HUNTER VALLEY
OPERATIONS

HOOK BIODIVERSITY AREA MANAGEMENT PLAN

DOCUMENT NUMBER
HVOOC-1797567310-5424

STATUS
Final

DCCEEW VERSION NUMBER
5.0

HVO VERSION NUMBER
1.0

EFFECTIVE
18/12/2024

REVIEW
18/12/2027

OWNER
Hunter Valley Operations

Declaration of accuracy

I declare that:

1. To the best of my knowledge, all the information contained in, or accompanying this Biodiversity Area Management Plan is complete, current and correct.

2. I am duly authorised to sign this declaration on behalf of the approval holder.

3. I am aware that:

a. Section 490 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) makes it an offence for an approval holder to provide information in response to an approval condition where the person is reckless as to whether the information is false or misleading.

b. Section 491 of the EPBC Act makes it an offence for a person to provide information or documents to specified persons who are known by the person to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth) where the person knows the information or document is false or misleading.

c. The above offences are punishable on conviction by imprisonment, a fine or both.

Signed

MICHAEL LLOYD

(Environment and Community Co-ordinator)

Full name (please print)

HUNTER VALLEY OPERATIONS

Organisation (please print)

03/06/2025

Date

Document Title	HVO Version	Version	Date effective	Comment
DRAFT Biodiversity Areas – Management Plan		1	October 2017	Submitted for approval to DoEE on 10 October 2017.
FINAL Biodiversity Areas – Management Plan		1.1	October 2019	Separate Management Plans for HVO Biodiversity Areas merged to create this document.
FINAL Biodiversity Areas – Management Plan		2	December 2020	Update to include reference to Intensive Weed Management Plan at Hook Biodiversity Area and Figure updates
FINAL Biodiversity Areas – Management Plan		3	May 2021	Update offset areas at Wandewoi and Mitchelhill Biodiversity Areas. Update revegetation area at Hook Biodiversity Area
FINAL Biodiversity Areas – Management Plan		3.1	October 2021	Updated to following consultation with the DAWE
Hook Biodiversity Area – Management Plan		4	May 2022	A separate plan for Hook Biodiversity Area extracted from the HVO Biodiversity Areas – Management Plan V3.1
Hook Biodiversity Area – Management Plan	1	5	December 2024	Updated following revised Hook and Wandewoi offset areas Update to Section - 2.2 Information management

Table of Contents

Abbreviations and Definitions

Acronym	Description
asl	Above sea level
BA	Biodiversity Area includes the Offset Area, infrastructure and other land.
BBAM	BioBanking Assessment Methodology
BC Act	NSW *Biodiversity Conservation Act 2016*
CEEC	Critically Endangered Ecological Community
CHVEFW	Central Hunter Valley eucalypt forest and woodland
Coal & Allied	Coal & Allied Operations Limited
COPs	Model Code of Practice
DBH	Diameter at Breast Height
DAWE	Australian Government Department of Agriculture, Water and the Environment (replaced by DCCEEW in July 2022)
DCCEEW	Australian Government Department of Climate Change, Energy, the Environment and Water
DoEE	Australian Government Department of the Environment and Energy (replaced by DAWE in February 2020)
DP	Deposited Plan
EP&A Act	NSW *Environmental Planning and Assessment Act* 1979
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
GDP	Ground Disturbance Permit
ha	Hectare
HLLS	Hunter Local Land Services
HVO	Hunter Valley Operations
IBRA	Interim Biogeographic Regionalisation of Australia
km	Kilometre
LLS Act	NSW *Local Land Services Act 2013*
MNES	Matters of National Environmental Significance
NPWS	NSW National Parks and Wildlife Service
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
Offset Area	Area of vegetation and habitat to be secured by legally binding mechanism.
RCA	Rapid Condition Assessment
SOPs	Standard Operating Procedures
TEC	Threatened Ecological Community
WONS	Weeds of National Significance

1 Introduction

1.1 Background

The action is referred to as Hunter Valley Operations (HVO) – State-approved mining project (EPBC 2016/7640). It comprises the continuation of mining in areas approved by the New South Wales (NSW) State Government after the commencement of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 16 July 2000 and prior to commencement of the *EPBC Amendment Bill 2013* (also known as the water trigger) on 22 June 2013. HVO is a joint venture operation located 24km north of Singleton. The action and required Biodiversity Areas (BAs) are shown on Figure 1.

The action was submitted for determination under the EPBC Act to the former Department of the Environment (DoE) (now the Department of Climate Change, Energy, the Environment and Water (DCCEEW)) on 29 January 2016. On 3 March 2016, the Minister determined that the action was a controlled action under Section 75 of the EPBC Act and was required to be assessed by preliminary documentation under Section 87 of the EPBC Act.

The preliminary documentation report was submitted to DoE on 5 May 2016. The preliminary documentation report concluded that the action was likely to result in significant impacts on the following protected matters:

- Central Hunter Valley eucalypt forest and woodland ecological community (CHVEFW);
- Regent Honeyeater (*Anthochaera phrygia*);
- Swift Parrot (*Lathamus discolor*); and
- Green and Golden Bell Frog (*Litoria aurea*).

The preliminary documentation report included a preliminary strategy to provide offsets for the above protected matters, in accordance with the EPBC Act Environmental Offsets Policy (SEWPaC 2012a).

The action was approved by the Acting Assistant Secretary on 10 October 2016, subject to conditions. The action commenced on 1 November 2016.

Due to the ongoing drought conditions that were experienced in NSW, the requirement to regenerate up to 230 ha of grassland at the Wandewoi BA presented a compliance risk and there are community concerns in relation to the loss of the agricultural landscape of Jerrys Plains. HVO proposed to vary the conditions of approval to substitute the majority of the grassland areas of the Wandewoi BA with equivalent habitats within the Hook BA in Belford, NSW.

It was determined by the Department that in order to facilitate an adequate offset swap for the CHVEFW, it must be demonstrated that the revised offset package meets the approved quantum of impact as calculated by the EPBC Offset Assessment Guide tool. It was also agreed that the calculations that have been accepted by the Department would not be altered, and only those calculations that are impacted by the proposed variation would be contemporised.

An assessment of the Hook BA using the Commonwealth-accredited BioBanking Assessment Methodology (BBAM) and the EPBC Offset Assessment Guide tool was undertaken to demonstrate that the offset swap provides the same or greater offset quantum outcome to the offset required.

In accordance with the approval, the Wandewoi and Hook BAs offset the majority of the action's impacts on CHVEFW and 100% of the action's offset requirements for the Swift Parrot. The Mitchelhill BA offsets 100% of the residual impacts on CHVEFW and 53.9% of the residual Regent Honeyeater impacts. Condon View BA will offset the remaining 46.6% of the residual Regent Honeyeater impacts. Crescent Head BA will offset 100% of the residual significant impact on the Green and Golden Bell Frog when combined with the other compensatory measures.

Figure 1 Location of the Hunter Valley Operations Biodiversity Areas

1.2 Approval history

1.2.1 State

While HVO is managed as one operation, HVO North and HVO South have separate NSW planning approvals. Coal & Allied was granted Project Approval by the NSW Minister for Planning for HVO South on 24 March 2009. The approval was granted under the provisions of the *Environmental Planning and Assessment Act 1979* (EP&A Act), reference NSW PA 06_0261. The approval granted permission to clear 48 ha of remnant native vegetation and 92 ha of regrowth. To offset this impact, 140 ha of Narrow-leaved Ironbark Woodland is to be protected in perpetuity. The offset area to satisfy this condition is located within the Goulburn River BA.

1.2.2 Commonwealth

Referral

A review was undertaken as part of the referral process for EPBC 2016/7640 to identify any new or modified development consents granted under the NSW EP&A Act)after the commencement of the EPBC Act where the approved mining disturbance footprint had increased. The outcomes of the review identified the disturbance areas for the action, namely the West Pit, Carrington Pit, Riverview Pit and Cheshunt Pit extension areas. In May 2015, the Commonwealth Government listed the CHVEFW as a critically endangered ecological community (CEEC) under the EPBC Act. An area of approximately 61 hectares (ha) of CHVEFW was identified within the footprint of the action. Clearing of approximately 61 ha of CHVEFW equates to approximately 0.2% of the total occurrence of the CHVEFW as mapped by the listing and is likely to have a significant impact on the community.

The action will also result in the clearing of potential habitat for the Green and Golden Bell Frog, a vulnerable species under the EPBC Act. An area of approximately 105.3 ha of potential Green and Golden Bell Frog habitat was identified within the footprint of the action. Clearing of approximately 105.3 ha of potential Green and Golden Bell Frog habitat has the potential for a significant impact on this species. Approximately 68.4 ha of Regent Honeyeater and 68.1 ha of Swift Parrot habitat was also identified within the footprint of the action and was deemed likely to result in a significant impact for the species.

Approval pathway

The action was assessed by preliminary documentation. The Commonwealth Minister for the Environment (Minister), under provisions of the EPBC Act, granted approval for HVO on the 10 October 2016 to disturb 61 ha of CHVEFW, 68.4 ha of Regent Honeyeater habitat, 68.1 ha of Swift Parrot habitat and 105.3 ha of Green and Golden Bell Frog habitat. The Commencement of the Action occurred on 1 November 2016.

To compensate for the significant residual impacts from this disturbance on Matters of National Environmental Significance (MNES), a Biodiversity Offset Strategy (EMM 2017a) was submitted and approved by the Minister. Following extensive ecological investigations and discussions with the then Department of Environment and Energy (DoEE) (now DCCEEW), the Biodiversity Offset Strategy has been revised (HVO 2021) to allow for the substitution of the majority of the grassland offset areas at Wandewoi BA for habitats within the Hook and Mitchelhill BAs that will meet the approval requirements.

This Management Plan (Plan) meets the offset requirements for the Hook BA in accordance with Biodiversity Offset Strategy (HVO 2024) and EPBC 2016/7640.

HVO enforceable undertaking

Between May and December 2015, Coal & Allied inadvertently cleared vegetation that was later identified as CHVEFW at HVO. The action was undertaken as part of the pre-stripping operations in advance of the mine, within areas approved for mining by the State.

On 24 December 2015, Coal & Allied notified the DoEE of the action. Based on an initial desktop analysis of regional vegetation mapping (Peake 2006), the notification reported that 16.5 ha of CHVEFW was cleared. Following ecological field investigations, the area of CHVEFW cleared was revised to 31.5 ha.

An investigation report was prepared (EMM 2016) to document the extent of CHVEFW clearing and was provided with an updated notification to DoEE on 29 January 2016. The Minister's delegate determined that Coal & Allied undertook the action without approval, and that the action resulted or was likely to have resulted in a significant impact on CHVEFW.

Compensation for the action is provided in the form of an enforceable undertaking. An enforceable undertaking is a written undertaking provided by a person to the Minister that specifies that the person will pay an amount within a given period to the Commonwealth or to another party for the purpose of protection and conservation of a protected matter.

In relation to the HVO enforceable undertaking (the enforceable undertaking) Coal & Allied committed to the following:

- provision of an offset to compensate for the clearing of 31.5 ha of CHVEFW in accordance with the EPBC Act Environmental Offsets Policy (SEWPaC 2012a) within 12 months of the undertaking;
- securing the offset in perpetuity within a reasonable timeframe;
- provision of additional funds for ongoing management of the offset; and
- re-establishment of species consistent with CHVEFW on 31.5 ha of Derived Native Grassland at Mitchelhill.

The Minister will not pursue further action against Coal & Allied in relation to the action on the basis that the requirements of the enforceable undertaking are fulfilled.

A Biodiversity Offset and Rehabilitation Strategy has been prepared (EMM 2017b) to describe the offset and rehabilitation for the HVO enforceable undertaking. It is proposed that the Mitchelhill BA will offset 100% of the enforceable undertaking's impacts in addition to the offsets provided for EPBC 2016/7640, namely the clearing of 31.5 ha of CHVEFW, Regent Honeyeater and Swift Parrot habitat. Disturbed land (31.5 ha) at Mitchelhill BA will also be rehabilitated to CHVEFW, in accordance with the HVO enforceable undertaking.

Transfer of ownership

On 8 May 2018, Coal & Allied sought approval from the DoEE to transfer the EPBC approval from Coal & Allied Operations Pty Ltd to HV Operations Pty Ltd. This was required due to HVO becoming a joint venture operation. The Department accepted the request on 3 September 2018.

Conditions of approval

This Plan has been prepared in accordance with Condition 11 of the final approval decision notice for EPBC 2016/7640 and addresses all recommendations in the offset management plan checklist. Compliance with Condition 11 and the offset management plan checklist is demonstrated in Table 1 and Table 2, respectively. The conditions of approval are provided at Appendix A of the Plan.

This Plan has been prepared for the Hook BA and specifically addresses the offsets that will be provided at the Hook BA to compensate for the action's impacts on CHVEFW and the Swift Parrot.

Table 1 Compliance with Condition 11

Condition	Page/section addressed in the Plan
11. To compensate for residual impacts to the **protected matters**, the **person taking the action** must submit to the **Department**, for the **Minister's** approval, a Biodiversity Offset Management Plan (BOMP) for each of the **offset areas**. Relevant **offset attributes** and **shapefiles**, must be provided to the **Department** at the time each BOMP is submitted. Each BOMP must:	
a. Detail the location, nature and boundaries of the relevant **offset area**, including textual descriptions and maps;	Section 3.1 and Figure 2 describe the direct offsets for CHVEFW and Swift Parrot at the Hook BA relevant to Conditions 4 and 9 of the approval
b. Include a survey and description of the current condition (prior to management activities commencing) of each offset site;	Section 3.3 describes the current condition of the CHVEFW and Swift Parrot habitat at the Hook BA.
c. Detail management actions to be undertaken at each offset site to protect and improve the habitat quality for the relevant protected matters. This must include but not be limited to weed management, feral animal management, erosion and sediment control, and fire management, as necessary;	Section 5 describes the detailed management actions, timing, performance criteria and completion criteria relevant to Hook BA for the CHVEFW and Swift Parrot.
d. Include timeframes, interim performance targets and completion criteria for implementing all management measures and for achieving and demonstrating achievement of all required improvements in the condition of the offsets. These must include criteria for triggering corrective actions if interim performance targets and/or completion criteria are not met by the relevant timeframes;	Section 5 describes the detailed management actions, timing, performance criteria and completion criteria relevant to the Hook BA for the CHVEFW and Swift Parrot.
e. Include a program to monitor and report on the effectiveness of the management measures, and to assess and demonstrate progress against the interim performance targets and the completion criteria;	Section 6 describes the monitoring program.
f. Identify the potential risks to the successful implementation of the BOMP; and	Section 7 provides a description of potential risks and corrective actions.
g. Include measures that will be implemented to mitigate identified risks to successful BOMP implementation, monitoring to detect the likely realisation of those risks, and corrective measures that will be implemented if those risks are realised.	Section 7 provides a description of potential risks and corrective actions.

