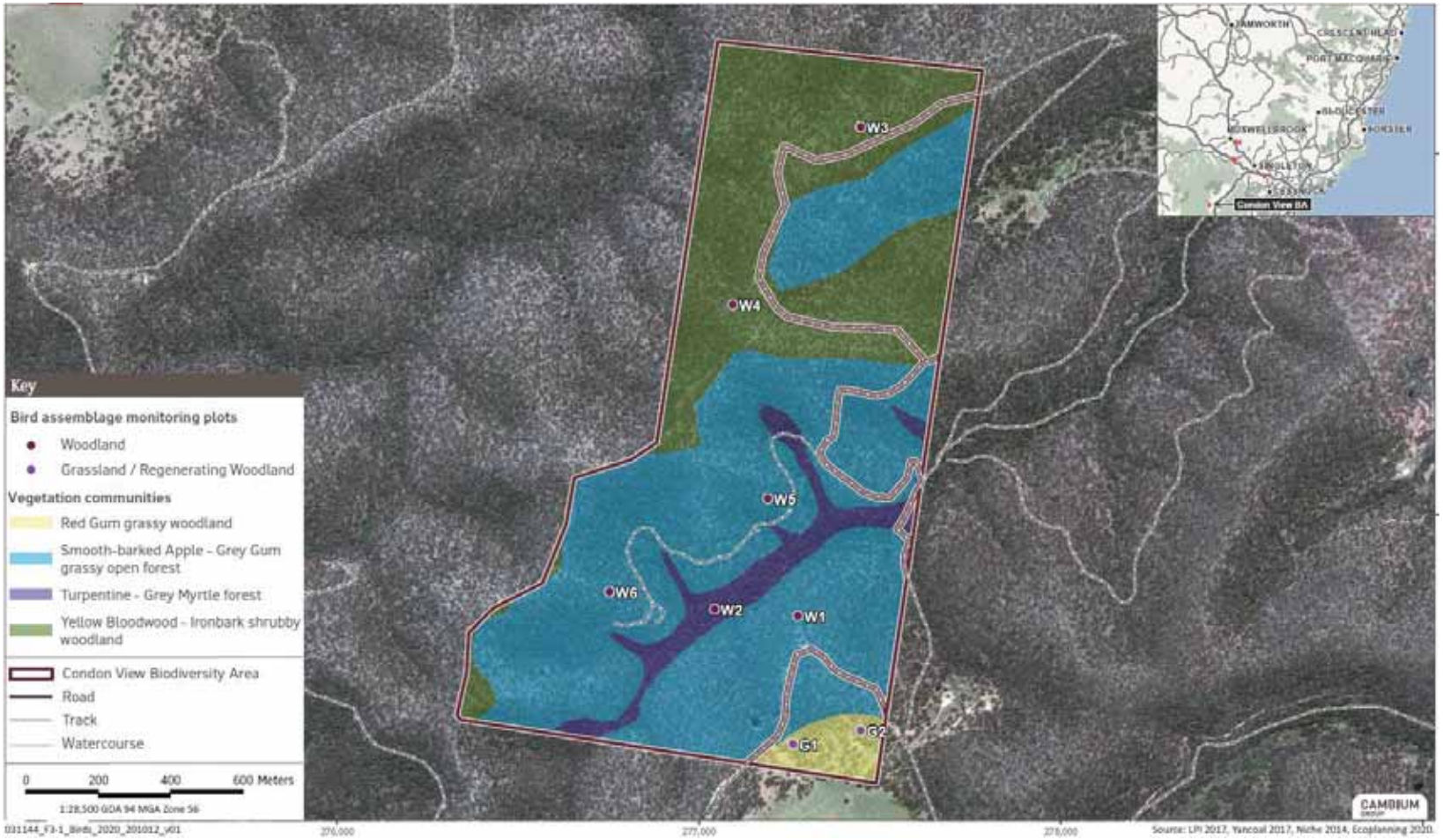

Figure 6.2. Bird assemblage monitoring locations at the Condon View Biodiversity Area.

Crescent Head BA

The Crescent Head BA was established to offset the impact to the Green and Golden Bell Frog (GGBF) and its habitat. The key performance measures to achieve this criteria measure:

- reduction in the exotic Mosquito Fish population in the ponds where possible,
- provision of suitable supplementary breeding habitat,
- maintenance of existing foraging habitat, and
- maintenance of connectivity between GGBF habitat components.

To achieve compliance with the supplementary habitat requirement, a pond and rainwater tank that is above the flood level to minimise the possibility of Mosquito Fish incursion was installed at both sites. This was discussed in Section 5.2.

Access tracks are being maintained in accordance with the management plan to comply with both the connectivity between GGBF habitat and the maintenance of existing foraging habitat performance measures.

In addition, investigations and monitoring occurred during this reporting period as outlined below.

6.2.4 Green and Golden Bell Frog Surveys

As reported in the previous compliance report, GGBF was observed during the March 2019 surveys adjacent to Pond A in Crescent Head North. Two sub-adult male individuals were found in separate *Philydrum lanuginosum* (Woolly Waterlily) that were growing on the southern margin of the pond within a few metres of each other.

The frequency at which GGBF are monitored is set out in the draft management plan. During the second year of monitoring (which extends from spring 2019 to autumn 2020) there was no scheduled monitoring of GGBF. However, very high rainfall in February 2020 created ideal conditions for surveying frogs, therefore, two nights of survey were included in the monitoring schedule targeting GGBF. As GGBF has previously been recorded at Crescent Head North, GGBF survey was only performed at Crescent Head South, where no sightings of GGBF have been recorded.

The survey methods used to detect GGBF were call detection, call playback, call imitation, spotlighting of banks and emergent vegetation and dip-netting for tadpoles (as part of Mosquito Fish monitoring).

Each pond at Crescent Head South was surveyed once per night. Incidental observations of frogs were also recorded, which included rapid survey at other ponded water and overland flows from which a frog chorus was heard during the survey.

A GGBF reference site near Ryan's Cut was surveyed once during the day and once at night to detect GGBF. GGBF responded to call play back on both occasions at the freshwater wetland behind the foredunes south of Ryan's Cut.

Unfortunately, no GGBF were recorded at Crescent Head South during the February 2020 surveys. Nine species of frog were recorded which included five frogs recorded at Crescent Head South for the first time: *Crinia signifera* (Common Eastern Froglet), *Litoria caerulea* (Australian Green Tree Frog), *Litoria gracilenta* (Dainty Green Tree Frog), *Litoria nasuta* (Striped Rocket Frog) and *Litoria tyleri* (Tyler's Tree Frog). Few frogs were recorded in the ponds, with most frogs being heard in overland flow in proximity to the ponds.

The reference site near Ryan's Cut contained large amounts of water and was in good condition, with large numbers of tadpoles likely to be GGBF observed. GGBF responded to call play back during the day and at night at Ryan's Cut. There was a high frog activity at night when the calls of several species were heard, and during call play back two GGBF individuals were heard calling.

6.2.5 Mosquito Fish Monitoring

The 2019 monitoring period (which extends from spring 2019 to autumn 2020) is the second year that monitoring of the mosquito fish within the ponds has occurred. Three inground ponds are being monitored at both sites along with the constructed pond at each site. The monitoring being reported in this reporting year only included the newly constructed ponds in the October survey due to their installation in August 2020.

Mosquito Fish was detected at Crescent Head North at Pond 1 and at all ponds at Crescent Head South. Due to dry conditions, Pond 2 and Pond 3 at Crescent Head North could not be sampled in either the October 2019 or the February 2020 field surveys.

The numbers of Mosquito Fish recorded have varied across the monitoring period, yet the factors that affect these changes have not been identified in the literature (MDBA 2011). The complete drying of a pond seems to be the most effective method of removing the species from a pond without applying chemicals. Pond 1 at Crescent Head North is fed by groundwater, so the use of a periodic drying cycle to remove the Mosquito Fish is unlikely to be achieveable.

With the exception of Pond 2 at Crescent Head North, native fish were present in all ponds that contained water in both offset sites during the October 2019 and February 2020 survey periods. The native species Firetail Gudgeon, which was recorded at Crescent Head North at Pond 1 and Crescent Head South at Ponds 1 and 2, is a known predator of GGBF tadpoles (Pyke and White 2000). Numbers of this species are relatively low, but will be examined in future monitoring periods.

Table 6.7. Cumulative Mosquito Fish Results from the monitoring to date.

Scientific name	Common Name	Crescent Head North														
		Pond 1					Pond 2					Pond 3				
		Oct -18	Mar -19	Oct -19	Feb -20	Oct -20	Oct -18	Mar -19[1]	Oct -19[1]	Feb -20	Oct -20	Oct -18[1]	Mar -19[1]	Oct -19[1]	Feb -20[1]	Oct -20[1]
Gambusia holbrooki	Mosquito Fish	10	67	97	261	304		-	-	-	-	-	-	-	-	-
Gobiomorphus australis	Striped Gudgeon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Gobiomorphus coxii	Cox's Gudgeon	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hypseleotris galii	Firetail Gudgeon	-	108	18	17	-	-	-	-	-	-	-	-	-	-	-
Paratya sp.	Freshwater Shrimp	P	-	P	P	P	-	-	-	-	-	-	-	-	-	-
Mixed	Tadpole	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-
	Crustaceans	-	-	-	-	P	P	-	-	-	-	-	-	-	-	-

[1] = denotes dry ephemeral pond/swamp at time of survey, P = present

Scientific name	Common Name	Crescent Head South														
		Pond 1					Pond 2					Pond 3				
		Oct -18	Mar -19	Oct -19	Feb -20	Oct -20	Oct -18	Mar -19	Oct -19	Feb -20	Oct -20	Oct -18	Mar -19	Oct -19	Feb -20[1]	Oct -20
Gambusia holbrooki	Mosquito Fish	43	30	69	315	1743	25	36	129	67	101	24	49	48	30	167
Gobiomorphus australis	Striped Gudgeon	-	1	-	X	-	-	-	-	X	-	-	-	-	-	-
Gobiomorphus coxii	Cox's Gudgeon	1	-	-	-	2	1	-	-	-	-	-	-	-	-	-
Hypseleotris galii	Firetail Gudgeon	3	19	7	3	1	5	4	3	1	4	-	2	1	-	1
Paratya sp.	Freshwater Shrimp	P	-	P	P	P	P	-	P	P	-	P	-	-	-	-
Mixed	Tadpole															

X = incidental record, P = present

Scientific name	Common Name	Crescent Head North	Crescent Head South
		Offline Pond	Offline Pond
		Oct-20	Oct-20
Gambusia holbrooki	Mosquito Fish	0	0

7 Vegetation Clearance Plan

The Vegetation Clearance Plan (VCP) was implemented following the Minister's approval of the Plan on 24 October 2016. The VCP provides for the effective implementation of measures to manage CHVEF, Regent Honeyeater, Swift Parrot and Green and Golden Bell Frog during the vegetation clearance for the approved action and was prepared to meet conditions 1, 2, 21 and 22 of EPBC 2016-7640.

Condition 1 of EPBC 2016/7640 states that HVO must not clear more than 54.4 ha of CHVEF from within the Riverview Pit EPBC boundary and 6.6 ha of CHVEF from within the West Pit EPBC boundary.

HVO has, in total, cleared 36.3 ha of CHVEF from Riverview Pit and 5.5 ha of CHVEF from West Pit. All vegetation clearing was restricted to within the State and Commonwealth approved project boundaries.

The VCP is initially managed through HVO's Ground Disturbance Permit process whereby pre-clearance checks and conditions are applied prior to any disturbance or on-ground works. Conditional approvals are applied to each permit which include specific requirements to comply with the surveys and processes outlined in the VCP.

No surveys have recorded the Regent Honeyeater, Swift Parrot or the Green and Golden Bell Frog (adults, metamorphs or tadpoles) as residing or traversing across the EPBC area.

More details are outlined in the compliance table in Section 2.

8 Native Fauna Captured on Camera

Figure 7.1. Male lyre bird, *Menura novaehollandiae*, captured on motion sensor camera at Condon View BA.

Figure 7.2. Female lyre bird, *Menura novaehollandiae*, captured on motion sensor camera at Condon View BA.

Figure 7.3. Brush tail possum, *Trichosaurus vulpecular*, captured on motion sensor camera at Hook BA.

Figure 7.4. Spotted quail thrush, *Cinclosoma punctatum*, captured on motion sensor camera at Condon View BA.

Figure 7.5. Yellow tufted honeyeater, *Lichenostomus melanops*, captured on motion sensor camera at Condon View BA.

Figure 7.6. Short- beaked echidna, *Tachyglossus aculeatus*, captured on motion sensor camera at Mitchelhill East BA.

Figure 7.7. Long nosed bandicoot, *Perameles nasuta*, captured on motion sensor camera at Mitchelhill East BA.

9 References

Department of Environment and Climate Change (DECC) (2008), *Best practice guidelines for the Green and Golden Bell Frog*, Department of Environment and Climate Change MSW, Sydney.

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Appendix A - Residual Impact: Wetland Mapping Project Report

Report to accompany Green and Golden Bell Frog Wetland Mapping at the Crescent Head Study Area.

Prepared by North Coast Aerial Mapping (NCAM), October 2020

Background

The NSW Department of Planning, Industry and Environment (The Department; Environment, Energy and Science Group, EES, Biodiversity and Conservation Division, BCD) was contacted in early 2019 by a mining company, Hunter Valley Operations (HVO), about research or education projects it could fund for the Green and Golden Bell Frog (GGBF). HVO had a small, residual Commonwealth offset requirement for GGBF that was not met through the purchase of offset sites. The residual offset was to be spent on a research or education project, as approved by the Commonwealth Department of Agriculture, Water, and the Environment. BCD suggested a number of research projects to HVO that could be undertaken to benefit GGBF, including a habitat mapping project for GGBF at Crescent Head. The Department of Agriculture, Water, and the Environment approved HVO's residual offset be spent on GGBF habitat mapping in November 2019.