Table 2 Compliance of the Plan with the offset management plan checklist

Requirements for OMPs	Page/section addressed in the Plan
1. The plan includes an executive summary which states the relevant approval conditions, expands upon the purpose of the plan, and outlines the primary measures to manage key risks and achieve the plan's objectives.	N/A
2. The plan is required under EPBC Act approval conditions, and includes a table containing: a. approval condition requirements; b. section and page numbers which address the approval conditions; and c. key commitments for meeting each condition requirement.	Table 1 provides the approval conditions and where they are addressed in the Plan. The key commitments are provided in Section 5.
3. The plan is supported by an offset strategy. User inputs to the EPBC Offset Guide are the basis to management planning, specifically: a. completion criteria and interim performance targets are demonstrably based on start quality, future quality with offset and time until ecological benefit; and b. management measures are specifically related to attainment of completion criteria and interim performance targets.	This Plan is supported by the Biodiversity Offset Strategy for EPBC 2016/7640 (HVO 2021) that describes the user inputs to the EPBC Offset Guide.
4. The plan states the environmental outcomes to be achieved by implementing the plan. The plan defines environmental outcomes as measurable extent and condition targets, or circumstances of, the protected matter (e.g. water quality environmental values, ecological attributes/function).	Section 4
5. The plan includes performance targets. For the purpose of the plan, performance targets are time-bound short and medium term targets, for management interventions and environmental condition that are used to monitor, evaluate, review and improve the effectiveness of the plan.	Section 4 describes the objectives, time-bound performance criteria and completion criteria. A trigger, response and action plan is provided for each management action in Section 5.
6. The plan includes management measures that will be implemented to offset environmental impacts. Each management measure: a. has timeframes for implementation; b. is described sufficiently to avoid ambiguity and to inform plan implementation; c. is related to performance targets; and d. is derived from recognised principles, practice, or guidelines, and is justified - technically, scientifically and/or legally – as an effective and appropriate measure to attain and/or maintain the plan's performance targets.	Section 5 describes the management actions, their timeframes and performance targets.
7. The plan describes the purpose of monitoring and its functional relationship to operational decisions.	Section 6.2

8. The plan states monitoring objectives to meet operational decision-making. To this end: a. for each objective, the monitoring plan specifies the variables to be measured, the state and/or rate of change, the precision and confidence, the spatial resolution and time scales required to inform operational decision-making; and b. the monitoring objectives provide for 'early-control' (that management actions are effective) and 'early warning' (corrective actions are required) functions, so as inform timely decisions on corrective actions to ensure performance and completion criteria are achieved.	Section 6.2
9. The plan includes a monitoring program comprised of monitoring methods, a data handling strategy, arrangements for the periodic technical review and evaluation of the monitoring program and timeframes for implementing program components.	Section 6 describes the monitoring methods. Section 2.2 describes the data handling strategy. Section 2.4 describes review of the monitoring program. Table 16 provides the implementation timeframes for the monitoring program.
10. The plan describes the monitoring methods that will be implemented, and: a. includes quantitative (e.g. on-ground survey results) and qualitative baseline data (e.g. photos from photo-point monitoring sites) that establish the start quality/condition of the environment; b. describes the sampling strategy (including monitoring area, site selection and sampling intensity over space and time) and statistical analyses to be employed; c. justifies the sampling strategy/monitoring methods, including through the likely statistical power delivered by the strategy/method; d. justifies the monitoring methods to be used, including: e. an assessment of effectiveness and constraints to use; f. capacity to detect change in environmental condition due to management interventions; g. capacity to demonstrate attainment of performance targets and completion criteria; h. commits to engage appropriately qualified experts to design and conduct monitoring and survey activities, and analyse monitoring results; and i. the location, nature and number of monitoring sites, including benchmark/reference sites to evaluate management performance (c.f. seasonal variation) and that for offset management plans verify future condition without offset values used to determine offset requirements.	Section 6 describes the monitoring methods that will be implemented. Requirements (a.) to (i.) are addressed for each action.

11. The plan includes a data handling program for data storage and protection, data extraction, quality control, analysis, interpretation, reporting and presentation. Data ownership, and distribution, availability and licensing to the Department for compliance and recovery planning purposes, must be specified. Timelines for the data handling, analyses and delivery should be specified.	Section 2.2
12. The plan outlines a periodic technical review and evaluation of the plan and the likely composition of the review committee(s).	Section 2.4
13. The plan assesses the risk of failure to achieve the plan's performance targets. To this end the plan: a. states the plan's performance targets; b. identifies events or circumstances that prejudice attainment/maintenance of performance targets. The events or circumstances must address scientific/ecological uncertainty, stochastic events and legal/land use planning factors that may represent risks; c. includes a qualitative assessment of the likelihood and consequence of those events or circumstances, and the residual risk of failure to achieve those criteria due to identified events or circumstances (assuming management measures will be implemented); d. characterises risk as low, medium, high or severe, and derived from likelihood (highly likely, likely, possible, unlikely, rare) and consequence (minor, moderate, high, major and critical); and e. explains how consequence, likelihood and risk level for each risk have been determined.	Section 4 provides performance targets for the Plan. Section 7 provides a risk assessment for these performance targets.
14. The plan manages the risk of failure by: a. detailing management measures that will be implemented to achieve the performance targets; b. enhancing management measures for high risk events or circumstances, thereby providing a 'margin of safety' to avoid or mitigate the likelihood and/or impacts of the event or circumstance; c. specifying management triggers (measurable events or circumstances) that detect actual or potential issues in a timely manner to avoid, minimise or mitigate adverse impacts; d. ensuring the monitoring program includes activities to detect management triggers, and explaining how monitoring activities may inform the selection and implementation of corrective actions; and e. detailing effective contingency responses and corrective actions that may be implemented if a management trigger is realised.	Section 5 details the management measures. Each management measure has its own trigger, response and action plan that details contingency measures.

15. The plan identifies and manages uncertainty. To this end the plan specifies: a. key data/information used to formulate the plan; b. the limitations and/or uncertainty associated with the use of that data/information; and c. how limitations and/or uncertainty, and associated risks, are mitigated during plan implementation. For example, where a margin of safety is applied to management measures until uncertainty is reduced to an acceptable level or performance criteria are attained/maintained.	Section 7 provides a risk assessment that identifies and provides management for uncertainty.
16. The plan includes a schedule and triggers for auditing the implementation and effectiveness of the plan, and outlines auditable systems for recording plan implementation and the environmental outcomes achieved.	Section 2.4 describes the annual reporting and auditing measures.
17. The plan includes an adaptive implementation program to ensure uncertainty is reduced over time, and that performance targets and completion criteria are achieved. The plan therefore includes arrangements for: a. ensuring new data/information is collected and incorporated into the plan, as a result of implementing the plan and from new information derived from external sources (e.g. academic literature, EPBC policy statements); b. effectively coordinating, scheduling and/or triggering monitoring, risk management, auditing and reporting activities; c. periodically reviewing risks, including in response to the risk level, changing circumstances or the results from implementing contingency responses; d. frequent review of the effectiveness of management measures with significant levels of uncertainty, relatively long implementation timeframes, and upon which the plan is highly dependent; e. addressing the consequences of significant environmental incidents (pre-determined and unanticipated); and f. reviewing the plan under the following circumstances: g. performance reports indicate performance targets/completion criteria may not be achieved; h. according to approved timeframes; and i. the impacts of significant environmental incidents.	Section 5 details the management measures. Each management measure has its own trigger, response and action plan that details contingency measures. The Plan is reviewed annually and monitoring is undertaken to test the efficacy of management measures against performance targets.
18. The plan specifies reporting commitments, including: a. reporting required under EPBC conditions of approval; b. an outline of the standard report content; and c. a schedule and triggers for reporting.	Section 2.4
19. The plan specifies accountabilities for implementing the plan, including management measures, risk management, monitoring, reporting, review, auditing and contingency responses.	Section 2.3 provides responsibilities for the Plan.

20. Maps, plans, figures, images and sections used in the plan: a. are scaled to enable the reader to clearly identify, based on local landmarks (trees, fences, structures) the location of features shown on the map etc; b. shows the offset area in a regional context; c. environmentally sensitive areas on or near the project site, vegetation/habitats that require protection, are buffer or 'no-go' zones d. monitoring locations and/or where random monitoring/survey activities will be undertaken e. shows areas with differing environmental condition or quality; f. include appropriate standard metric scales to represent the information (for example 1:25 000, 1:10 000 and 1:5000). Datum – plans and cross sections refer to AHD; g. have metric measurements, graphic bar scales, local grid lines and standards and north point or orientation of sections (include a key) are used throughout; and h. include title blocks in the lower right hand corner with the following information: EPBC number and project name, title and number of the plan, author, scale, date, source and date of data.	All figures have been prepared in accordance with these mapping requirements.
21. The plan references scientific, legal or other claims or statements that support the effectiveness of the plan, e.g. references to scientific literature, published guidelines, legislation, conservation advice, recovery plans, threat abatement plans.	Section 5.10 describes the consistency of the Plan with statements that support its effectiveness. References for cited literature are provided in Section 8.
22. The plan uses the terms 'will' and 'must' when committing to actions, instead of 'where possible', 'as required', 'to the greatest extent possible', 'should' or 'may'.	Applied throughout the Plan.
23. The footer or header of each page of the plan states the name of the project, the date of the plan and sequential page numbering.	On each page of the Plan.
24. The plan includes a glossary of terms comprised of acronyms, terms open to different interpretations, not in common use, technical or defined in the approval conditions.	Page 7.
25. The plan includes as appropriate implementation, risk assessment and management, monitoring and reporting schedules prepared in accordance with Appendix A.	Section 7 provides risk assessment in accordance with Appendix A. Section 6 provides monitoring in accordance with Appendix A. Section 2.1 provides an outline of report contents.

26. The plan submitted for approval includes an Approval Holder Declaration signed by the approval holder.	Page 2.

1.3 Offsets at the Hunter Valley Operations Biodiversity Areas

The Biodiversity Offsets Strategy (HVO 2021) has been prepared in accordance with the approval conditions and the Offset Strategy ChecklistDepartment.

The Biodiversity Offset Strategy has five objectives:

- To compensate for residual significant impacts to 54.4 ha of Class A condition CHVEFW from the Riverview Pit extension area;
- To compensate for residual significant impacts to 6.6 ha of Class B condition CHVEFW from the West Pit extension area
- To compensate for residual significant impacts to 68.4 ha of breeding and foraging habitat for the Regent Honeyeater;
- 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; and
- To compensate for residual significant impacts to 68.1 ha of winter foraging habitat for the Swift Parrot.

A staged process was originally implemented to identify offset sites that achieve the objectives of the BOS. The first stage comprised a detailed desktop analysis of previous local studies and GIS datasets to identify multiple potential offset sites that contain CHVEFW, Swift Parrot, Regent Honeyeater and/or Green and Golden Bell Frog habitat. A large number of potential offset sites were identified as part of the desktop analysis. The list of these sites was refined to landowners willing to enter into a contract and/or provide access for site assessment purposes.

Preliminary surveys were conducted to determine if the properties identified contained the required biodiversity values. HVO then selected suitable offset sites, namely Mitchelhill BA (comprising Mitchelhill East and Mitchelhill West), Condon View BA and Crescent Head BA (comprising Crescent Head (north) and Crescent Head (south)). Following proposed revisions to the Wandewoi BA boundaries, the Hook BA was surveyed and assessed using the NSW BioBanking Assessment Methodology (BBAM) for inclusion in the BOS. These offset sites were selected based on the results of the preliminary surveys, an assessment of land values and the practicality of ongoing management that would be required. Detailed surveys were completed at these sites to determine the extent of CHVEFW, Swift Parrot and Regent Honeyeater habitat, and targeted surveys and habitat assessment for the Green and Golden Bell Frog.

Following the completion of surveys, the Offset Assessment Guide (DSEWPaC 2012b) was completed for each of properties to determine the percentage of direct offset provided for CHVEFW, Swift Parrot, Regent Honeyeater and Green and Golden Bell Frog. The sites provide a 100% (or higher) direct offset for CHVEFW and Regent Honeyeater, and a 99.29% direct offset for the Green and Golden Bell Frog. The residual 0.71% offset for the Green and Golden Bell Frog has been provided through a contribution to a research program.

The primary measures to achieve the strategy's objectives include:

- the provision of Mitchelhill BA, Condon View BA, Crescent Head BA, Wandewoi BA and Hook BA as direct offsets for CHVEFW CEEC, Regent Honeyeater, Swift Parrot and Green and Golden Bell Frog;
- contribution to a research or conservation program to satisfy the 0.71% residual offset requirement for the Green and Golden Bell Frog;
- implementation of management measures at the direct offset sites, comprising:
  - strategic grazing and weed management to improve the quality of CHVEFW, Swift Parrot and Regent Honeyeater habitat;
  - revegetation of corridors through derived native grasslands to increase the area and resilience of CHVEFW, Swift Parrot and Regent Honeyeater habitat;
  - investigation of the need for Noisy Miner management in Swift Parrot and Regent Honeyeater habitat;
  - management of Mosquito Fish to create suitable conditions for Green and Golden Bell Frog breeding;
  - maintenance of vegetation structure in existing open areas as Green and Golden Bell Frog foraging habitat.

1.4 Intent of the Plan

The Plan provides the management framework for the Hook BA with the aim to protect and enhance conservation values through the implementation of conservation management actions.

The intent of the Plan is to:

- comply with the EPBC 2016/7640 environmental approval;
- support the legally binding conservation mechanism by implementing the conservation management actions in Section 5 and monitoring in Section 6; and
- achieve the conservation objectives set out in Section 4.

The legally binding conservation mechanism must remain on the land title in perpetuity, for the land parcels listed in Section 3.1.

2 Management Plan framework

2.1 Structure of the Plan

For the Plan to be successful it needs to define the baseline ecological condition of the BA, provide clear conservation objectives, detail the conservation management actions and measure success.

This Plan addresses the following:

- Hook Biodiversity Area: describes the BA and baseline ecological condition of the vegetation communities and habitats;
- Conservation Objectives, Key Performance Indicators and Completion Criteria: outlines the conservation objectives for the Plan, conservation values and key performance indicators that have guided the development of conservation management actions and the monitoring program;
- Conservation Management Actions: lists the primary management actions to be implemented to increase the extent, connectivity and condition of the plant community types and habitats, including Trigger, Response and Action plans;
- Monitoring: details the approach to data collection, analysis and interpretation to measure the efficacy of the conservation management strategies, guide adaptive management, identify positive trends in conservation values and assess attainment and maintenance of Key Performance Indicators and Completion Criteria; and
- Risk Assessment: provides a matrix of key risks in the implementation of the Plan and attainment of the objectives.

2.2 Information management

To secure monitoring data and assist in the management of the BA, records are maintained in accordance with HVO's Environmental Management Strategy.

2.3 Key project stakeholders and roles

The key project stakeholders are identified by their roles in Table 3.

Table 3 Key project stakeholders and roles

Roles	Responsible entity	Details
Commonwealth Regulator: Administers approvals granted under the EPBC 2016/7640.	Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW)	postapproval@environment.gov.au (for submission of Plan and matters related to the EPBC approval) EPBCMonitoring@environment.gov.au (for submission of Annual Report and EPBC Annual Compliance reports)
Land owner: Holds the title for the land.	HVO Resources Pty Ltd whose operations are managed by Hunter Valley Operations.	Manager – Environment and Community
Project Proponent: Prepare and implement the Plan and complete reporting.	Hunter Valley Operations	Manager - Environment and Community
Biodiversity Auditor: Monitor improvement in condition of the biodiversity values and completes ecological monitoring.	Hunter Valley Operations	HVO to engage suitably qualified person/s.

2.4 Review and reporting

The Plan will be reviewed every four years from the date the Plan is approved by the Commonwealth approval authority. The review will incorporate suggestions from the Biodiversity Auditor after completing the threatened species and habitat monitoring, update information on the ecological condition and extent of the plant community types and habitats across the BA and refine conservation management actions. The review will incorporate any updated National Recovery Plans and other literature to ensure that the management actions in the Plan are aligned and consistent with current science and conservation management practice.

Revisions of the Plan that reduce the management requirements will require approval from DCCEEW. Any other changes will require notification and a copy (electronic with marked up changes, explanation and the reasons for the changes, as well as the date of the proposed implementation of the revised Plan) to be provided to DCCEEW. Plan updates that will not require approval will be those not likely to have a new or increased impact on the Swift Parrot or CHVEFW (as per Section 143A of the EPBC Act).