Little is known about the GGBF population at Crescent Head. Habitat mapping could inform where GGBF could persist in the Crescent Head area and potentially indicate how large a population could be present. It could identify the extent of available habitat in relation to barriers in the landscape that could impede GGBF movement. Further, it could inform management actions and strategic planning in the area, particularly if specific types of GGBF habitat e.g. breeding and refuge habitat, could be identified at the lot scale for targeted management.

The first step in the GGBF habitat mapping project is to undertake wetland mapping via aerial photo interpretation. Existing wetland mapping covers the Crescent Head area, and BCD previously produced a composite wetland mapping layer for the purposes of calculating the extent of wetlands around GGBF monitoring wetlands at the Crescent Head *Saving our Species* management site. However, existing wetland mapping, including the composite wetland mapping layer, was very broad, and in many cases inaccurately demarcated wetlands or missed wetlands. Therefore, new linework for wetlands was required prior to GGBF habitat mapping.

NCAM was contracted by BCD to prepare the updated wetland and water features map within the study area utilising both 2009 ADS40 3D imagery and the higher-resolution 2014 ADS100 3D imagery, with reference to 2020 Google Earth 2D imagery. Use was made of existing vegetation mapping produced by both Kempsey Shire Council and The Department's Science Division to minimise the replication of existing, valid linework for wetlands.

Scope of Works

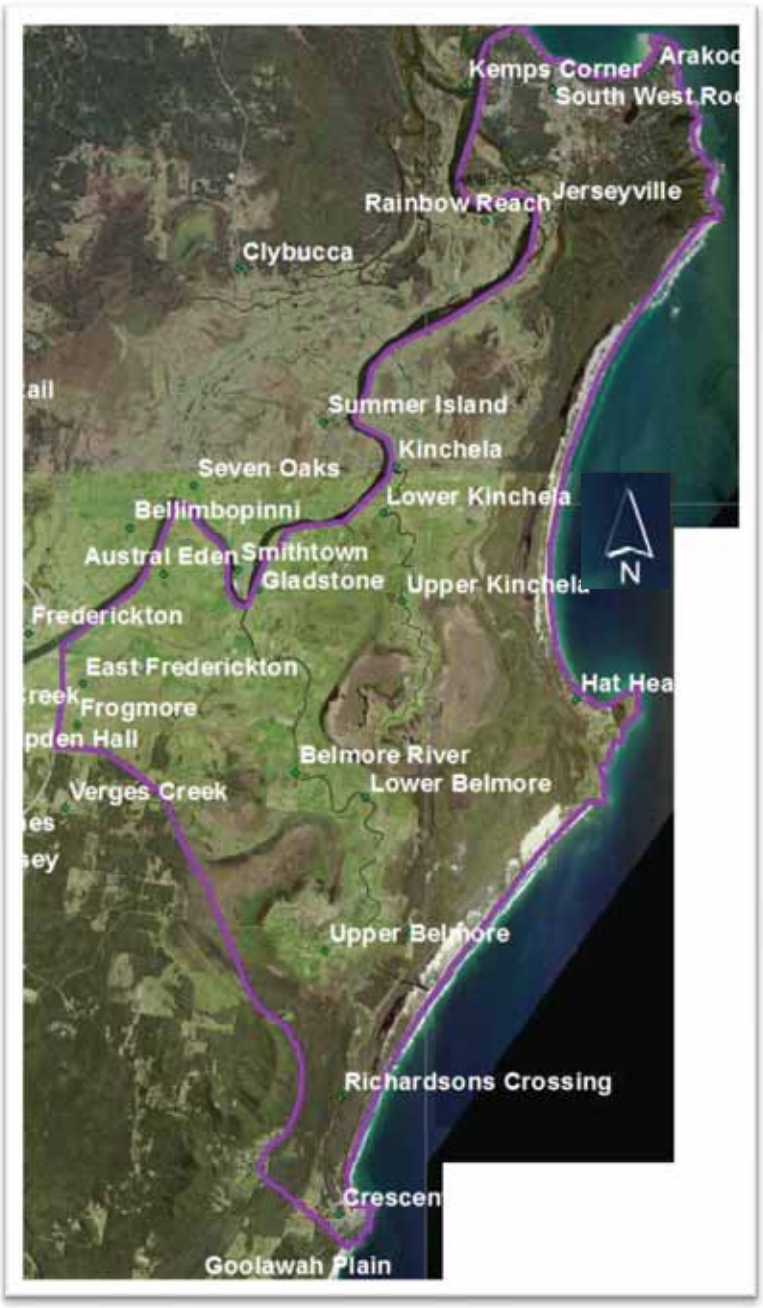
The scope of works included:

- Preparing an ArcGIS feature class of all wetlands and water features not previously captured by the *Strahler Stream Order* spatial layer using 2009 ADS40 and 2014 ADS100 imagery (supplied by The Department's data broker) within the study area using existing vegetation mapping products as the base for the wetland layer. The minimum polygon size will be 100 m^2 (0.01 ha) and minimum lineal width approximately 10 m. However in some cases the polygon will delineate features narrower than this – particularly when a water feature forms part of a larger waterbody.
- Attributing the feature class with a descriptive code that will nominate the type of water feature captured and will also be given an API confidence score between 1- 4.
- Capturing the outer most limit of identifiable water features from the imagery. This process will be enabled by capturing water features in 3D on the wetter, 2009 imagery, whilst simultaneously transposing the polygons to the drier 2014 2D ADS100 imagery. Use of the wetter imagery will likely lead to capturing water features at or near their maximum extent. A second stage of interpretation will also be included after the digitising is complete and will involve a visual check of the expansion or contraction of wetlands using 2020 Google Earth imagery. Any wetlands that have been irreversibly lost due to land use changes since 2014, including losses due to development, will be deleted from the wetland feature class. Please note, this process does not include deletion of dynamic wetland features that may not be clearly visible from the 2020 Google Earth imagery due to drier conditions. Areas of wetland that have expanded will have the outer boundary expanded to approximately match.
- Adding new wetlands/waterbodies to the feature class constructed after 2014 (which would not have appeared in 2009 and 2014 imagery).
- Preparing a report that summarises project methodology, results, and any interpretations and recommendations from analysis.

Study Area

The study area identified by BCD covers approximately 43,000 ha. It stretches between South West Rocks in the north and Crescent Head in the south, and is bound by the coast in the east, and the Macleay River in the west (Figure 1). It includes the majority of the Belmore and Kinchela Creek catchments, and contains a number of large ephemeral swamps, forested land, and agricultural areas.

Figure 1: Study Area in purple



Methods

There were a number of steps involved in the preparation of the final wetlands dataset. The steps were:

1. preparing a wetland base layer from existing vegetation datasets. This involved extracting wetland polygons from the existing vegetation datasets, and then adding and deleting wetlands polygons, or modifying wetland polygon boundaries to better capture the outer

limit of polygons, based on inspection of 2009 ADS40 3D imagery and 2014 ADS100 3D imagery.

2. attributing wetland polygons in the wetland base layer based on inspection of 2009 ADS40 3D imagery and 2014 ADS100 3D imagery.
3. reviewing wetland polygons identified through 3D imagery against 2D Google Earth images to assess any expansion in mapped wetlands and to add any new wetlands/waterbodies constructed after 2014 (which would not have appeared in 2009 and 2014 imagery) to the feature class.

Existing vegetation datasets were used to prepare a wetland base layer as the Crescent Head study area is large, and existing datasets already covered the study area; there was no need for wetlands to be re-captured.

The steps to prepare the final wetlands dataset are expanded upon in the following sections.

Preparing the wetlands base layer

The existing vegetation mapping products that were used and included in the final mapping product were the state-wide PCT map produced by The Department (Science Division), and the LGA-wide PCT map produced by Kempsey Shire Council. The state-wide PCT map was used for land within public land tenure (Hat Head and Arakoon National Parks), while the LGA-wide PCT map of Kempsey Shire Council was used for remaining land in the study area. The state-wide and LGA-wide PCT maps were captured at approximately 1:15,000 and 1:2,000 scale, respectively.

In preparing the base layer, the two datasets were first sorted by vegetation formation in their respective attribute tables. Non-wetland types were deleted from the datasets. The two datasets were then clipped for their relevant areas, with the residual portions of the two datasets merged and joined at the National Park boundary to form a seamless polygon layer.

Once a seamless polygon layer was produced, boundaries of wetland polygons were inspected against 2009 ADS40 3D imagery and 2014 ADS100 3D imagery. Based on what was observed, some wetland polygons were deleted. New digital linework was made between existing wetland polygons and also internally within these existing polygons where canals or dams were evident. In many cases, original polygon boundaries were modified to more accurately capture the outer most limit of wetlands. All changes to wetland polygons were performed at a 1:500 scale to ensure the accurate delineation of water and wetland boundaries.

Use was made of the Strahler Stream Order (SSO) dataset to guide interpretation of linear water features. Many of the mapped SSO drainage features were not visible on the imagery, however where they were visible and within project specifications, the SSO layer was a useful tool to aid interpretation.

Attributing wetlands polygons

The existing polygons, including modified polygons, and all new interpreted wetland and water feature polygons that had been captured and included in the wetlands base layer were assigned attributes using API in accordance with the project specifications.

Project Specifications

BCD indicated that there were several descriptive data fields that were important features to capture within each polygon. These included:

- *Water status* – i.e. permanent water body or ephemeral.
- *Waterbody type/feature* – for example dam, river, canal.
- *Vegetation Margin* – used to identify whether there is vegetation surrounding the water feature.
- Differentiation of *salt water* polygons from *fresh water* areas.
- In addition NCAM recommended capturing the *structural characteristics* of the wetland as it was beyond the scope of the project to nominate a vegetation community type. For example woody wetland, non-woody wetland.
- *Confidence score* – ranked between 1 and 4. Provides the map user with an understanding of the perceived level of reliability of the data.
-

Table 1 – polygon attributes

Water_Feature	Vegetation_Margin	Wetland	Water_Status	Salt_or_Fresh	Confidence
Dam_or_Pond	Veg_Margin	Woody	Ephemeral	Salt_Water	1
Canal	No_Veg	Non_Woody	Permanent	Fresh_Water	2
River		Saltmarsh_Mangrove			3
Wetland					4

Attribute Descriptions

Water_Feature: describes the physical characteristics of the water feature or wetland. Where 'Wetland' is selected the 'Vegetation Margin' defaults to NULL (the wetland is inherently vegetated so there is no need to describe the surrounding landscape).

- **Dam_or_Pond:** generally used to describe artificial water bodies. In some cases could include natural water bodies that have been modified to capture water.
- **Canal:** generally used to describe artificial linear drainage features. In some cases canals will adjoin a natural watercourse and the boundary can become difficult to distinguish.
- **River:** describes large water bodies including rivers, estuaries and natural watercourses. Generally attributed as salt which may include brackish water or in some cases misinterpreted freshwater.
- **Wetland:** describes natural water bodies.

Vegetation_Margin: used to capture vegetation within or adjacent to a water feature that would otherwise be too small to map accurately i.e. below project specification. For example this field can describe whether there is aquatic or riparian vegetation present in a small farm dam or adjacent to a very narrow drainage canal. The adjacent vegetation is included in the water feature polygon and

because it is narrow would not be otherwise captured. NCAM understands this is potentially an important habitat feature for the GGBF.

Wetland: where 'wetland' was selected in the 'Water_Feature' field, this code can be used to describe the structural characteristics of the wetland. This code provides BCD with a broad understanding of the wetland type (without nominating a vegetation community type). Wetlands can broadly be described as woody, non-woody and a complex of mangrove and saltmarsh in estuarine areas.

Water_Status: a subjective attempt at capturing the likelihood that the water feature or wetland is either permanent or ephemeral. As a general rule if there was water visible in the imagery it was more likely to be permanent. Uncertainty using this field could lead to a lower API confidence score.

Salt_or_Fresh: an attempt to assign the likelihood that the water feature or wetland is either salt or fresh.

Confidence_Code: A confidence code was assigned to provide the map user with an appreciation of interpreter confidence for one or more of the various attributes captured. As discussed above there was a degree of uncertainty surrounding the persistence of water within a water feature as well as salinity levels. There was also uncertainty encountered with the actual interpretation of the vegetation patterns in the imagery (example in Figure 2 below). This is discussed in the limitations section of the report. A confidence score is provided for each polygon rather than each attribute within a polygon.

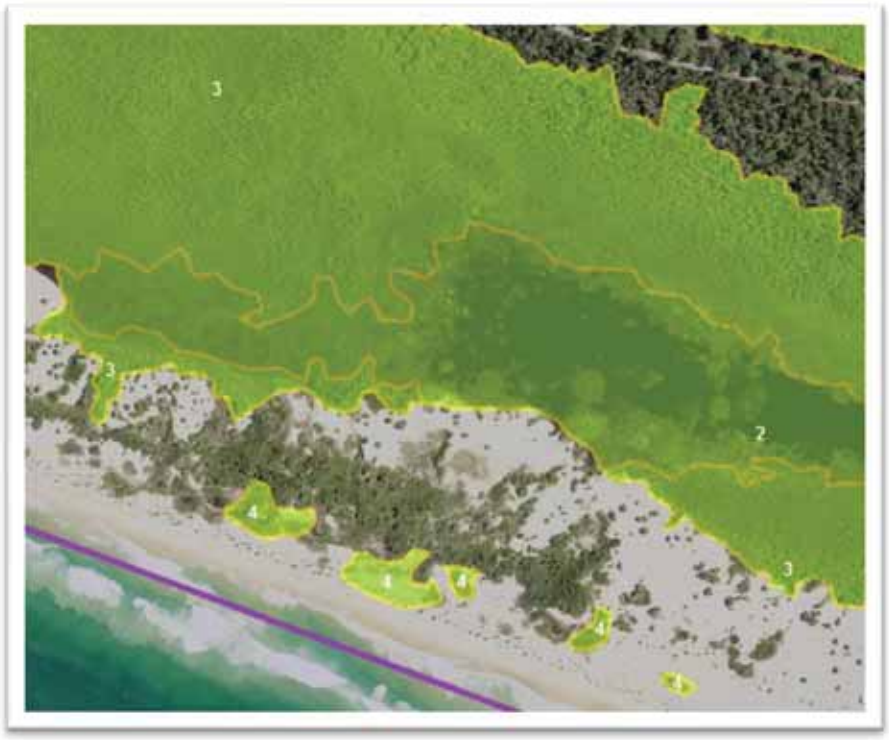
1=confident interpretation,

2=some level of uncertainty,

3=used to indicate uncertainty with the State-wide PCT polygons or where there is a degree of uncertainty when attributing the water permanence or saline levels.