Annual Reports will include a summary and analysis of monitoring data and notable management outcomes.

The Annual Report will be submitted to DCCEEW for the period the EPBC Act approval has effect, and will report on the activities undertaken during the previous calendar year. The report will be prepared with input from a suitably qualified ecologist or environmental scientist and will include the following information as a minimum:

- the name and contact details of the Landholder and/or Leaseholder;
- identification of any required vegetation clearing that was undertaken;
- a list of conservation management actions undertaken, describing scope of works, skill and expertise of the responsible entity/ies completing the works and performance;
- monitoring results, with all relevant data correctly labelled with date, location and GPS points;
- an analysis of monitoring results with recommendations for modifications, if any, to the management or monitoring activities;
- an assessment of any new risks or potential threats to the BA and actions to be undertaken to manage these threats and/or risks; and
- an assessment of the progress in attainment of the conservation objectives and key performance indicators.

3 Hook Biodiversity Area

This section provides details on the location, cultural heritage values and vegetation communities at the Hook BA. This BA is required to offset the MNES of CHVEFW and Swift Parrot. Profiles of the CHVEFW and Swift Parrot are provided in Appendix B.

3.1 Location and description

The property is located at 62 Pothana Lane, Belford in NSW, approximately 12km to the east of HVO's mine.

The Hook BA is 157.61 ha in total area. It is comprised of Lot 42 DP 755209, which is owned by Coal & Allied Pty Ltd and Anotero Pty Limited. 152.9 ha is offset area. Figure 2 shows the location of the BA and the cadastral boundaries. The offset area contains the following (noting there is overlap in the CHVEFW and habitats for the Swift Parrot):

- remnant CHVEFW - 78.1 ha;
- regenerating CHVEFW - 28.3 ha;
- derived native grassland proposed for CHVEFW - 2.6 ha (also appropriate foraging habitat for the Swift Parrot); and
- Swift Parrot foraging habitat - 121.5 ha.

The Hook BA falls within the Singleton Local Government Area and within the Hunter Local Land Services (HLLS) region. It is located within the Sydney Basin Bioregion with the majority of the BA in the Hunter Interim Biogeographic Regionalisation for Australia (IBRA) Subregion. The Hook BA is a part of the Central Hunter Foothills (Mitchell) Landscape, which is characterised by Undulating lowlands, rounded to steep hills with rock outcrop on ridges on Permian lithic sandstone, conglomerate, shale and coal (Mitchell 2002). Table 4 provides the regional biophysical context for the BA.

Table 4 Regional biophysical context

Geographical Feature	Description
Bioregion	Sydney Basin
Local Land Services Region	Hunter
IBRA subregion	Hunter
Mitchell Landscape	Central Hunter Foothills
Watercourses	Sweetwater Creek Black Creek Hunter River (part of the Hunter River catchment)
Elevation	50-90m
Geology	Permian
Nearby conservation areas	Belford National Park (approximately 800m north of Hook BA) Werakata National Park (approximately 11km south-east of Hook BA) Yengo National Park (approximately 22km south-west of Hook BA)

The property was historically used for grazing of livestock and some large trees have been selectively logged for timber. The majority of the property is covered in open eucalypt woodland (approx. 121.5 ha) with patches of derived native grassland and regenerating woodland (approx. 35.7 ha) and two dams (0.3ha). Some areas are showing signs of natural regeneration occurring as livestock were removed from the property in 2016 (EMM 2018).

The vegetation on the Hook property is connected to other large tracts of native vegetation to the east and west. Belford National Park is less than 1 km to the north of the property and a number of watercourses are nearby including Sweetwater Creek and Black Creek to the east and Hunter River to north (EMM 2018).

3.2 Cultural heritage

No cultural heritage sites have been identified in the BA. HVO's GDP process will be implemented prior to the commencement of any ground disturbing management actions taking into account the provisions of this Plan. Any identified cultural heritage sites or values will be managed to ensure their protection.

3.3 Vegetation communities

Figure 3 shows the vegetation communities at the Hook BA. Vegetation communities at the Hook BA were mapped and described in the Hook Environmental Offset Assessment (EMM 2018), as summarised below. Further details on the baseline condition of vegetation communities, habitats and bird assemblages can be found in the initial monitoring report (Ecoplanning 2019a).

Vegetation community surveys confirmed the Hook property supports large areas of eucalypt woodlands of reasonable maturity and moderate ecological condition. It was confirmed the majority of woodlands are dominated by spotted gum, grey box and narrow-leaved ironbark, covering a total area of 78.1 ha. This community has been cleared or at least thinned historically as while large canopy trees are present, the majority of canopy trees have a diameter at breast height (DBH) of 20-30cm. Consequently, few hollow bearing trees were recorded, largely restricted to the larger scattered remnant trees.

During flora surveys areas on the property were noted as supporting individuals of red ironbark (*Eucalyptus fibrosa*). Red ironbark was not a dominant canopy species across the property but found to occur as co-dominant species in smaller patches. As the CHVEFW listing does not allow for more than two trees per hectare of red ironbark on average across a patch, any area noted to contain this canopy species has been mapped out and excluded from the proposed CHVEFW offset area.

Forest red gum (*Eucalyptus tereticornis*) grassy open forest is also present in the Hook BA. This vegetation does not conform to the CHVEFW, however is potential Swift Parrot foraging habitat.

The spotted gum, grey box, narrow-leaved ironbark, red ironbark and forest red gum are each important foraging resources for the Swift Parrot.

3.3.1 Vegetation condition

For those woodland patches identified as meeting listing criteria for CHVEFW, three distinct zones were mapped. Zone 1 consists of mature eucalypt forest and woodland areas, Zone 2 consists of areas showing signs of natural regeneration including canopy species consistent with CHVEFW criteria. These areas were assessed as not requiring much intervention due to strong regeneration occurring including canopy species consistent with listing advice. Zone 2 would currently meet requirements for CHVEFW. Zone 3 consists of cleared areas dominated by exotic grasses which would require site preparation and plantings to occur with canopy species consistent with adjacent woodland areas.

The key threat to habitat quality at the Hook BA is the invasion of native plant communities by African Olive (*Olea europaea* subsp. *cuspidate*). The 'Invasion of Native Plant Communities by African Olive (*Olea europaea* subsp*. cuspidata*)' is listed as a key threatening process under the NSW *Biodiversity Conservation Act 2016* (BC Act). Accordingly, additional management actions will be undertaken to improve the habitat values for the swift parrot and the CHVEFW at the Hook BA, as detailed in the Hook Biodiversity Area - Intensive Weed Management Plan (Appendix C).

The starting condition of the vegetation was assessed whereby conditions can potentially range between 1 and 10 (with a condition of 1 comprising a poor condition grassland and 10 comprising an almost pristine unmodified remnant fragment).

The starting quality of this vegetation, combined with the proposed future condition (with management) is summarised in Table 5.

Table 5 Starting condition and proposed changes to condition

Area	Starting Condition	Justification	Future condition	Justification
CHVEFW				
Zone 1 - 78.1 ha	6	– Historic low-level grazing. – Historic timber logging. – Mature eucalypt forest and woodland. – Majority of canopy trees at least 20cm DBH. – Mostly classified as Class A vegetation in accordance with the approved Conservation Advice for CHVEFW (TSSC 2015) – Patch size ≥ 5 ha and with ≥ 50% of perennial understorey vegetation cover native and with at least 12 native understorey species. – Moderate weed infestation, high levels of African Olive.	7	– Weed management. – Targeted African olive control. – Vertebrate pest control. – Canopy gap filling through natural regeneration. – Grazing reduction. – Access control
Zone 2 – 28.3 ha	5	– Historic timber clearing and grazing. – Naturally regenerating eucalypt forest and woodland. – Mostly classified as Class B vegetation in accordance with the approved Conservation Advice for CHVEFW (TSSC 2015) – Patch size ≤5 ha and with ≥ 70% of perennial understorey	7	– Weed management. – Targeted African olive control. – Vertebrate pest control. – Canopy gap filling via natural regeneration. – Grazing reduction.

		vegetation cover native and with at least 12 native understorey species. – Mild waste presence. – Moderate weed infestation, high levels of African Olive.		– Access control.
Zone 3 – 2.6 ha	3	– Historic timber clearing and grazing. – Cleared areas dominated by exotic grasses. – Mild waste presence.	5	– Site preparation and revegetation using appropriate canopy, midstorey and groundcover species. – Weed management. – Vertebrate pest control. – Access control.
Swift Parrot foraging habitat				
121.5 ha	6	– Historic timber clearing and grazing. – Known occurrences of Swift Parrot within 3km to the south-east – Remnant woodland vegetation of a range of ages containing foraging trees appropriate for foraging by the swift parrot. – High African olive presence.	7	– Weed management. – Targeted African olive control. – Vertebrate pest control. – Vertebrate pest control. – Grazing reduction. – Access control.

The time until the above conditions were estimated to be achieved was 10 years for Zone 1 CHVEFW, 20 years for Zone 2 CHVEFW and Swift Parrot foraging habitats, and 30 years for DNG areas of CHVEFW.

Figure 2 Cadastral boundaries at the Hook Biodiversity Area

Figure 3 Vegetation communities and offsets at the Hook Biodiversity Area

4 Objectives, key performance measures and completion criteria

4.1 Conservation objectives

The conservation objective for this Plan is to protect and improve the ecological quality and extent of the conservation values of the BA progressively over 10 years.

The conservation management actions described in Section 5 outline activities to achieve the conservation objectives. The methods to monitor the attainment of these objectives are described in Section 6. The monitoring data will be annually reviewed to adapt conservation management actions through continual improvement.

The key conservation outcomes from the long-term management and protection of the offset areas include:

- protection of the BA under a legally binding conservation covenant;
- protect and improve the ecological quality of 106.4 ha of existing CHVEFW at Hook BA;
- improve the ecological quality of 2.6 ha of DNG proposed to become CHVEFW at Hook BA;
- increased condition and extent of suitable habitats for the Swift Parrot within protected reserves at Hook BA;
- enhanced landscape connectivity within the surrounding landscape;
- improved fauna movement and flora dispersal opportunities within the surrounding landscape; and
- enhanced network of protected vegetation within the Hunter Valley.

4.2 Key performance indicators

I key performance indicators will measure:

- improved condition and extent of CHVEFW and woodland habitats;
- transition of CHVEFW derived grassland to woodland;
- increased targeted habitat for the Swift Parrot; and
- improved or maintained species richness of woodland birds.

Table 6 lists the key conservation values within the BA, key performance indicators and completion criteria. The monitoring program, outlined in Section 6, details the attributes to be measured to provide evidence and demonstrate achievement of the key performance indicators from the implementation of the conservation management actions detailed in Section 5.

Table 6 Key performance indicators and completion criteria

Conservation value	Key performance indicator	Completion criteria
Central Hunter Valley eucalypt forest and woodland	Improved condition and extent over 10 years	Observed and measured increase in condition and extent over 10 years.
▪ CHVEFW	Improved condition of 78.1 ha of woodland and 28.3 ha of regenerating woodland over 10 and 20 years respectively.	Observed and measured increase in condition through monitoring over 10 years in woodland from a score of 6, and regenerating woodland over 20 years from a score of 5. Both remnant and regenerating areas will have a quality score of 7 at the end of their respective period.
▪ DNG (to be regenerated to CHVEFW)	Transition 2.6 ha of grassland to woodland over 30 years	Observed and measured trajectory towards and / or attainment of the key characteristics of CHVEFW from a score of 3 to a score of 5 over 30 years (measured biennially).
▪ Bird Habitat	Bird usage over 30 years	Observed increase or maintained species richness and usage by woodland birds over 10 years (measured biennially).
▪ Swift Parrot foraging Habitat	Improved condition of 121.5 ha of woodland habitats over 20 years	Observed and measured increase in or maintained condition through monitoring over 10 years in woodland (from a score of 6 to a score of 7) in winter flowering canopy species.

4.3 Completion criteria

The objectives will be deemed to be attained when the completion criteria defined Table 6 have been met. Monitoring and management will continue following attainment of the completion criteria as necessary until confirmation to cease is obtained from the Minister or delegate.

The monitoring schedule (Section 6.5.2) includes minimum monitoring frequencies post objective attainment.

5 Conservation management strategies

This section outlines the management actions to protect and increase the extent and improve the condition of the conservation values in the BA. The conservation management strategies focus on addressing the key threats to the conservation values, such as unauthorised activity, clearing, altered fire regimes, weeds, feral animals, and overgrazing.

The following sections detail the purpose, scope and method for the actions. Each action has been assigned performance and completion criteria, triggers for management intervention and corrective actions.

HVO is accountable for the implementation of the conservation management actions detailed in the following sections. This key responsibility rests with the Manager, Environment and Community. Qualified consultants and contractors will be engaged to carry out the monitoring, weed and pest animal control, supplementary planting, construction and maintenance of infrastructure and other works as described in the following sections.

5.1 Controlled activities

5.1.1 Prohibited actions

The BA will have legal protection. HVO will ensure that all employees or representatives, contractors, consultants and visitors are aware of these legal protections and penalties through a site induction prior to entering the BA.

All actions are prohibited in the BA other than:

- the activities detailed in this Plan to manage and monitor the BA for conservation;
- emergency activities conducted by state authorities; and
- vegetation clearing for the maintenance of:
    - access tracks; and
    - a cleared area along permanent boundary fences with neighbouring properties, to a width of 3m.

The Hook BA is unclassified on the Native Vegetation Regulatory Map. The Hook BA contains rural (RU1) zoning. Maps showing the classification and zoning are provided in Appendix D.

5.1.2 Access

Access to the BA will be controlled through locked gates, maintenance of existing boundary fences and signs at main access points to inform all visitors they are entering a protected area. Routine inspections (Section 6.5.2) and maintenance of infrastructure (access/fire tracks, fence lines and gates) will be undertaken to ensure they are to standard and fit for purpose.

Vehicles may cause soil compaction, dispersal of weeds and vegetation disturbance. To minimise the impact of vehicles on the BA, vehicle access will be restricted to authorised personnel only and vehicle speed will be restricted to a maximum of 40km/h. This will be indicated via legible signage (i.e. not faded) posted at entrance points.

Where issues are identified with the integrity of locks, gate, fences and signage, they are rectified within 30 days.

The above will minimise the potential for unintentional damage to existing values present.

5.1.3 Recreation activities and residences

Passive recreation activities, such as bird watching, are permitted in the BA where:

- they do not negatively impact on the conservation values;
- permission is granted by HVO; and
- a risk assessment is completed and approved.

5.1.4 Cultural heritage

No cultural heritage sites will be disturbed by any management actions implemented through the provisions of this Plan. All identified cultural heritage sites or values have been recorded and will be managed to ensure their protection. Consideration of the unknown sites will be given through the implementation of the Ground Disturbance Permit (GDP) process prior to ground disturbing works commencing within the BA.

5.1.5 Waste

Any waste that has been identified at the BA (Figure 4) will be removed. Biannual property inspections will be undertaken which will identify any observed areas or items of waste (see Section 6.5.2) New waste identified will be removed within the calendar year unless the waste presents a potential biodiversity issue (then within 30 days of identification).

5.2 Management of grazing for conservation

Generally, grazing activities will not be undertaken within the Hook BA.

5.2.1 Situations when grazing will be considered

Strategic grazing may be used as a management tool to promote regeneration, control weeds, and reduce excessive fire fuel loads.

Grazing will be excluded from the BA, except to improve conservation values (namely excessive exotic grass or exotic forb coverage) or reduce fire risk, and entirely from sensitive environments including:

- riparian areas; and
- areas of natural regeneration with key CHVEFW species and feed species for Swift Parrot.