4=low level of confidence in attribution and/or delineation of polygon boundaries.

Figure 2: Example of confidence coding



In the example above:

- confidence code = 2 for a readily identified non-woody wetland in a freshwater environment. Polygon boundary is reasonable.
- confidence code = 3 for woody wetlands that have coarse boundaries and may have smaller areas of non-woody wetlands within the polygon.
- confidence code = 4 for non-woody freshwater wetlands in perched sandy wetlands. Boundaries do not appear to be accurate, due partly to the dynamic nature of the dunes.

Reviewing wetland polygons against recent 2D imagery

Following the attribution of wetland polygons, all wetland polygons captured from the 3D ADS40 and ADS100 imagery were compared to a 2D Google Earth image to assess any expansion or contraction in mapped wetlands. This involved converting the Esri shapefile to a .KML file. The Google Earth imagery was captured in April 2020 and therefore provided an opportunity to review polygons against recent imagery, that would not have been present in the 2014 ADS100 imagery.

A number of water features were added to the final map during this process as a result of rectification drainage works in canals and farm dams. No water features were removed.

Results

The total area of water features captured by this project was 11, 176ha. This was represented within 1101 polygons.

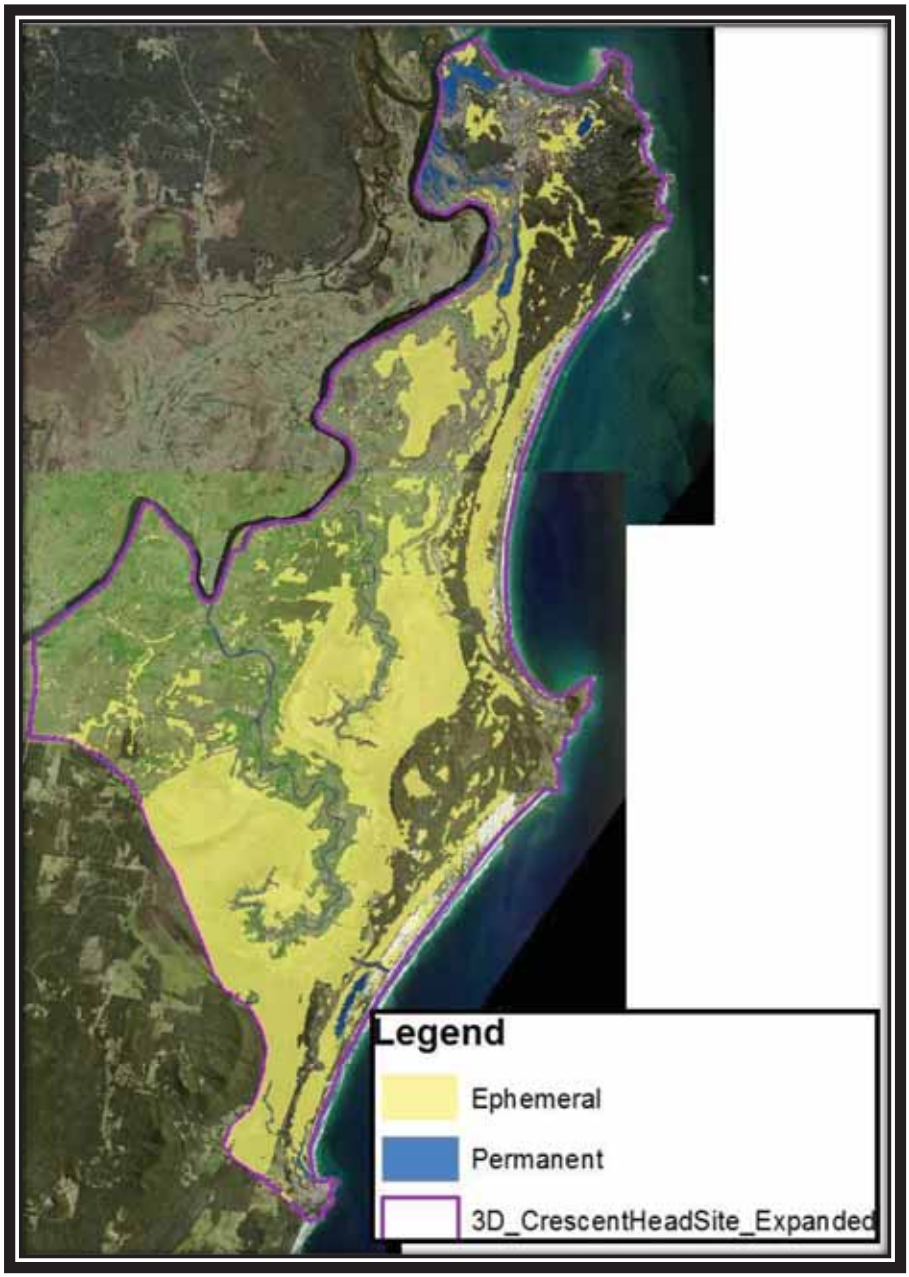
Changes to wetland polygon boundaries that were made included changes that resulted from natural shifts in wetlands in the dynamic sand dune system within Hat Head National Park. In Figure

3 below, the smaller areas of mapped wetland (light green) were increased to the more extensive area of wetland (grey).

Figure 3: Example of increase in wetland features in the dynamic sand dune system within Hat Head National Park following Google Earth review

The extent of wetlands in the final wetlands layer is shown below in Figure 4. Wetlands are represented in Figure 4 as ephemeral and permanent wetlands.

Figure 4: Final wetlands map



Limitations

- The project was captured using 3D imagery to ensure accurate capture of water feature boundaries and to differentiate vegetation types. The ADS imagery used was captured in 2009 and 2014. More recent 3D imagery would have negated the need to review against contemporary 2D imagery.
- Water feature boundaries were manually captured at a fine scale of approximately 1:500. There may be examples where the digitised boundaries deviate several metres from the wetland edge on the image due to human error, however the resolution of the map is sufficient to allow use at 1:1000.