Grazing will only be implemented in areas where alternative management activities (such as herbicide treatment or slashing activities) cannot be undertaken e.g. due to terrain or landscape features.

Strategic grazing may be utilised in such areas if it is deemed that the fire risk is excessive, and/or these difficult to access areas have been identified during condition monitoring as a source of weeds that have a detrimental impact on the condition category of the adjacent vegetation community. The fire risk will be determined following appraisal by a qualified person during the winter biannual property inspection (Section 6.5.2) of each year by assessing fuel load.

Should it be implemented, temporary watering points and fencing will be used to protect sensitive areas and restrict the grazing area.

As the purpose of this BA is partially to ensure improvement of the quality of the CHVEFW present, grazing should only be undertaken when it has conservation benefits.

The Conservation Advice states that CHVEFW vegetation community should have (in order to comprise Class A or Class B vegetation):

- at least 12 native understorey species; and
- must have at least 50 % of the perennial understorey vegetation cover that is native.

Grazing will only be considered as an option where survey confirms that exotic species are interfering with native flora species to the extent that the aforementioned criteria are no longer being met and vegetation is consistent with Class C vegetation or lower.

Limitations of grazing

The trigger point to cease grazing will be less than 70% ground cover (i.e. no greater than 30% bare ground) and average height of ground cover of less than 12 cm (approximately 2500 kg dry matter per/ha). The trigger point will be measured using the following quadrat sampling method for ground cover and herbage mass (Lang and McDonald 2005) or another appropriate method.

Using a wooden or metal square (quadrat) of at least 0.5m x 0.5m internal dimensions, undertake the following steps:

a) Walk at random path within each area to be assessed and throw the quadrat a short distance.

b) For each throw look only at the area within the quadrat and assess and record the following:

A = the percentage of total pasture cover (living and dead);
B = the percentage cover of live native plants;
C = the percentage cover of live non-native plants; and
D = measure height of pasture cover using Meat and Livestock Australia Pasture Ruler to estimate herbage mass.

c) Take at least 10 random samples for each assessment area (the number of sample will be increased by 1 for each addition 5ha for areas greater than 50ha).

d) Calculate the percentage of the assessment area covered by vegetation (living or dead): Sum of A / Number of samples.

e) Calculate the percentage of the living vegetation that is live native groundcover by: (Sum of B x 100) / (Sum of B + Sum of C).

f) Calculate average mass by: Sum of D / Number of samples.

Monitoring events for ground cover and herbage mass will occur pre and post grazing. Grazing areas will be examined weekly to determine the timing of the formal monitoring of ground cover and herbage mass.

The quadrat data for the commencement and at the completion of grazing will be provided in the annual reports along with the following information:

- livestock movement including dates of entry and removal from the grazing area;
- a map of the grazed offset area;
- number of livestock and type and;
- quantity of supplement (if any);
- any livestock health or other management issues; and
- daily rainfall data.

Grazing periods will not exceed four weeks in a given area and there will be a minimum of four weeks between grazing events. Grazing will take place outside of the dominant growth periods for native groundcover plants (allowing native groundcover time to actively grow, set and disperse seed), and as such should preferentially occur in autumn or winter.

5.3 Weed control

Weed control will be utilised to keep un-infested areas clear of weeds and control the spread of existing weed infestations in the BA. Weed control will focus on species that exclude or have the potential to exclude native species, disrupt recruitment of native species, impede ecological processes, or impact native animals.

Weed control will prioritise manual and targeted control methods as far as practicable and where they are effective to do so. The use of herbicides in sensitive areas will be minimised and only utilised where alternative weed eradication processes are considered impractical to achieve the intended conservation outcome.

5.3.1 Hook BA – Intensive Weed Management Plan

Survey and mapping of invasive flora species was undertaken at the Hook BA in February 2020. African Olive (*Olea europaea* subsp. c*uspidata*) and other weed species, such as Lantana (*Lantana camara*) and Prickly Pear species (*Opuntia* spp.), have been recorded in large numbers across the BA. The invasion of African Olive presents a serious weed issue at the Hook BA due to its ability to completely alter ecosystem structure. Accordingly, additional management commitments to manage these weeds will be undertaken to improve habitat values for the Swift Parrot and CHVEFW at the Hook BA. These commitments, and associated management actions, performance indicators, monitoring program and reporting requirements are detailed in the Hook Biodiversity Areas – Intensive Weed Management Plan in Appendix C.

5.3.2 Control areas

Weed management containment zones of 50m from the tracks and BA boundaries will be maintained. Any weeds outside of these areas will be controlled based on the observations from the monitoring program and following five yearly weed mapping survey.

5.3.3 Control methods and target weed species

An integrated weed management approach will be implemented utilising a range of suitable control methods.

The preferred control methods are described in Table 7.

Areas identified during the monitoring and mapping surveys as containing weeds that pose a risk to native species management will receive a focus during the subsequent year. Areas that require attention will be ranked according to those containing the noxious and priority weeds over other environmental weeds and/or exotic plants recorded during the surveys and inspections.

The noxious weeds given priority for weed control are those declared under *the Biosecurity Act 2015*. The full list of priority weeds for the Hunter Region are provided at Appendix D.

Table 8 lists the priority and environmental weed species detected at the site to date, their nomination as a Weed of National Significance (WONS), control methods, timing and intensity required to manage these weeds, based on the NSW Department of Primary Industries Noxious and Environmental Weed Control Handbook (NSW DPI 2014). The photos have been sourced from http://weeds.dpi.nsw.gov.au/.

The use of chemicals in the BA will be undertaken by qualified personnel (bush regenerators) with suitable experience in native plant and weed identification and management. All chemical weed control will be in accordance with the registered label or current minor use permit, Safety Data Sheets and appropriate safety standards. Chemical use in the vicinity of waterways will be restricted to herbicides and adjuvants registered for use in or near aquatic environments.

Broadscale spraying of herbicides within sensitive environments will not be undertaken. In these areas, an integrated weed management approach will be implemented utilising a range of suitable control methods such as manual removal and targeted herbicide application.

Chemical weed control operations pose a substantial risk to successful natural regeneration processes unless carefully planned, implemented and monitored. Planning considerations relevant to weed control operations in natural or assisted revegetation areas include:

- selection of personnel based on demonstrated experience and skill in selective weed control methods in regeneration areas; and
- timing of proposed application in relation to recent or planned revegetation works.

5.3.4 Weed control methods

Table 7 Weed control methods

Control method	Potential use in control regime
Chemical control – is the application of chemicals to kill the weed by interfering in the plants growth processes.	Spot application of herbicide is the preferred method of application. Boom spray application is permissible as part of ground preparation for re-establishment activities. Areas that cannot be accessed safely by ground-based methods the use of Unmanned Aerial Vehicles (UAV) may be used.
	Herbicides: Only registered herbicides will be used for the control of the weed species and used in accordance with the directions on the label. Users have a legal obligation to read and follow the instructions on the label. Where appropriate, selective herbicides will be used to minimise impacts on native

	vegetation.
	Handling and application: Herbicide is to be applied to actively growing plants. Herbicides must be handled and applied with consideration of their toxic nature and potentially harmful effects on human health, livestock and the environment. Only accredited and trained in the identification of native plant operators are permitted to apply herbicides. During application weather condition, nozzles, equipment and operator are to be closely monitored throughout application to reduce the risk of drift and subsequent off-target damage. Coarse to very coarse nozzles should be used to increase droplets size. Suitable weather conditions for spraying are extremely important.
	Weather guidelines ▪ Read the product label and follow all label instructions. ▪ Spray when wind is steady and ideally 3–15 km/h. ▪ Avoid variable or gusty wind conditions. ▪ Avoid calm conditions - small droplets remain suspended for long periods. ▪ Spray when wind blows away from sensitive areas. ▪ Avoid spraying in temperatures above 28 °C. ▪ Aim to spray when Delta T is between 2 and 8 and not greater than 10. ▪ Do not spray when inversion conditions exist. ▪ Aim to spray when the atmosphere is neutrally stable. ▪ Most chemicals require a rain free period – check the label. ▪ Be aware of local topographic and convective influences on wind speed and direction. ▪ Record on-site weather conditions at spray time. For more detail please refer to www.bom.gov.au/info/leaflets/Pesticide-Spraying.pdf.
	Reporting: The Pesticides Regulation 2017 requires all commercial pesticide users (that includes farmers, leaseholders and spray contractors) to keep records on their pesticide

	application.
Grazing management	Grazing may be used to control weeds subject to not meeting or exceeding ground cover trigger values (Section 5.2) and there is evidence the weed species are preferentially grazed by stock. Livestock being introduced to a BA will be quarantined for several days, so any potential weed seeds can pass through their digestive system in a known area and be controlled. Spray graze - applying a hormone herbicide and grazing 7-10 days later. Other grazing management practices that are recommended by the Biodiversity Auditor or the Hunter Local Land Services (HLLS) may be implemented.
Biological control – is a long-term control technique.	This is a complementary strategy and alone it may not eradicate the weed. Any use of biological controls will be undertaken in conjunction with appropriate advice.
Slashing – mechanical cutting of weeds to prevent seed production	Areas heavily infested with exotic grasses can be treated with slashing equipment mounted on a tractor prior to flowering (likely to be late spring/ early summer).
Manual removal – removal of the weed plant and roots from the site.	Physical removal of new weeds, unearthing of root systems and containment and removal of seed.

The impact of weeds and the frequency of control methods implemented will be assessed and determined through the ecological monitoring program in addition to observations gathered during the monthly and biannual property inspections. This information will be used to monitor the success of the weed control activities.

Table 8 Priority and environmental weed species, treatment method, control period and intensity

Species	Photo	Duty under Biosecurity Act 2015	WONS	Control method/s	Control period and intensity
WOODY WEEDS					
African Olive (*Olea europaea* subsp. *cuspidata*)		General Biosecurity Duty Regional recommended measures (Hunter)		Chemical - Spot spray, basal bark or cut stump application with registered herbicide	Actively growing From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if identified through monitoring events.
African Boxthorn (*Lycium ferocissimum*)		General Biosecurity Duty Prohibition on dealings	✓	Chemical - Spot spray, basal bark applications and stem injection with registered herbicide. Physical removal – push out the plants in mature thickets.	Year round. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if identified through monitoring events.

Lantana (*Lantana camara*)		General Biosecurity Duty Prohibition on dealings	✓	Chemical – Spot spray and cut stump method with registered herbicide. Manual removal – hand pulling small infestations, bulldozing or slashing for large infestations Biological control – 19 biological control agents are established in some areas, use concurrently with other methods	All year (small plants when actively growing) or between February and the first frost (mature plants >2m) From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if identified through monitoring events.
Coral tree (*Erythrina* x *sykesii*)		Not listed		Chemical – Cut stump method or stem injection with registered herbicide Manual removal – hand-pull or dig out small seedlings	All year Ongoing maintenance, minimum of one control event per year if identified through monitoring events.

PRICKLY PEARS					
Prickly Pear (*Opuntia stricta*)		General Biosecurity Duty Prohibition on dealings	✓	Chemical - Spot spray with registered herbicide. Biological control - (Cactoblastis (*Cactoblastis cactorum*) and Cochineal (*Dactylopius spp.*) – better suited to large infestations or inaccessible areas.	All year – control period. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if identified through monitoring events.
PASTURE / ANNUALS					
Fireweed (*Senecio madagascariensis*)		General Biosecurity Duty Prohibition on dealings	✓	Chemical - Spot spray with registered herbicide whilst the plant is actively growing and not under stress. Manual removal - by hand pulling individual plants.	Autumn to Spring - control period. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if identified through monitoring events.
Paddy's Lucerne (*Sida rhombifolia*)		Not listed		Chemical – Spot spray with registered herbicide. Manual removal - by chipping to remove small infestations.	Spring to December. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if identified through monitoring events.

THISTLES					
Spearthistle (*Onopordum acanthium*)		General Biosecurity Duty		Chemical – Spot spray with registered herbicide. Manual removal by chipping to remove small infestations.	All year (actively growing rosettes to flowering stage) – control period. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if identified through monitoring events.
Variegated thistle (*Silybum marianum*)		Not listed		Chemical – Spot spray with registered herbicide. Manual removal by chipping to remove small infestations.	All year (actively growing rosettes to flowering stage) – control period. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if identified through monitoring events.
VINES					
Madeira Vine (*Anredera cordifolia*)		General Biosecurity Duty Prohibition on dealings	✓	Chemical – Spot spray and scrape and paint application with registered herbicide. Manual removal – may be practical for smaller infestations. Biological – leaf feeding beetle (*Plectonycha correntina*) recently approved for release in Australia, contact local council.	Year round. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if identified through monitoring events.

Duty under Biosecurity Act 2015	Measures
General biosecurity duty	All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.
Prohibition on dealings	Must not be imported into the State or sold.
Regional recommended measure	African Olive (Hunter region): Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce impacts from the plant on priority assets. Land managers prevent spread from their land where feasible. The plant or parts of the plant are not traded, carried, grown or released into the environment

Figure 4 Infrastructure to be retained, waste and weeds at the Hook Biodiversity Area

5.4 Management of fire for conservation

Bushfire prevention is required under the *Rural Fires Act 1997* and a fire regime is required to maintain ecological condition and reduce the risk of damage from wildfire. The absence of fire and the reduction of livestock grazing may lead to a build-up of fire fuel and risk of high intensity bushfire. The land manager is required to take practicable steps to prevent the occurrence of bush fires on the land and minimise the spread of bushfire.

HVO has prepared a Bushfire Management Plan (BFMP) for the Hook BA in consultation with the Rural Fire Service. It identifies fire risks, control measures and communication procedures. The BFMP is subject to review by the RFS and is updated internally by HVO and reissued if significant change is undertaken.

The quick identification of a threatening bushfire, notification of the Rural Fire Service and suppression is the primary goal.

Key control measures comprise:

- documentation of access and water supply points for suppression activities;
- maintain safe and clear access tracks that also form fire breaks;
- a reduction of fuel build-up along potential ignition sources, such as public roads, prior to the fire season;
- use of ecological burns in non-sensitive environments (with any required approvals and/or permits from Rural Fire Service) to reduce fuel build-up to protect the conservation values;
- establishment of asset protection zones around priority infrastructure
- investment in water and other fire suppression assets; and
- communication of the Bushfire Management Plan and response procedures with key stakeholders, including Leaseholders, neighbours, consultants, contractors and employees.

Key management and safety restrictions for total fire ban and very high fire danger rating days include:

- communication of travel plans to HVO personnel, so personnel can be located in the case of an emergency; and
- no undertaking ‘hot works’, unless these activities are required for firefighting purposes.

Any fuel hazard reduction burns will be planned in accordance with the Bush Fire Environmental Assessment Code for New South Wales (Rural Fire Service, February 2006) and the guidelines contained in the Threatened Species Hazard Reduction Lists for the Bush Fire Environmental Assessment Code.

Recommendations under the Code are:

- in woodland vegetation, fire should not occur within 5 years of a previous fire and consideration should be given to burning within 40 years of any previous fire; and
- in grassland vegetation derived from the woodland vegetation, the recommended fire intervals are the same as woodland vegetation.

All ecological burns are dependent upon suitable climatic conditions and appropriate level of risk. The advice of a suitably qualified person experienced in ecological fire management will be required to plan and implement the ecological fire management plan, including a post fire monitoring program to specifically assess the impact of the ecological burn. Any burns are to be

scheduled to occur when conditions are suitable for a low intensity burn. Typically this is winter or early spring. Where possible, burning should be scheduled prior to a significant rain event to assist in extinguishing the fire.

Data is to be recorded for all ecological burns including the date and intensity of the fire, the area burnt (shown on a map) during fire, any canopy scorch, percentage of leaf litter remaining and any interactions with stakeholders. Any additional damage, including fire breaks or new tracks, must also be recorded.

No burning is recommended for grassland areas post planting until plantings are sustainable.

5.5 Infrastructure maintenance and improvement

Improvements to existing infrastructure (such as access tracks/ fire breaks, fences, off-stream watering points or pipes and dam structures) may be required to maintain safe access to undertake management and monitoring activities.

Relevant environmental approvals will be sought where areas of native vegetation supporting habitat for matters of national environmental significance must be cleared to implement infrastructure improvements.

Grading activities will be limited to existing tracks.

Any ground disturbance will be carried out under the Ground Disturbance Permit (GDP) process and will include appropriate pre-clearing assessment to identify resident fauna, threatened flora or habitat features. Should these be identified, HVO will implement measures to minimise impacts on conservation values.

Any clearing required to be undertaken will be quantified and reported within the Annual Report (AR).

5.6 Retention of regrowth and remnant native vegetation

Remnant native vegetation and regrowth is important as it is the key component of the BA. The retention of this native vegetation and its regrowth is important to maintain and enhance the conservation value of the offset area.

Natural regrowth of remnant vegetation will be preferentially retained to promote recovery of native vegetation. Exceptions to this rule include maintenance of fence lines and management tracks associated with the BA (Section 5.1).

Very dense stands can occur after significant site or soil disturbance. These stands may prevent the recruitment of other species and inhibit the potential to achieve the biodiversity and conservation objectives. Regrowth control or thinning of these stands will ensure that a diverse and sustainable woodland community is established with a similar structure, function and composition to the medium to high quality woodlands occurring within the BA.

Thinning of regrowth will be undertaken according to techniques specified in “A Guide to Managing Box Gum Grassy Woodlands” (Rawlings, 2010). Permits under the *Local Land Services Act 2013* will be required for thinning activities and will be obtained prior to the works occurring.

In portions of the Hook BA, the woodlands have been impacted by agriculture and the native plant diversity, community structure and habitat values have been degraded. Consequently, reinstating/restoring these components will aim to:

- increase native mid-storey cover;
- increase native ground cover (herbs, ferns, lilies, rushes, sedges); and

- maintain woodland canopy cover.

The regenerative potential is substantial and natural regeneration is already evident in many areas, particularly where grazing pressure has been removed/substantially reduced. In the absence of disturbance, these areas are likely to regenerate with minimal assistance. Low to moderate management intervention is required in these regions and will be implemented in accordance with the management actions outlined in this section.

5.7 Re-establishment

Existing CHVEFW will be enhanced through the revegetation of derived native grasslands at Hook BA with representative CHVEFW species and Swift Parrot foraging habitat. This will include the 2.6 ha re-establishment area shown in Figure 5. This will increase the extent and resilience of existing CHVEFW patches.

The re-establishment process will use a 'stepping-stone' approach, whereby appropriate species will be planted or direct seeded in patches. Patches will be spaced no more than 30 m apart, so that the patches represent CHVEFW as described in the Approved Conservation Advice for CHVEFW (TSSC 2015). This approach aims to create microclimates that will encourage and support natural regeneration between the patches. All planting and direct seeding will occur when suitable climatic conditions prevail.

5.7.1 Seed collection

It will be permissible to collect seed from remnant patches of ecological communities across the Hook BA. However, seed collection must be for non-commercial purposes and meet the standards of the "Guidelines and Codes of Practice" developed by Florabank (www.florabank.org.au), or subsequent equivalent, and the following limitations and permissions apply:

- collect seed in the BA only if seed of the particular species and genotype is not available elsewhere or if the seed collected is intended for seedlings that will be planted within the BA;
- seeds may not be collected from species individually listed on schedules 1, 2, 3 or 6 of the NSW *Biodiversity Conservation Act 2016* (BC Act) without prior written approval from the Environment Agency Head, or under a licence granted under S2.11 of the BC Act; and
- seeds may be collected from any other native species.

Species for seed collection will be based on the description provided in the following species list. These seeds are from a critically endangered ecological community, and therefore a biodiversity conservation license must be sought under the BC Act prior to seed collection.

Figure 5 Re-establishment area at the Hook Biodiversity Area

5.7.2 Species list

Table 9 lists the CHVEFW species for planting in re-establishment areas at Hook BA. The quantity and diversity of tubestock for planting/direct seeding will target canopy and mid canopy stratum with at least three different species within in each stratum, i.e., a minimum of six species. Understory plantings may also be utilised where there are deficiencies in diversity (i.e., less than 12 species). The seed for the direct seeding works will be selected from the species in Table 9 and/or Appendix B.

Table 9 CHVEFW species planting list

Scientific Name	Common Name	Present at Hook BA	Collection times and notes
Canopy			
Eucalyptus moluccana	Grey Box	Yes	Late summer
Eucalyptus crebra	Narrow-leaved Ironbark	Yes	Late spring
Eucalyptus dawsonii	Slaty gum		
Corymbia maculata (syn. E. maculata)	Spotted gum	Yes	
Mid storey			
Acacia salicina	Cooba		
Allocasuarina luehmannii	Buloke	Yes	
Myoporum montanum	Western Boobialla		
Notelaea microcarpa var. microcarpa	Mock Olive		
Breynia oblongifolia	Coffee Bush	Yes	Spring - autumn
Bursaria spinosa subsp. spinosa	Blackthorn	Yes	Late summer –autumn
Cassinia quinquefaria	Cough Bush		Autumn – winter
Dodonaea viscosa	Hop Bush		Spring – summer
Solanum cinereum	Narrawa Burr	Yes	All year
Groundcover			
Aristida ramosa	Purple Wiregrass	Yes	Autumn – early winter
Austrostipa scabra	Corkscrew Grass	Yes	Summer
Bothriochloa decipiens	Red Grass	Yes	Summer
Brunoniella australis	Blue Trumpet	Yes	Summer
Calotis cuneifolia	Purple Burr-daisy	Yes	Summer
Cheilanthes distans	Bristly Cloak Fern	Yes	All year
Cheilanthes sieberi	Poison Rock Fern	Yes	All year
Chloris ventricosa	Tall Chloris	Yes	Summer – autumn

Chrysocephalum apiculatum	Common Everlasting	Yes	Summer
Cymbopogon refractus	Barbed Wire Grass	Yes	Summer
Desmodium brachypodum	Large Tick-trefoil	Yes	
Desmodium varians	Slender Tick-trefoil	Yes	Spring – autumn
Dichondra repens	Kidney Weed	Yes	
Echinopogon caespitosus	Bushy Hedgehog-grass		Late summer to autumn
Einadia nutans	Climbing Saltbush	Yes	Summer
Eragrostis leptostachya	Paddock Lovegrass		Late summer
Eremophila debilis	Winter Apple	Yes	Late summer – autumn
Glycine clandestina	Twining glycine	Yes	
Lomandra multiflora	Many-flowered Mat-rush	Yes	Summer
Melichrus urceolatus	Urn-heath		Winter – late spring
Microlaena stipoides	Weeping Grass	Yes	Summer
Paspalidium distans		Yes	
Pomax umbellata	-	Yes	Summer
Sida corrugata	-		
Solanum prinophyllum	Forest Nightshade	Yes	All year
Sporobolus creber	Slender Rat's Tail Grass		Spring – autumn
Vittadinia cuneata	Fuzzweed		Late spring - summer
Wahlenbergia communis	tufted bluebell	Yes	

5.7.3 Planting method

Table 10 lists the key planting criteria to increase the likelihood of planting success. This information is to be used as a guide for the re-establishment works within the BA.

Table 10 Key planting criteria

Activity	Comment
Species selection	Species selected are species listed on the description of the vegetation communities issued by the NSW Scientific Committee or NSW government description. Seed can be collected from site or regionally from equivalent vegetation communities.
Cultivation	As a guide, cultivation for tube stock planting should be to a depth of 500-600mm at least 6 months prior to planting and when soil moisture is low to improve sub surface soil shatter, this is not required on sand sites. Cultivation for direct seeding may include light soil scarification.
Pre-plant weed control	As a guide, chemical control of weeds at least 1 week prior to planting or seeding. An area of at least 1m diameter around each tree or seeding patch is to be sprayed to remove all competition for site resources.
Tube stock planting	As a guide, planting will only occur when there is suitable soil moisture, typically in spring or autumn. Tube stock is to be at least 25mm in height, with a well-established root system and in good condition. The tube stock root plug is to be saturated at the time of planting. Soil conditioner is to be applied into the planting hole and all plants should be planted deep, with their root plug at least 50mm below ground and gently firmed in to remove any air pockets in the soil. The spacing of tube stock planting will occur in rows or clusters to create appropriate shelter effects.
Direct seeding	Seed is to be free of weed seed. Seeding must only occur when there is suitable soil moisture in spring or autumn.
Watering	As a guide, watering is to occur at the time of planting or seeding.
Maintenance	Maintenance period will apply for at least 18 months, including post plant weed control.
Replanting	Where the survival of tubestock is less than 60% the area will be supplementary replanted.

All planting activities are dependent upon suitable climatic conditions and may be postponed. If this occurs, weather records will be reported to support any delay in activities.

5.7.4 Survival assessments

Survival assessments are to be completed at approximately 6 and 12 months post planting to assess the success of tubestock planting and direct seeding. Details of the monitoring program are provided in Section 6.5.3. If the results of the 6-month assessment determine that supplementary planting is required, the 12-month assessment will not occur if supplementary plantings are scheduled and yet to be completed.

5.8 Erosion control

There is moderate potential for erosion to occur within the BA. Management options for erosion control include excluding grazing, controlling vehicle access, maintenance of tracks and rehabilitation of drainage lines, watercourses and riparian areas where erosion impacts are identified.

Erosion within the BA will be monitored during the site inspections along with other observations recorded during the ecological monitoring program. Should it be required, appropriate erosion remediation measures will be implemented.

5.9 Vertebrate pest and overabundant native animal control

Vertebrate pest species and overabundant native herbivores can pose a threat to native flora and fauna through degradation of habitat, competition for habitat resources, and direct predation.

The *National Recovery Plan for the Swift Parrot* (Birds Australia 2011), list the following key threatening processes, which are relevant to the vertebrate pest and overabundant native animal control across the BA:

- competition from Noisy Miners;
- environmental degradation caused by the feral European rabbit;
- competition and habitat degradation by feral goats;
- predation by the feral cat; and
- competition from feral honey bees.

There is no specific recovery plan for CHVEFW, however the Conservation Advice for CHVEFW (TSSC 2015) lists the following key threatening processes relevant to this community:

- novel biota and their impact on biodiversity;
- competition and land degradation by rabbits;
- competition from feral honey bees;
- aggressive exclusion by Noisy Miners;
- predation by the European Fox; and
- predation by the feral cat.

The Noisy Miner has been identified throughout Hook BA and is known for its aggressive exclusion of other bird species. However, this species shows a preference for degraded and fringing habitats and become less common with increasing density of trees (correlation with decreasing density of trees and increasing penetration by Noisy Miners (Clarke and Oldland 2007)). Therefore, the best means of reducing impacts from this species is in the reduction of edge effects an increasing the size of remnant fragments via habitat re-establishment.

Although not specifically mentioned under the relevant recovery plans, feral goats and feral deer both have potential to degrade habitats for the Swift Parrot via grazing on planted revegetation and natural recruitment. Feral pigs can additionally cause degradation via pugging and wallows thus reducing potential success of revegetation programs.

This Plan will target the control of declared vertebrate pests and those causing environmental degradation at a regional and local level, and the opportunistic control of the species listed in Table 11. Other vertebrate pests, overabundant native herbivores, or noisy miners will be

managed as required following approval from the relevant authorities prior to their control. All vertebrate pest control activities will be reported in the Annual Report. If a control event is required but conditions are unsuitable justification will be presented in the Annual Report.

Under the LLS Act, species that are currently declared pests in NSW include rabbits, feral pigs and wild dogs. Pest Control Orders can be issued by the regulator to legally enforce land managers to control the species on their land. Land managers are defined as either owners or occupiers of the land. Occupiers of land in NSW are not obliged to control other vertebrate pest animals. However, these species may have significant negative impacts on the environment and agricultural production in many areas. The NSW *Game and Feral Animal Control Act 2002* requires the control of feral deer.

This Plan acknowledges that populations of vertebrate pests are determined by several factors such as topography, shelter, behaviour and food availability. Property fences do not restrict pests, and control actions will not therefore be limited to artificial boundaries. Most vertebrate pests are highly mobile and can readily replace those that are controlled on individual properties. A variety of control methods can be utilised provided they are:

- species specific;
- cause no or little damage to the natural environment;
- are humane;
- meet relevant Work, Health, Safety and Environment regulatory requirements; and
- are regularly monitored.

Control programs are likely to be far more effective when coordinated with multiple landholdings. HVO will endeavour to work with the HLLS on regional control programs and supported by local on ground control actions. Neighbours are to be notified on local on-ground actions to facilitate coordination of efforts and deliver more effective control.

Design and implementation of local controls will be guided by the Model Codes of Practice (COPs) and Standard Operating Procedures (SOPs) produced by the Commonwealth Department of the Environment (available online http://www.pestsmart.org.au/animal-welfare/humane-codes/). The COPs for each of the key pest animal species provides general information on best practice management, control strategies, species biology and impact, and the humaneness of current control methods. The SOPs describe management techniques and their application for these pest animal species, including a discussion of animal welfare impacts for target and non-target species. They also cover the health and safety aspects of management techniques.

The vertebrate pests identified in Table 11 have been recorded or have the potential to occur at the Hook BA. Control methods, timing and intensity are also provided for these species. Where the species has not been identified as residing or traversing through the BA, control methods for that species will not be implemented. The frequency of the control methods will be determined from the monitoring results and may be repeated within a suitable timeframe if required.

Table 11 Identified vertebrate pests control methods, timing and intensity

Pest*	Declared	Control methods	Control timing and intensity
European rabbit (*Oryctolagus cuniculus*)	Yes	Baiting: 1080 / Pindone Trapping: cage trap Shooting: ground based Biological: Myxomatosis and / or Rabbit Haemorrhagic Disease (RHD) Other: Exclusion fencing / Warren fumigation / Warren ripping	Control event in Autumn and /or Spring. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if required.
Feral Deer (*Cervus timorensis*) (*Dama dama*) (*Cervus elaphus*)	Yes	Shooting: ground based	Control event in Autumn and /or Spring. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if required.
Feral cat (*Felis catus*)	No	Trapping: Wire mesh cage trap / Soft net trap/ Padded-jaw trap Shooting – ground based	Control event in Autumn and /or Spring From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if required.
Feral cattle (*Bos taurus*)	No	Other - Exclusion fencing / Mustering	As required.
Feral Goat (*Capra hircus*)	No	Shooting – ground / aerial based Other - Exclusion fencing / Mustering	Control event in Autumn and /or Spring. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if required.
Feral pig (*Sus scrofa*)	Yes	Baiting – 1080 Trapping - Silo, panel or box traps Shooting – ground / aerial based Other - Exclusion fencing	Control event in Autumn and /or Spring. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if required.