- A confidence score of '1' was only used in situations where the water body was considered to be permanent, e.g. river, and where the water feature was clearly recognisable, e.g. farm dam. In some areas there was an inconsistency in the identification of some linear wetland types and canals as it is difficult to determine if the feature is natural or constructed.
- The existing state-wide PCT mapping is coarse and required modification in places to more accurately follow water feature boundaries. The state-wide PCT mapping was only included within Hat Head and Arakoon National Parks.
- There is a zone of vegetation in the dynamic fringe of waterbodies in low lying areas or low depressions in the landscape which respond to water availability and hence can be in a state of contraction or expansion depending on rainfall. These various states can be assessed on the imagery as a distinct photo pattern, however it may be arguable whether some of these vegetation communities constitute wetlands. This may not matter for the purposes of this study as the water and wetland features will be buffered, however it would be ideal to ground truth some of these areas with a wetlands specialist and determine their identification and significance. The boom and bust cycle of these dynamic wetland species may take place over a period of only a few months.

Recommendations

- BCD could introduce a density code plus a split between the saltmarsh and mangrove type in any future mapping.
- BCD could make enquiries about the availability of the next available ADS40/100 image and program a review of this dataset to improve the mapping.

Appendix B -Rapid Condition Assessment: Locations and Tables

Hunter Valley Operations

Rapid Condition Assessment locations at Crescent Head North Biodiversity Area

Monitoring Program 2020

Figure 1

031144_F1_RCA_CRE-S_2020_201117_v01

Source: Google Earth, LPI 2017, Yancoal 2017, Cambium Group 2020

Hunter Valley Operations

Rapid Condition Assessment locations at Crescent Head South Biodiversity Area

Monitoring Program 2020

Figure 2

031144_F2_RCA_CRE-S_2020_201117_v01

Source: Google Earth, LPI 2017, Yancoal 2017, Cambium Group 2020

Rapid Condition Assessment - Woodland

Hunter Valley Operations

Crescent Head Biodiversity Area

October 2020

Auditor: Cambium Group (Emilie Mascarenhas)

Note: True = 1, False = 0

Site ID	CRE-S R1	CRE-S R2	CRE-S R3	CRE-S R4	CRE-N R1	CRE-N R2	CRE-N R3	CRE-N R4
Low grazing intensity - never farmed	1	1	1	1	1	1	1	1
Tree and shrub regeneration present (<2m)	1	1	1	1	1	1	1	1
Infrequent fire regime (<5year intervals)	1	1	1	1	1	1	1	1
Healthy mature trees (no dieback)	1	1	1	1	1	1	1	1
Little to no evidence of rabbits	1	1	1	1	1	1	1	1
Little to no evidence of foxes/cats	1	1	1	1	1	1	1	1
Low abundance of weeds (most remnants contain some weeds)	1	1	1	1	1	1	1	1
No evidence of firewood collection	1	1	1	1	1	1	1	1
No obvious signs of erosion or salinity	1	1	1	1	1	1	1	1
Not susceptible to fertiliser application, herbicide or pesticide drift	1	1	1	1	1	1	1	1
Less than 20% trees with Mistletoe (NB some mistletoe is healthy)	1	1	1	1	1	1	1	1
Few tracks, trails or fence lines	1	1	1	1	1	1	1	1
Presence of native shrubs	1	1	1	1	1	1	1	1
Presence of large, old growth trees with hollows	0	0	0	0	0	0	0	1
Dead timber is left standing	1	1	1	1	1	1	1	1
Fallen timber and logs are left on the ground	0	0	1	1	1	1	1	1
Abundance of native ground flora	1	1	1	1	1	1	1	1
Presence of litter, cryptogams, cracks and rocks	1	1	1	1	1	1	1	1
Remnant is large (> 5ha is optimum)	1	1	1	1	1	1	1	1
Connected to or in close proximity to other remnant vegetation	1	1	1	1	1	1	1	1
Health Rating	**18**	**18**	**19**	**19**	**19**	**19**	**19**	**20**

Hunter Valley Operations

Rapid Condition Assessment locations at Mitchell Hill West Biodiversity Area

Monitoring Program 2020

Figure 3

031144_F3_RCA_MIT-W_2020_201117_v01

Source: LPI 2017, Yancoal 2017, Cambium Group 2020

Rapid Condition Assessment - Woodland

Hunter Valley Operations

Mitchelhill (West) Biodiversity Area

November 2020

Auditor: Cambium Group (Emilie Mascarenhas)

Note: True = 1, False = 0

Site ID	MIT-W R1	MIT-W R2	MIT-W R3	MIT-W R4	MIT-W R5	MIT-W R6
Low grazing intensity - never farmed	Grassland	1	1	1	1	Grassland
Tree and shrub regeneration present (<2m)		1	1	1	1	
Infrequent fire regime (<5year intervals)		1	1	1	1	
Healthy mature trees (no dieback)		1	1	1	1	
Little to no evidence of rabbits		1	1	1	1	
Little to no evidence of foxes/cats		1	1	1	1	
Low abundance of weeds (most remnants contain some weeds)		0	1	1	1	
No evidence of firewood collection		1	1	1	1	
No obvious signs of erosion or salinity		1	1	1	1	
Not susceptible to fertiliser application, herbicide or pesticide drift		1	1	1	1	
Less than 20% trees with Mistletoe (NB some mistletoe is healthy)		1	1	1	1	
Few tracks, trails or fence lines		1	1	1	1	
Presence of native shrubs		0	1	0	1	
Presence of large, old growth trees with hollows		0	1	1	1	
Dead timber is left standing		1	1	1	1	
Fallen timber and logs are left on the ground		1	1	1	1	
Abundance of native ground flora		1	1	1	1	
Presence of litter, cryptogams, cracks and rocks		1	1	1	1	
Remnant is large (> 5ha is optimum)		1	1	1	1	
Connected to or in close proximity to other remnant vegetation		1	1	1	1	
Health Rating		**17**	**20**	**19**	**20**	

Rapid Condition Assessment locations at Mitchell Hill East Biodiversity Area

Monitoring Program 2020

Figure 4

Rapid Condition Assessment - Woodland

Hunter Valley Operations

Mitchelhill (East) Biodiversity Area

November 2020

Auditor: Cambium Group (Emilie Mascarenhas)

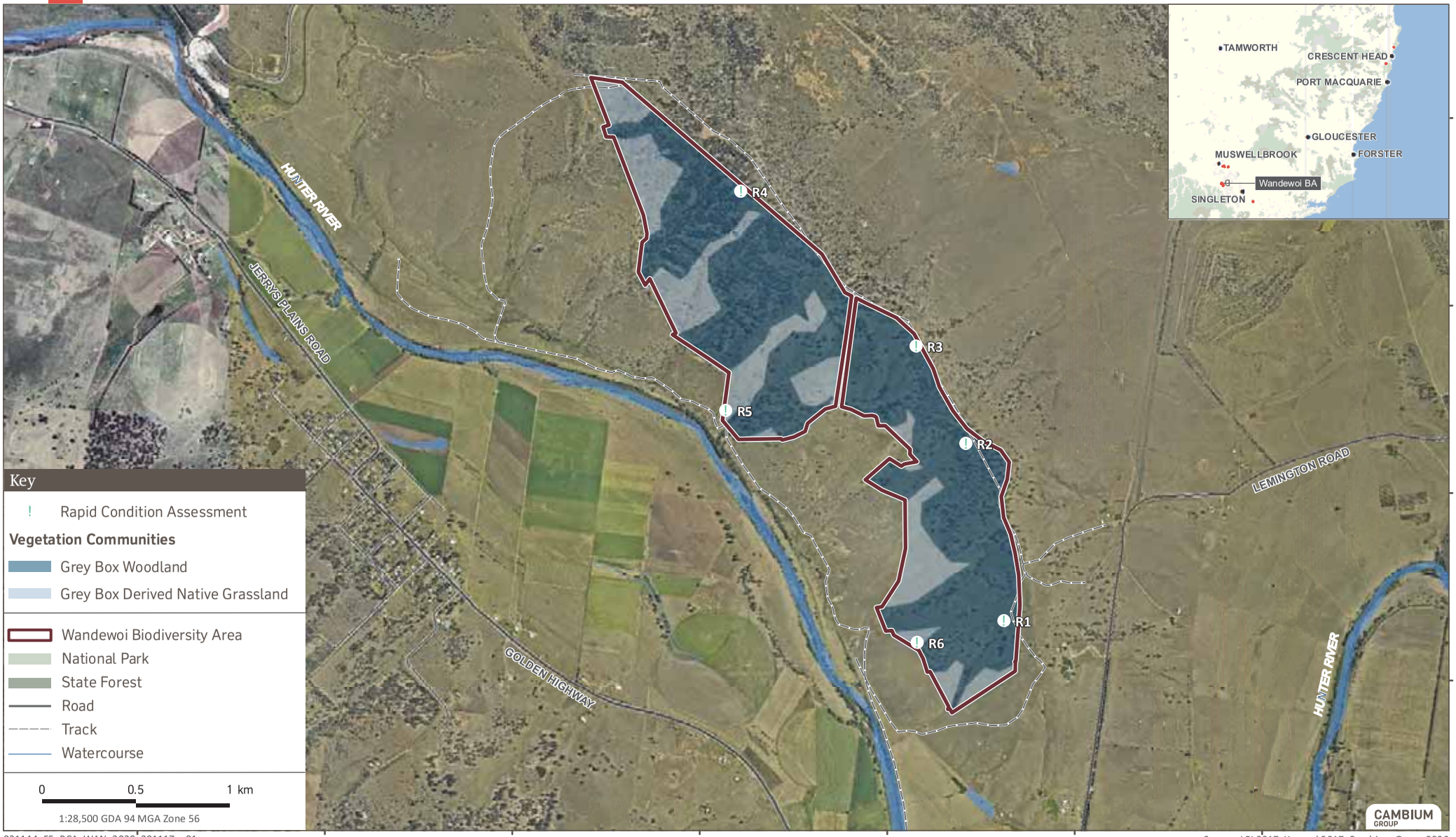
Note: True = 1, False = 0

Site ID	MIT-E R1	MIT-E R2	MIT-E R3	MIT-E R4	MIT-E R5	MIT-E R6
Low grazing intensity - never farmed	Grassland	1	0	Grassland	0	0
Tree and shrub regeneration present (<2m)		1	1		1	1
Infrequent fire regime (<5year intervals)		1	1		1	1
Healthy mature trees (no dieback)		1	1		1	1
Little to no evidence of rabbits		1	1		1	1
Little to no evidence of foxes/cats		1	1		1	1
Low abundance of weeds (most remnants contain some weeds)		1	0		0	0
No evidence of firewood collection		1	1		1	1
No obvious signs of erosion or salinity		1	1		1	1
Not susceptible to fertiliser application, herbicide or pesticide drift		1	1		1	1
Less than 20% trees with Mistletoe (NB some mistletoe is healthy)		1	1		1	1
Few tracks, trails or fence lines		1	1		1	1
Presence of native shrubs		1	1		1	1
Presence of large, old growth trees with hollows		0	0		0	1
Dead timber is left standing		1	1		1	1
Fallen timber and logs are left on the ground		1	1		0	1
Abundance of native ground flora		1	1		1	1
Presence of litter, cryptogams, cracks and rocks		1	1		0	0
Remnant is large (> 5ha is optimum)		1	1		1	1
Connected to or in close proximity to other remnant vegetation		1	1		1	1
Health Rating		**19**	**17**		**15**	**17**

Rapid Condition Assessment locations at Wandewoi Biodiversity Area

Monitoring Program 2020

Figure 5



Rapid Condition Assessment - Woodland

Hunter Valley Operations

Wandewoi Biodiversity Area

November 2020

Auditor: Cambium Group (Emilie Mascarenhas)

Note: True = 1, False = 0

Site ID	WAN R1	WAN R2	WAN R3	WAN R4	WAN R5	WAN R6
Low grazing intensity - never farmed	0	0	0	0	Grassland	Grassland
Tree and shrub regeneration present (<2m)	0	1	1	1		
Infrequent fire regime (<5year intervals)	1	1	1	1		
Healthy mature trees (no dieback)	1	0	1	1		
Little to no evidence of rabbits	1	1	1	1		
Little to no evidence of foxes/cats	1	1	1	1		
Low abundance of weeds (most remnants contain some weeds)	0	0	0	1		
No evidence of firewood collection	1	1	1	1		
No obvious signs of erosion or salinity	1	1	1	1		
Not susceptible to fertiliser application, herbicide or pesticide drift	1	1	1	1		
Less than 20% trees with Mistletoe (NB some mistletoe is healthy)	1	1	1	1		
Few tracks, trails or fence lines	1	1	1	1		
Presence of native shrubs	0	1	1	1		
Presence of large, old growth trees with hollows	1	0	1	1		
Dead timber is left standing	1	1	1	1		
Fallen timber and logs are left on the ground	1	1	1	1		
Abundance of native ground flora	0	0	0	1		
Presence of litter, cryptogams, cracks and rocks	1	1	1	1		
Remnant is large (> 5ha is optimum)	1	1	1	1		
Connected to or in close proximity to other remnant vegetation	1	1	1	1		
Health Rating	**15**	**15**	**17**	**19**		

Rapid Condition Assessment locations at Hook Biodiversity Area

Monitoring Program 2020

Figure 6

031144_F6_RCA_HOO_2020_201117_v01

Source: LPI 2017, Yancoal 2017, Cambium Group 2020

Rapid Condition Assessment - Woodland

Hunter Valley Operations

Hook Biodiversity Area

November 2020

Auditor: Cambium Group (Emilie Mascarenhas)