Hares (*Lepus europaeus*)	No	Trapping – cage trap Shooting – ground based Other - Exclusion fencing / Habitat modification / Repellents	Control event in Autumn and /or Spring. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if required.
Red fox (*Vulpes vulpes*)	No	Baiting – 1080 Trapping - Wire mesh cage trap / Soft jaw leg hold trap Shooting – ground based Other - Den fumigation / Exclusion fencing / Ejectors / Habitat modification	Control event in Autumn and /or Spring. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if required.
Wild dog (*Canis lupus* spp.)	Yes	Baiting – 1080 / PAPP Trapping - Soft jaw leg hold trap Shooting – ground based Other - Exclusion fencing	Control event in Autumn and /or Spring. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if required.
Noisy Miner	No	Shooting – ground based	Implemented only if bird assemblage monitoring (Section 6.4.2) results indicate that the population is having a detrimental impact on bird diversity.
** Note, the control methods stated would only be implemented should the species be identified as utilising or occurring within the BA, or in the case with the Noisy Miner, monitoring results indicate that the population is having a detrimental impact on bird diversity.*			

5.9.1 Local control

Unless indicated otherwise, local on ground control measures including trapping, baiting and shooting (as appropriate) are to occur across the BA in Autumn and Spring, to coincide with breeding seasons of many of the vertebrate pest species. Reactive control may be undertaken at other times in response to reports of threatened species and/or livestock predation.

All control actions will be undertaken by appropriately qualified personnel and are required to complete a comprehensive job safety assessment prior to commencement of actions. Control actions must follow the COPs and SOPs for the humane control of pest animals.

5.9.2 Regional control

At the Hook BA, participation will continue in regional aerial and ground control programs for feral pigs and wild dogs, managed and coordinated by the HLLS and/or National Parks and Wildlife Service (NPWS). These programs will be permitted to apply across the BA.

Regional control programs are managed and co-ordinated by the HLLS. The HLLS will be responsible for advising the community of the control action, while HVO will notify any adjacent Leaseholders of the proposed action.

5.10 Pre-clearing surveys

Pre-clearing surveys will be undertaken for any shrubby or treed vegetation prior to installing firebreaks or any ground disturbance or significant tree removal. These will be undertaken to identify any resident fauna, threatened flora or habitat features that need to be avoided or relocated. Clearance protocol and preclearance survey requirements are outlined in the HVO Vegetation Clearance Plan.

To ensure only approved areas are disturbed, clearance limits will be clearly identified on plans and on the ground (using durable markers, and / or signage and exclusion fencing). Habitat trees and appropriate micro habitats such as fallen logs will be surveyed and marked to determine if fauna are using them. Any marked trees that show signs of current or recent use are reserved for latest possible removal to encourage fauna to abandon the area of their own accord or undertake possible physical relocation.

In accordance with the HVO Vegetation Clearance Plan (EMM 2016), if the Regent Honeyeater and/or Swift Parrot are recorded during pre-clearance surveys, a two-stage clearance protocol must be implemented. The two-stage clearance protocol requires targeted searches for habitat trees for the two species, and targeted nest searches for the Regent Honeyeater. All habitat trees and/or nests are required to be marked in the field and recorded using a GPS for management during clearance and reporting purposes.

5.11 Summary of performance and completion criteria, triggers and corrective actions

A summary of all performance and completion criteria, accompanied by the Trigger, Action Response Plan is provided in Table 12 and Table 13 respectively.

Table 12 Summary of performance and completion criteria

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
Overall condition of the 106.4 ha of existing CHVEFW is managed	Overall condition (based on vegetation integrity scores for composition, structure and function) of the 106.4 ha of CHVEFW is on an improving trajectory.	Overall condition (based on vegetation integrity scores for composition, structure and function) of the 106.4 ha of CHVEFW is on an improving trajectory.	Overall condition (based on vegetation integrity scores for composition, structure and function) of the 106.4 ha of CHVEFW is on an improving trajectory.	Overall condition (based on vegetation integrity scores for composition, structure and function) of the 106.4 ha of CHVEFW is on an improving trajectory.	Overall condition (based on vegetation integrity scores for composition, structure and function) of the 106.4 ha of CHVEFW is on an improving trajectory.	Overall condition (based on vegetation integrity scores for composition, structure and function) of the 106.4 ha of CHVEFW is improving.	Overall condition (based on vegetation integrity scores for composition, structure and function) of the 106.4 ha of CHVEFW is now at a score of 7.
	Trees are generally in a good state of health, with no signs of substantive depreciation (or negative trend as identified through three consecutive years of monitoring).	Trees are generally in a good state of health, with no signs of substantive depreciation (or negative trend as identified through three consecutive years of monitoring).	Trees are generally in a good state of health, with no signs of substantive depreciation (or negative trend as identified through three consecutive years of monitoring).	Trees are generally in a good state of health, with no signs of substantive depreciation (or negative trend as identified through three consecutive years of monitoring).	Trees are generally in a good state of health, with no signs of substantive depreciation (or negative trend as identified through three consecutive years of monitoring).	Trees are generally in a good state of health, with no signs of substantive depreciation (or negative trend as identified through three consecutive years of monitoring).	Trees are generally in a good state of health, with no signs of substantive depreciation (or negative trend as identified through three consecutive years of monitoring).

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
Prohibited actions	HVO personnel, contractors, consultants or other agents of HVO are made aware of prohibited actions through the induction process.	HVO personnel, contractors, consultants or other agents of HVO are made aware of prohibited actions through the induction process.	HVO personnel, contractors, consultants or other agents of HVO are made aware of prohibited actions through the induction process.	HVO personnel, contractors, consultants or other agents of HVO are made aware of prohibited actions through the induction process.	HVO personnel, contractors, consultants or other agents of HVO are made aware of prohibited actions through the induction process.	HVO personnel, contractors, consultants or other agents of HVO are made aware of prohibited actions through the induction process.	No reported occurrences of prohibited actions undertaken by HVO, contractors, consultants or other agents of HVO.
Exemption of clearing vegetation	Any clearing required is subject to appropriate approvals (including pre-clearing survey for habitat value), and notification is obtained and given. Any clearing of vegetation reported in the Annual Report (AR).	Any clearing required is subject to appropriate approvals (including pre-clearing survey for habitat value), and notification is obtained and given. Any clearing of vegetation reported in the AR.	Any clearing required is subject to appropriate approvals (including pre-clearing survey for habitat value), and notification is obtained and given. Any clearing of vegetation reported in the AR.	Any clearing required is subject to appropriate approvals (including pre-clearing survey for habitat value), and notification is obtained and given. Any clearing of vegetation reported in the AR.	Any clearing required is subject to appropriate approvals (including pre-clearing survey for habitat value), and notification is obtained and given. Any clearing of vegetation reported in the AR.	Any clearing required is subject to appropriate approvals (including pre-clearing survey for habitat value), and notification is obtained and given. Any clearing of vegetation reported in the AR.	Vegetation clearing is only undertaken when necessary to do so. Necessary vegetation clearing was subject to appropriate approvals and reported on in the AR.

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
Access	Biannual Property Inspections completed and include assessment of physical condition of: ▪ existing fencing, gates, signage and locks; ▪ signs of disturbance such as fire and unauthorised access (including hunting firewood collections, new waste)	Biannual Property Inspections completed and include assessment of physical condition of: ▪ existing fencing, gates, signage and locks. ▪ Signs of disturbance such as fire and unauthorised access (including hunting firewood collections, new waste)	Biannual Property Inspections completed and include assessment of physical condition of: ▪ existing fencing, gates, signage and locks. ▪ Signs of disturbance such as fire and unauthorised access (including hunting firewood collections, new waste)	Biannual Property Inspections completed and include assessment of physical condition of: ▪ existing fencing, gates, signage and locks. ▪ Signs of disturbance such as fire and unauthorised access (including hunting firewood collections, new waste)	Biannual Property Inspections completed and include assessment of physical condition of: ▪ existing fencing, gates, signage and locks. ▪ Signs of disturbance such as fire and unauthorised access (including hunting firewood collections, new waste)	Biannual Property Inspections completed and include assessment of physical condition of: ▪ existing fencing, gates, signage and locks. ▪ Signs of disturbance such as fire and unauthorised access (including hunting firewood collections, new waste)	Fences, gates, locks and signage were regularly assessed to ensure potential breaches were promptly identified and rectified.

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
	Any issues with fences, gates, signage and locks are rectified within 30 days of identification.	Any issues with fences, gates, signage and locks are rectified within 30 days of identification.	Any issues with fences, gates, signage and locks are rectified within 30 days of identification.	Any issues with fences, gates, signage and locks are rectified within 30 days of identification.	Any issues with fences, gates, signage and locks are rectified within 30 days of identification.	Any issues with fences, gates, signage and locks are rectified within 30 days of identification.	All required boundary fences, gates, signage and locks are present and regularly monitored and maintained in appropriate condition
	Offset signage includes information of the Conservation status of the area as well as speed limit signage.	Offset signage is replaced if necessary to do so do that necessary information is clearly displayed.	Offset signage is replaced if necessary to do so do that necessary information is clearly displayed.	Offset signage is replaced if necessary to do so do that necessary information is clearly displayed.	Offset signage is replaced if necessary to do so do that necessary information is clearly displayed.	Offset signage is replaced if necessary to do so do that necessary information is clearly displayed.	Offset signage is maintained and clearly legible.
	New waste identified will be subject to removal from the BA within 30 days of its identification.	New waste identified will be subject to removal from the BA within 30 days of its identification.	New waste identified will be subject to removal from the BA within 30 days of its identification.	New waste identified will be subject to removal from the BA within 30 days of its identification.	New waste identified will be subject to removal from the BA within 30 days of its identification.	New waste identified will be subject to removal from the BA within 30 days of its identification.	If relevant, newly identified waste was promptly removed.

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
	The induction process in order to access or undertake work in Hook BA includes briefing on the legal protections associated with the CHVEFW and Swift Parrot as well as the penalties associated with interference with these values.	Induction components in order to access or undertake work in Hook BA are maintained.	Induction components in order to access or undertake work in Hook BA are maintained.	Induction components in order to access or undertake work in Hook BA are maintained.	Induction components in order to access or undertake work in Hook BA are maintained.	Induction components in order to access or undertake work in Hook BA are maintained.	No un-inducted personnel accessed or completed works within Hook BA.

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
Protection of Cultural heritage	Areas of proposed ground disturbance subject to due diligence prior to commencing work. No Cultural heritage sites disturbed and any protective barricading erected and maintained.	Areas of proposed ground disturbance subject to due diligence prior to commencing work. No Cultural heritage sites disturbed and any protective barricading erected and maintained.	Areas of proposed ground disturbance subject to due diligence prior to commencing work. No Cultural heritage sites disturbed and any protective barricading erected and maintained.	Areas of proposed ground disturbance subject to due diligence prior to commencing work. No Cultural heritage sites disturbed and any protective barricading erected and maintained.	Areas of proposed ground disturbance subject to due diligence prior to commencing work. No Cultural heritage sites disturbed and any protective barricading erected and maintained.	Areas of proposed ground disturbance subject to due diligence prior to commencing work. No Cultural heritage sites disturbed and any protective barricading erected and maintained.	Cultural heritage sites were protected through barricading for the duration of this plan.
Waste Removal	Waste identified in Figure 4 progressively removed until none remains.	Waste identified in Figure 4 progressively removed until none remains.	Waste identified in Figure 4 progressively removed until none remains.	Waste identified in Figure 4 progressively removed until none remains.	No originally identified waste in Figure 4 remains.	No originally identified waste in Figure 4 remains.	All originally identified waste from baseline surveys is removed.

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
	Waste identified during biannual Property inspections removed within the calendar year unless the waste presents a potential biodiversity issue (then 30 days of identification).	Waste identified during biannual Property inspections removed within the calendar year unless the waste presents a potential biodiversity issue (then 30 days of identification).	Waste identified during biannual Property inspections removed within the calendar year unless the waste presents a potential biodiversity issue (then 30 days of identification).	Waste identified during biannual Property inspections removed within the calendar year unless the waste presents a potential biodiversity issue (then 30 days of identification).	Waste identified during biannual Property inspections removed within the calendar year unless the waste presents a potential biodiversity issue (then 30 days of identification).	Waste identified during biannual Property inspections removed within the calendar year unless the waste presents a potential biodiversity issue (then 30 days of identification).	No new waste is negatively impacting the condition of the vegetation present.
Monitoring	Two property inspections are undertaken that include recording details required in Section 6.5.2.	Two property inspections are undertaken that include recording details required in Section 6.5.2.	Two property inspections are undertaken that include recording details required in Section 6.5.2.	Two property inspections are undertaken that include recording details required in Section 6.5.2.	Two property inspections are undertaken that include recording details required in Section 6.5.2.	Two property inspections are undertaken that include recording details required in Section 6.5.2.	All Property Inspections (Section 6.5.2) completed.
Grazing	Grazing does not take place, unless as a last resort for the purposes of reducing fuel load and weed infestation.	Grazing does not take place, unless as a last resort for the purposes of reducing fuel load and weed infestation.	Grazing does not take place, unless as a last resort for the purposes of reducing fuel load and weed infestation.	Grazing does not take place, unless as a last resort for the purposes of reducing fuel load and weed infestation.	Grazing does not take place, unless as a last resort for the purposes of reducing fuel load and weed infestation.	Grazing does not take place, unless as a last resort for the purposes of reducing fuel load and weed infestation.	Grazing was only undertaken if determined as necessary to do so in order to minimise fuel load or mange weeds.

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
Weed management	At least one control event per year with additional events as required for species listed in Table 8 or Appendix D that are identified as needing control, and any other weeds needing control recorded from monitoring activities. All actions recorded in the Annual Report.	At least one control event per year with additional events as required for species listed in Table 8 or Appendix D that are identified as needing control, and any other weeds needing control recorded from monitoring activities. All actions recorded in the Annual Report.	At least one control event per year with additional events as required for species listed in Table 8 or Appendix D that are identified as needing control, and any other weeds needing control recorded from monitoring activities. All actions recorded in the Annual Report.	At least one control event per year with additional events as required for species listed in Table 8 or Appendix D that are identified as needing control, and any other weeds needing control recorded from monitoring activities. All actions recorded in the Annual Report.	At least one control event per year with additional events as required for species listed in Table 8 or Appendix D that are identified as needing control, and any other weeds needing control recorded from monitoring activities. All actions recorded in the Annual Report.	At least one control event per year with additional events as required for species listed in Table 8 or Appendix D that are identified as needing control, and any other weeds needing control recorded from monitoring activities. All actions recorded in the Annual Report.	Ecological monitoring data indicates a trajectory for reduction in weed plant cover over three consecutive monitoring events.
Weed monitoring	Complete condition assessment monitoring (Section 6.4.1), rapid condition assessment (Section 6.5.1) and property inspections (Section 6.5.2).	Complete condition assessment monitoring (Section 6.4.1), rapid condition assessment (Section 6.5.1) and property inspections (Section 6.5.2).	Complete condition assessment monitoring (Section 6.4.1), rapid condition assessment (Section 6.5.1) and property inspections (Section 6.5.2).	Complete condition assessment monitoring (Section 6.4.1), rapid condition assessment (Section 6.5.1) and property inspections (Section 6.5.2).	Complete condition assessment monitoring (Section 6.4.1), rapid condition assessment (Section 6.5.1) and property inspections (Section 6.5.2).	Complete condition assessment monitoring (Section 6.4.1), rapid condition assessment (Section 6.5.1) and property inspections (Section 6.5.2).	Weed monitoring is completed

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
Bushfire Management Plan (BFMP)	Actions of BFMP implemented. BFMP reviewed and revised by HVO if required.	Actions of BFMP implemented. BFMP reviewed and revised by HVO if required.	Actions of BFMP implemented. BFMP reviewed and revised by HVO if required.	Actions of BFMP implemented. BFMP reviewed and revised by HVO if required.	Actions of BFMP implemented. BFMP reviewed and revised by HVO if required.	Actions of BFMP implemented. BFMP reviewed and revised by HVO if required.	All required actions of BFMP have been implemented BFMP has been reviewed annually and revised if required.
Ecological burns	None required	None required	None required	None required	Review woodland area for suitability for ecological burn.	None required	The site's suitability for an ecological burn is reviewed.
Bushfire monitoring	Complete condition assessment monitoring (Section 6.4.1) and property inspections (Section 6.5.2).	Complete condition assessment monitoring (Section 6.4.1) and property inspections (Section 6.5.2).	Complete condition assessment monitoring (Section 6.4.1) and property inspections (Section 6.5.2).	Complete condition assessment monitoring (Section 6.4.1) and property inspections (Section 6.5.2).	Complete condition assessment monitoring (Section 6.4.1) and property inspections (Section 6.5.2).	Complete condition assessment monitoring (Section 6.4.1) and property inspections (Section 6.5.2).	Monitoring has been completed as per the schedule.

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
Infrastructure improvements	If infrastructure improvement requiring ground disturbance is necessary, GDP process is completed.	If infrastructure improvement requiring ground disturbance is necessary, GDP process is completed.	If infrastructure improvement requiring ground disturbance is necessary, GDP process is completed.	If infrastructure improvement requiring ground disturbance is necessary, GDP process is completed.	If infrastructure improvement requiring ground disturbance is necessary, GDP process is completed.	If infrastructure improvement requiring ground disturbance is necessary, GDP process is completed.	All required infrastructure improvements requiring ground disturbance were subject to the GDP process.
Monitoring of infrastructure	Infrastructure monitoring undertaken during biannual property inspections (Section 6.5.2). Any repairs undertaken as required.	Infrastructure monitoring undertaken during biannual property inspections (Section 6.5.2). Any repairs undertaken as required.	Infrastructure monitoring undertaken during biannual property inspections (Section 6.5.2). Any repairs undertaken as required.	Infrastructure monitoring undertaken during biannual property inspections (Section 6.5.2). Any repairs undertaken as required.	Infrastructure monitoring undertaken during biannual property inspections (Section 6.5.2). Any repairs undertaken as required.	Infrastructure monitoring undertaken during biannual property inspections (Section 6.5.2). Subsequent Any repairs undertaken as required.	Monitoring has been completed as per the schedule.

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
Natural regeneration	Annual management activities include weed control, vertebrate pest and fire management actions as specified in this plan.	Annual management activities include weed control, vertebrate pest and fire management actions as specified in this plan.	Annual management activities include weed control, vertebrate pest and fire management actions as specified in this plan.	Annual management activities include weed control, vertebrate pest and fire management actions as specified in this plan.	Annual management activities include weed control, vertebrate pest and fire management actions as specified in this plan.	Annual management activities include weed control, vertebrate pest and fire management actions as specified in this plan.	Ecological monitoring demonstrates a trajectory to benchmark values for relevant attributes measured over three consecutive monitoring events (the average of all plots). CHVEFW re-establishment
	As indicated by monitoring result, natural regeneration of canopy species is occurring.	As indicated by monitoring result, natural regeneration of canopy species is occurring.	As indicated by monitoring result, natural regeneration of canopy species is occurring.	As indicated by monitoring result, natural regeneration of canopy species is occurring.	As indicated by monitoring result, natural regeneration of canopy species is occurring.	As indicated by monitoring result, natural regeneration of canopy species is occurring.	

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
	Monitoring indicates that native mid-storey cover and native ground cover (herbs, ferns, lilies, rushes and sedges) are on a positive trajectory.	Monitoring indicates that native mid-storey cover and native ground cover (herbs, ferns, lilies, rushes and sedges) are on a positive trajectory.	Monitoring indicates that native mid-storey cover and native ground cover (herbs, ferns, lilies, rushes and sedges) are on a positive trajectory.	Monitoring indicates that native mid-storey cover and native ground cover (herbs, ferns, lilies, rushes and sedges) are on a positive trajectory.	Monitoring indicates that native mid-storey cover and native ground cover (herbs, ferns, lilies, rushes and sedges) are on a positive trajectory.	Monitoring indicates that native mid-storey cover and native ground cover (herbs, ferns, lilies, rushes and sedges) are on a positive trajectory.	area continuing to occur in vegetation mapped as *Regenerating Central Hunter Valley eucalypt forest and woodland +Red Ironbark* and Regenerating Central Hunter Valley eucalypt forest and woodland (CEEC).

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
Re-establishment of 2.6ha of CHVEFW	Collection of seeds, including those of feed tree specific resources for the Regent Honeyeater and Swift Parrot and those specific to the CHVEFW. Plant propagation.	Collection of seeds as required, including those of feed tree specific resources for the Regent Honeyeater and Swift Parrot and those specific to the CHVEFW Plant propagation. Tubestock planted and/or area direct seeded. Completed survival assessment.	Ecological monitoring completed. Completed survival assessment as required.	Ecological monitoring completed. Completed survival assessment as required.	Ecological monitoring completed. Completed survival assessment as required.	Ecological monitoring completed. Completed survival assessment as required.	Ecological monitoring demonstrates a trajectory to benchmark values for relevant attributes measured over three consecutive monitoring events (the average of all plots). Management monitoring demonstrates a minimum 60% survival rate of planted tubestock in the re-establishment area
	NA	Failed plantings subject to supplementary planting to bring numbers to at least 60% of initial planting density.	Failed plantings subject to supplementary planting to bring numbers to at least 60% of initial planting density.	Failed plantings subject to supplementary planting to bring numbers to at least 60% of initial planting density.	Failed plantings subject to supplementary planting to bring numbers to at least 60% of initial planting density.	Failed plantings subject to supplementary planting to bring numbers to at least 60% of initial planting density.	

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
	2.6 ha of CHVEFW DNG is being progressively re-established.	2.6 ha of CHVEFW DNG is being progressively re-established.	2.6 ha of CHVEFW DNG is progressively re-established.	2.6 ha of CHVEFW DNG is being progressively re-established.	2.6 ha of CHVEFW DNG is being progressively re-established.	2.6 ha of CHVEFW DNG is being progressively re-established.	2.6 ha of treed CHVEFW has been achieved
	Areas of former DNG have canopy stem density, and shrub stem density on a trajectory of that of the CHVEFW Conservation Advice (TSSC 2015) and vegetation is consistent with either open forest or woodland.	Areas of former DNG have canopy stem density, and shrub stem density on a trajectory of that of the CHVEFW Conservation Advice (TSSC 2015) and vegetation is consistent with either open forest or woodland.	Areas of former DNG have canopy stem density, and shrub stem density on a trajectory of that of the CHVEFW Conservation Advice (TSSC 2015) and vegetation is consistent with either open forest or woodland.	Areas of former DNG have canopy stem density, and shrub stem density on a trajectory of that of the CHVEFW Conservation Advice (TSSC 2015) and vegetation is consistent with either open forest or woodland.	Areas of former DNG have canopy stem density, and shrub stem density on a trajectory of that of the CHVEFW Conservation Advice (TSSC 2015) and vegetation is consistent with either open forest or woodland.	Areas of former DNG have canopy stem density, consistent with that of the CHVEFW Conservation Advice (TSSC 2015) and vegetation is consistent with either open forest or woodland.	Areas of former DNG have canopy stem density, consistent with that of the CHVEFW Conservation Advice (TSSC 2015) and vegetation is consistent with either open forest or woodland.

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
Erosion control	Biannual property inspections include erosion assessment. Areas of erosion remediation completed as required and all actions recorded in Annual Report.	Biannual property inspections include erosion assessment. Areas of erosion remediation completed as required and all actions recorded in Annual Report.	Biannual property inspections include erosion assessment. Areas of erosion remediation completed as required and all actions recorded in Annual Report.	Biannual property inspections include erosion assessment. Areas of erosion remediation completed as required and all actions recorded in Annual Report.	Biannual property inspections include erosion assessment. Areas of erosion remediation completed as required and all actions recorded in Annual Report.	Biannual property inspections include erosion assessment. Areas of erosion remediation completed as required and all actions recorded in Annual Report.	No significant erosion that is detrimental to conservation objectives identified in Section 4.1 recorded during final property inspection.
Vertebrate pest – local control	At least one control event per year with additional events as required for species listed in Table 11, and any other species recorded from monitoring activities. All actions recorded in the Annual Report.	At least one control event per year with additional events as required for species listed in Table 11, and any other species recorded from monitoring activities. All actions recorded in the Annual Report.	At least one control event per year with additional events as required for species listed in Table 11, and any other species recorded from monitoring activities. All actions recorded in the Annual Report.	At least one control event per year with additional events as required for species listed in Table 11, and any other species recorded from monitoring activities. All actions recorded in the Annual Report.	At least one control events each year for species listed in Table 11, and any other species recorded from monitoring activities. All actions recorded in the Annual Report.	At least one control events each year for species listed in Table 11, and any other species recorded from monitoring activities. All actions recorded in the Annual Report.	Vertebrate pests not having a significant detrimental impact on conservation objectives.

Activity	Annual criteria Year 1	Annual criteria Year 2	Annual criteria Year 3	Annual criteria Year 4	Annual criteria Year 5	Annual criteria from Year 6 to Year 10	Completion Criteria
Vertebrate pest – regional control	Active participation in program coordinated by HLLS This may include local control actions.	Active participation in program coordinated by HLLS This may include local control actions.	Active participation in program coordinated by HLLS This may include local control actions.	Active participation in program coordinated by HLLS This may include local control actions.	Active participation in program coordinated by HLLS This may include local control actions.	Active participation in program coordinated by HLLS This may include local control actions.	Active participation in control programs.
Vertebrate pest monitoring	Management monitoring program completed.	Management monitoring program completed.	Management monitoring program completed.	Management monitoring program completed.	Management monitoring program completed.	Management monitoring program completed.	Management monitoring program completed.

Table 13 Summary of trigger, action response plan

Management aspect	Key Element	Trigger	Corrective action
Controlled Activities.	Protection of remnant vegetation	Damage to conservation values by persons undertaking controlled activities – reported through Management Monitoring (Section 6.5) or other visitors to the BA	Occurrences recorded by HVO personnel within 30 days of identification. Include occurrence in the Annual Report. Complete self-assessment of the significant residual impact from the damage. In situations where there is assessed to be a significant residual impact, active and or passive restoration works are to be implemented. Review security measures and offset induction procedure.
Access control	Protection of remnant vegetation	Unauthorised stock or personnel access	Identify access points and repair fences appropriately within 15 days. Communicate with agricultural managers and adjacent landholders to emphasise areas where

Management aspect	Key Element	Trigger	Corrective action
			stock are not permitted.
		Clearing outside of areas approved	Undertake supplementary planting to compensate for vegetation lost.
Grazing	Grazing only utilised as a last resort management tool for fuel load management and weed management purposes.	Fuel load is identified as excessive during annual Bushfire Assessments. High fuel load of weeds is reducing condition of grasslands (understorey species diversity is less than 12 and perennial understorey vegetation cover is less than 50% native)	Grazing considered as per Section 5.2.
		Over grazing – groundcover less than 70 % and average height of ground cover of less than 12cm.	Grazing ceased
		Fence damaged and not excluding stock from neighbouring property – impact reported through Management Monitoring (Section 6.5) or visitor to BA.	Fence damaged and not excluding stock from neighbouring property – impact reported through Management Monitoring (Section 6.5) or visitor to BA.
		Neighbour raises concerns over high biomass increasing fire risk - observed high levels of biomass/grass prior to fire season.	Review property inspection and monitoring reports and Bushfire Management Plan. Discuss appropriate course of action with neighbour. Update Bushfire Management Plan if required.
		Biodiversity assessment recommends strategic grazing is required to reduce weed competition and / or encourage	Qualified person to prepare plan to implement strategic grazing to control weeds, manage fire hazard and/or encourage regeneration. Record and report all strategic grazing activities

Management aspect	Key Element	Trigger	Corrective action
		regeneration of native plants when completing Ecological Monitoring.	and outcomes.
Weeds	Weed management	Weeds identified in Table 8 are identified as increasing in abundance or cover during monitoring events. New weeds species specified under the *Biosecurity Act 2015* identified	Target the weed management actions to reduce the identified weed species. Suitably qualified and experienced person to review weed control action.
Fire management	Wildfire event	Unplanned wildfire event occurs.	Assess risks to conservation objectives from the fire. Update BFMP if necessary.
		Post fire monitoring results indicate a reduction in native plant cover and increase in weed cover.	Evaluate active regeneration, increase in weed control if required and implement supplementary planting if necessary.
	Emergency vehicle access	Tracks are in a poor condition for emergency vehicle access.	Slash vegetation on existing tracks. Undertake track remediation works.
Infrastructure maintenance and improvements	Unauthorised clearing	Unauthorised clearing of vegetation for the purpose of infrastructure improvements	Document unauthorised clearing, undertake MNES due diligence assessment, report event if necessary. Implement remedial action (active regeneration) and reporting as necessary
	Fence replacement	Fencing continually damaged by flood waters (as determined by monitoring).	Replace fence with floating fences or re-align fence.
Natural regeneration	Natural regeneration and plant recruitment is occurring	No active regeneration and native plant recruitment by year 5 in grassland recorded through the ecological monitoring, indicated by no trajectory towards	Consider planting actions. Planting actions to be considered include direct seeding and tube stock planting of species selected from the description of the plant community type. Details of the methodology and maintenance to be included in

Management aspect	Key Element	Trigger	Corrective action
		benchmark ranges.	the Annual Report.
Re-establishment	Survival of plantings	Average survival assessment less than 60% during monitoring undertaken (Section 6.5.3).	Review planting activities, determine if poor survival due to climatic conditions or operational matters. Complete further site assessment (including soil and pathogen testing) if cause cannot be identified. Review Plan in light of finding if required and replant the area to replace failed planting numbers to minimum of 60% following favourable conditions and recommence survival assessment monitoring for replanted areas.
		Ecological monitoring does not show trajectory toward reference site or the NSW Biometric benchmark.	Review adequacy of management actions, assess if performance can be attributed to factors that cannot be controlled. Consider review of completion criteria. Revise Plan to include suggested remediation actions.
Erosion control	Active erosion	Active erosion observed through monitoring.	Install erosion control measures, undertake monitoring of the area over 12 months post event to ensure the site is stabilised. Stability will be monitored during the annual inspection regime. All actions and observations will be reported in the Annual Report.
Vertebrate Pests	Vertebrate pest management	Management monitoring identifies vertebrate pest having detrimental impact on conservation values (eg grazing on regeneration and revegetation or damaging trees via rubbing, soil pugging, deceased bird	Increase the number of control events per year. Suitably qualified and experienced person to review control action. Revise the Plan if necessary.

Management aspect	Key Element	Trigger	Corrective action
		presence etc).	
		New vertebrate pest identified within the BA.	Targeted vertebrate pest control updated to include newly identified species. Notify Government Agency and neighbours, if required. Revise the Plan
Bird Assemblage Monitoring	Aggressive exclusion by Noisy Miners	Bird assemblage monitoring indicates a correlation between Noisy Miner presence and declining native bird diversity over three consecutive monitoring events.	Increase re-establishment activities in open habitats to decrease appeal of habitats present to this species. Investigate potential control mechanisms for the Noisy Miner. Implement control activities if approved to do so be relevant control authorities

5.12 Consistency with recovery actions

Table 14 and Table 15 describe the consistency of conservation management strategies with recovery actions for CHVEFW and Swift Parrot respectively.