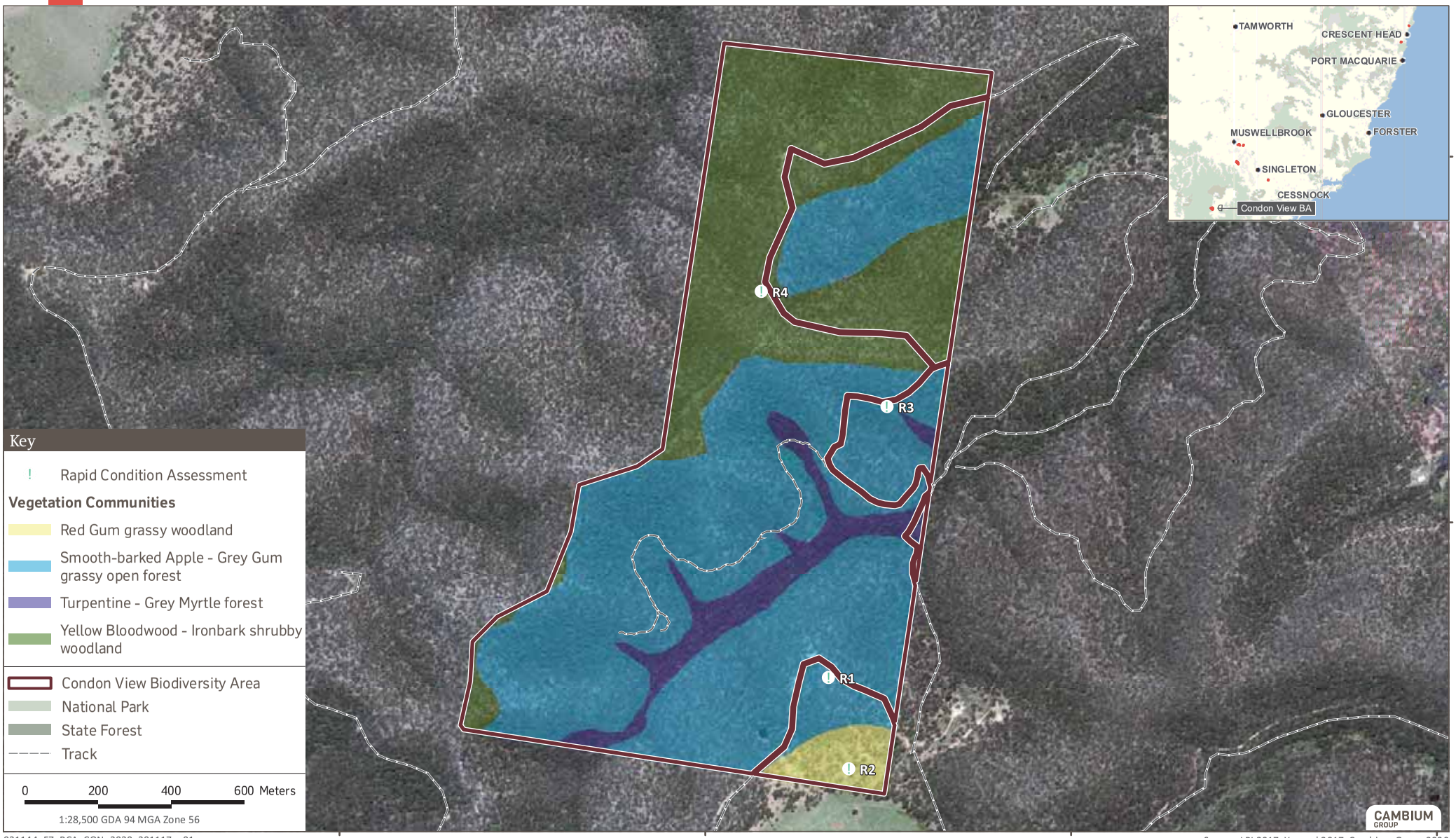
Note: True = 1, False = 0

Site ID	HOO R1	HOO R2	HOO R3	HOO R4	HOO R5	HOO R6
Low grazing intensity - never farmed	0	1	1	1	1	1
Tree and shrub regeneration present (<2m)	1	1	1	1	1	1
Infrequent fire regime (<5year intervals)	1	1	1	1	1	1
Healthy mature trees (no dieback)	1	1	1	1	1	1
Little to no evidence of rabbits	1	1	1	1	1	1
Little to no evidence of foxes/cats	1	1	1	1	1	1
Low abundance of weeds (most remnants contain some weeds)	0	1	0	1	1	1
No evidence of firewood collection	1	1	1	1	1	1
No obvious signs of erosion or salinity	1	1	1	1	1	1
Not susceptible to fertiliser application, herbicide or pesticide drift	1	1	1	1	1	1
Less than 20% trees with Mistletoe (NB some mistletoe is healthy)	1	1	1	1	1	1
Few tracks, trails or fence lines	1	1	1	1	1	1
Presence of native shrubs	1	1	1	1	1	1
Presence of large, old growth trees with hollows	0	0	0	0	1	1
Dead timber is left standing	1	1	1	1	1	1
Fallen timber and logs are left on the ground	0	1	1	1	1	1
Abundance of native ground flora	1	1	1	1	1	1
Presence of litter, cryptogams, cracks and rocks	1	1	1	1	1	1
Remnant is large (> 5ha is optimum)	1	1	1	1	1	1
Connected to or in close proximity to other remnant vegetation	1	1	1	1	1	1
Health Rating	**16**	**19**	**18**	**19**	**20**	**20**

Rapid Condition Assessment locations at Condon View Biodiversity Area

Monitoring Program 2020

Figure 7



031144_F7_RCA_CON_2020_201117_v01

Source: LPI 2017, Yancoal 2017, Cambium Group 2020

Rapid Condition Assessment - Woodland

Hunter Valley Operations

Condon View Biodiversity Area

November 2020

Auditor: Cambium Group (Emilie Mascarenhas)

Note: True = 1, False = 0

Site ID*	CON R1	CON R2	CON R3	CON R4
Low grazing intensity - never farmed	1	0	1	1
Tree and shrub regeneration present (<2m)	1	1	1	1
Infrequent fire regime (<5year intervals)	1	1	1	1
Healthy mature trees (no dieback)	1	1	1	1
Little to no evidence of rabbits	1	1	1	1
Little to no evidence of foxes/cats	1	1	1	1
Low abundance of weeds (most remnants contain some weeds)	1	0	1	1
No evidence of firewood collection	1	1	1	1
No obvious signs of erosion or salinity	1	1	1	1
Not susceptible to fertiliser application, herbicide or pesticide drift	1	1	1	1
Less than 20% trees with Mistletoe (NB some mistletoe is healthy)	1	1	1	1
Few tracks, trails or fence lines	1	1	1	1
Presence of native shrubs	1	0	1	1
Presence of large, old growth trees with hollows	1	0	0	1
Dead timber is left standing	1	1	1	1
Fallen timber and logs are left on the ground	1	1	1	1
Abundance of native ground flora	1	0	1	1
Presence of litter, cryptogams, cracks and rocks	1	1	1	1
Remnant is large (> 5ha is optimum)	1	1	1	1
Connected to or in close proximity to other remnant vegetation	1	1	1	1
Health Rating	**20**	**15**	**19**	**20**

*R1 (HVO) = R1 (Yancoal), R2 = new site, R3 (HVO) = R5 (Yancoal), R4 (HVO) = R6 (Yancoal)