Table 14 Consistency of conservation management strategies with CHVEFW conservation advice

Actions	Conservation Advice – Central Hunter Valley eucalypt forest and woodland ecological community - threats	Alignment / Contribution
Controlled activities (Section 5.1)	Vegetation clearing. Removal of fallen timber and trees.	The prohibited activities restrict the clearing of vegetation and removal of fallen timber and trees.
Management of grazing for conservation (Section 5.2)	Detrimental grazing, mowing and slashing regimes.	Grazing excluded, with the exception of circumstances where it can promote regeneration, control exotic plants or reduce fire fuel loads.
Weed control (Section 5.3)	Invasive flora species	Control of weeds to reduce regeneration suppression; encourage regeneration; and habitat loss.
Management of fire for conservation (Section 5.4)	Altered fire regimes	Control of fuel loads and ecological burns to address key threatening process such as: frequent fire; and high intensity fires.
Infrastructure improvement (Section 5.5)	Detrimental grazing, mowing and slashing regimes. Invasive flora species. Altered fire regimes	Infrastructure to protect offset areas such as: fencing to exclude persons and grazing; safe access to implement management activities; and fire protection infrastructure.
Retention of regrowth and remnant native vegetation (Section 5.6)	Vegetation clearing	Protection of the BA as an offset will prevent future vegetation clearing.
Re-establishment, linkage and patch size enhancement (Section 5.7)	Landscape fragmentation Climate change.	Active restoration of areas within the offset areas that have limited regenerative capacity and require introduction of plants to trigger regeneration to establish more and enhanced habitat. Increasing the connectivity value and overall patch size of the CHVEFW.
Erosion control (Section 5.8)	Rural, residential and industrial developments	Rural developments have altered flow regimes and water quality, causing erosion and aiding the spread of weeds. Remediation of eroded areas impacting CHVEFW.
Vertebrate pest and overabundant native animal control (Section 5.9)	Introduced animals and aggressive native species	Control of pests, such as pigs, rabbits and wild dogs that destroy vegetation, suppress native regeneration and diminish habitat value.
Ecological monitoring – condition assessment (Section 6.4.1)	To monitor regeneration of grassland and the improvement in ecological condition.	Biennial monitoring measuring 27 attributes to track positive changes in ecological quality.

Table 15 Consistency of conservation management strategies with National Recovery Plan for the Swift Parrot

Actions	National Recovery Plan for the Swift Parrot (2011)	Alignment / Contribution
Controlled activities (Section 5.1)	Manage and protect foraging habitat	Protection of habitat in Hunter Valley identified as Priority habitat for conservation for the species. The prohibited activities address key threatening processes such as: habitat loss and alteration; forestry and firewood collection; and competition from honey bees.
Management of grazing for conservation (Section 5.2)	Manage and protect foraging habitat	The grazing controls addresses key threatening processes such as habitat loss and fragmentation, habitat degradation and regeneration suppression.
Weed control (Section 5.3)	Manage and protect foraging habitat	Control of weeds addressed key threatening process such as regeneration suppression, encourage regeneration and habitat loss.
Management of fire for conservation (Section 5.4)	Manage and protect foraging habitat	Control of fuel loads to address key threatening process such as: frequent fire; and high intensity fires.
Infrastructure improvement (Section 5.5)	Manage and protect foraging habitat	Infrastructure to protect offset areas such as: fencing to exclude persons and grazing; safe access to implement management activities; and fire protection infrastructure.
Retention of regrowth and remnant native vegetation (Section 5.6)	Manage and protect foraging habitat	Protection, improvement and expansion of Swift Parrot foraging habitat.
Re-establishment, linkage and patch size enhancement (Section 5.7)	Manage and protect foraging habitat	Active restoration of areas within the offset areas that have limited regenerative capacity and require introduction of plants to trigger regeneration to establish more and enhanced habitat.
Erosion control (Section 5.8)	Manage and protect foraging habitat	Controlling erosion for the improvement of Swift Parrot foraging habitat condition
Vertebrate pest and overabundant native animal control. (Section 5.9)	Manage and protect foraging habitat	Pest control to address key threatening process such as: Predation– cats. Competition – noisy miners.

6 Monitoring program

6.1 Overview

This Section outlines the monitoring program designed to assess changes in the habitats of the offset areas at three different scales:

- landscape monitoring (long-term):
  - to assess vegetation changes and habitat connectivity at the landscape scale in the long-term;
- ecological monitoring (short to medium-term):
  - condition assessment monitoring to assess habitat condition by quantifying changes in vegetation structure and key fauna habitat features;
  - bird assemblages monitoring to assess changes in bird assemblages
- management monitoring (short-term):
  - rapid condition assessments and property inspections to assess woodland and habitat condition and identify emerging threats;
  - survival assessment to assess the success of re-establishment actions.

6.2 Monitoring objectives

The objectives of this monitoring program are to confirm (or otherwise) that the Plan is being effectively implemented and conservation objectives are being achieved.

Accordingly, the variables to be monitored are:

- the key performance and completion criteria, as described in Section 4;
- the performance criteria and the trigger events, as described in Section 5; and
- scenarios that represent risk to the attainment of the Plan's objectives, as assessed in Section 7.

Monitoring activities will have a clear relationship to operational decision-making such that:

- if the landscape (Section6.3), ecological (Section 6.4), and management (Section 6.5) monitoring demonstrate an increase in habitat extent and enhanced habitat condition then the Plan is achieving the desired outcomes and should proceed without modification;
- if the monitoring indicates no increase in the extent of woodland or enhancement of ecological condition, then the corrective actions listed in the risk assessment in Section 7 should be implemented; and
- if the monitoring indicates that the performance criteria for the conservation management actions are not achieved then the relevant Trigger, Action and Response plan should be enacted.

The Annual Reports will provide ongoing review of the monitoring results. This includes the annual management monitoring and the biennial ecological monitoring reports. These reports may include recommendations to amend the monitoring program and any recommendations will be considered and incorporated as part of the review of the Plan or immediately provided it does not diminish the monitoring effort.

The frequency of monitoring activities will vary according to the monitoring schedule provided in Table 16.

Note that offset monitoring has been ongoing according to the schedule in Table 16 since the EPBC approval in 2016, variation in 2017 and subsequent consultation and acceptance of the draft Biodiversity Areas Management Plan with the then DoEE. Compliance reporting with the commitments made in the Plan has been submitted annually. Additional monitoring events in response to environmental opportunities have been undertaken and reported.

Table 16 Monitoring schedule

Monitoring method	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	On
Landscape								
Aerial photo interpretation	X				X		Repeat every 5 years	Repeat every 5 years
Ecological								
Condition Assessment	Spring	Spring		Spring		Spring		Repeat from Year 2
Bird Assemblage	Winter	Winter		Winter		Winter		Repeat from Year 2
Management								
Rapid Condition Assessment - CHVEFW		Spring	Spring	Spring	Spring	Spring	Spring	Spring
Rapid Condition Assessment – Swift Parrot		Spring	Spring	Spring	Spring	Spring	Spring	Spring
Property inspection	Biannual							

6.3 Landscape monitoring

Aerial photographic imagery for the Hook BA will be updated every 5 years to assess the extent of canopy regeneration within the BA.

The analysis of tree canopy cover will be used to map changes in the distribution and condition of woodland habitats and the connectivity of vegetation remnants. An increase in the extent and condition of woodland habitats will be indicative of successful management of the offset areas towards the Key Performance Indicators.

6.4 Ecological monitoring

6.4.1 Condition assessment monitoring

Condition assessment monitoring aims to assess changes in the condition and extent of the woodland habitats within the Hook BA.

The objectives of the condition assessment monitoring are to demonstrate:

- changes in vegetation community composition, structure and habitat features in the Grassland sites towards the Woodland sites;
- changes in vegetation composition, structure and habitat features towards the plant community type benchmarks and CHVEFW key diagnostic characteristics; and
- recruitment of canopy species by transitioning to older age classes (measured as diameter at breast height).

Permanent monitoring plots have been established across the Hook BA to monitor the condition of woodland reference sites and grassland transition sites. The locations of the plots are shown on Figure 6. Monitoring results will be included in the Annual Report.

The condition assessment monitoring program assesses key vegetation attributes within the BA. Monitoring data is assessed relative to the benchmark values presented in the Bionet Vegetation Type Database (OEH 2017b). These benchmark values relate to species richness and percent cover of native plants in the various vegetation layers. Additional habitat features are also included in this monitoring program to track canopy regeneration and health.

The first survey of all plots was completed in 2018. Subsequent surveys will be undertaken in 2019, 2021, and then biennially (every two years) during Spring.

Field methods

The monitoring plots established across the Hook BA are located within woodland and grassland. The field methods follow the Biodiversity Assessment Method (OEH 2017c). Detailed data is collected on species composition, structure and function. Any updates or alternative methods to the Biodiversity Assessment Method will be considered and implemented if it allows for consistency with the data collected to date.

The plots are 50m x 20m and established such that the plot runs downslope. A 20 m x 20 m quadrat is positioned within this larger plot and one 50m transects runs along its length. Marker pegs are positioned at the top-middle of the plot to establish a permanent plot position. GPS coordinates have been taken to ensure monitoring plots can be relocated over time.

The 20m x 20m quadrat is used to assess the composition (i.e., species richness) for each growth form and if the species is native or exotic. The 20m x 20m quadrat also enables an assessment of the structure (i.e. percentage foliage cover) for each growth form and each native and exotic species within the quadrat.

The 50m x 20m plot is used to assess vegetation function. Specific habitat features, such as the abundance of large trees, tree hollows, litter cover, regeneration, tree stem size classes, fallen logs are also recorded at this scale. Five 1m x 1m quadrats are nested within the 50m x 20m plot to record litter cover.

6.4.2 Bird assemblage monitoring

Bird assemblage monitoring focuses on areas of existing woodland habitat.

The objectives of the bird assemblage monitoring are to:

- demonstrate ongoing habitat usage by woodland birds and a decrease in the relative abundance of bird species typical of forest margins and grasslands (i.e., gradually replaced with typical woodland bird species); and
- assess the presence of Swift Parrot within the offset areas and collect information regarding their movements and habitat usage.

Birds are typically abundant and widespread taxa whose populations are easily surveyed. Although they are relatively mobile, many species can show specialisation in their habitat requirements. Patterns in the distribution and abundance of bird assemblages can be indicative of biodiversity as a whole and of environmental change. Accordingly, bird assemblages are being monitored as indicators of general ecosystem condition.

A desktop study has been undertaken to predict the timing and distribution of the Swift Parrot in the region so that habitat and bird assemblage surveys are designed to maximise the likelihood of detecting these species. Swift Parrots are likely to occur in the region occasionally and in very low numbers between July and October to feed on winter-flowering eucalypts (Swift Parrot Recovery Team 2000; Saunders and Tzaros 2011; OEH 2012b).

Accordingly, bird assemblage monitoring started in winter/spring 2018 to collect baseline data and subsequent monitoring occurred in winter/spring 2019 and 2021, then will be undertaken biennially (every 2 years). Birds Australia may be consulted prior to the commencement of these surveys to coordinate survey effort and increase the likelihood of observations, therefore the timing of survey maybe adjusted.

Field Methods

The bird assemblage monitoring locations are shown in Figure 6.

Habitat area searches are conducted in accordance with Birds Australia Atlas search methodology and EPBC Act bird survey guidelines (DEWHA 2010a). This method involves searching a set area and recording data only from within the pre-defined search zone. A 2ha area is surveyed for 20 minutes by two observers. Broadcast surveys for the Swift Parrot are also undertaken at the same location as the monitoring plots. During this time, all bird species heard or observed will be recorded, along with counts and whether the type of observation (i.e., visual confirmation or audible only and whether the species was observed inside or outside of the survey area).

Incidental and opportunistic surveys are also conducted where suitable habitat areas for the Swift Parrot are observed when travelling to and between monitoring sites. All opportunistic sightings of these species and their locations are recorded. General notes and important habitat resources such as tree hollows, flowering trees and nests are recorded incidentally and photographed, as well as any notable bird activities such as specific forage behaviour or signs of breeding activity. Photo reference points

Photo reference points have been established and permanently marked within each habitat monitoring plot at the top of the middle 50m transect. During each monitoring event, a series of photos is taken from this point to provide a visual record of any changes in vegetation and habitat condition. Depending on the location of the monitoring plot, this might include:

- changes in vegetation structure (e.g. presence/ absence of canopy species, shrubs, tussock grasses);
- the presence/condition of special habitat features (e.g. rock outcrops, flowering/fruiting species); and

- changes in identified threatening processes (e.g. weed infestations, erosion).

At each photo reference point, a minimum of five photos are taken, in the following directions:

- downslope;
- upslope;
- across the slope – left (when facing downslope);
- across the slope – right (when facing downslope); and
- directly down.

The photo records are displayed on the online data management system such that monitoring photos can be viewed against the baseline photo. This will provide an ongoing and gradual visual record of changes in habitats as the management strategies are implemented as well as changes in existing threats and early warning of emerging threats at monitoring sites.

Figure 6 Rapid condition assessment, habitat condition assessment and bird assemblage monitoring locations at the Hook Biodiversity Area

6.5 Management monitoring

6.5.1 Rapid Condition Assessment

Each year, Rapid Condition Assessment (RCA) monitoring is conducted to record the presence or absence of key habitat components and threatening processes at six fixed designated locations (Figure 6). Appendix F provides the RCA report template for assessment of condition of existing and proposed areas of CHVEFW vegetation, as well as an assessment of vegetation coverage of key tree species utilised by the Regent Honeyeater and Swift Parrot.

The results of the RCA, together with property inspections and photo reference points will be used to monitor habitat condition and identify emerging threats.

6.5.2 Property inspections

Regular property inspections will be undertaken to ensure that there is a systematic monitoring of the BA, to ensure its protection and to ensure early detection of potential threats or failures. These will involve a combination of vehicle based and on-foot observation of the following:

- physical condition of fencing (such as downed sections from fallen trees, broken fence lines), and at each access point gates, signage (non-sun damaged and present) and locks (non-tampered with and operational);
- disturbance factors including fire and unauthorised access e.g. hunting, fire wood collection;
- condition of erosion (with a focus on tributaries particularly after heavy rainfall and any measures previously put in place to assist with erosion);
- evidence of waste dumping (including blown in from outside or intentional);
    - for minor blown-in waste removal should be undertaken immediately and documented
- presence/activity of vertebrate pest species (particularly if observation is made of the feral pest species impacting habitat condition, such as ring-barking of trees, grazing on regeneration or pugging causing erosion);
- grazing pressure from over-abundant native herbivores;
- observation of grazing cattle (escapees from adjacent landholdings);
- presence of weed species (with a focus on known infestations of WONS and species listed under the *Biosecurity Act 2015* as well as observation of success of any recent weed management programs undertaken);
- assessment of fire fuel loads in winter; and
- any other observation of note that may have an impact on condition.

Where observations of the above are made, their respective locations will be documented for management purposes.

6.5.3 Survival assessment

To assess the survival of planted tubestock in re-establishment, linkage and patch size enhancement areas, monitoring will be undertaken at 6-months and 12-months post planting (including supplementary plantings).

If the results of the 6-month assessment determine that supplementary planting is required, the 12-month assessment will not occur if supplementary plantings are scheduled and yet to be completed.

The assessment will be undertaken via an on-foot meander within the entire planting area, with a sub-set assessment also undertaken to consider the survival of 100 tubestock plantings within each location.

6.5.4 Grazing monitoring

If grazing is permitted and undertaken, grazing monitoring will be undertaken utilising the methodology specified in Section 5.2.2 on a weekly basis. This monitoring will be utilised to determine whether grazing should be ceased.

6.6 Data analysis, interpretation and reporting

To assess the success of the management actions in meeting the Key Performance Indicators, data on vegetation, fauna habitats and bird assemblages will be analysed against the predicted changes in these groups associated with implementation of the actions.

The ecological data will be analysed to assess the nature and extent of change through time, relative to the benchmark values. It is expected that in subsequent years, with the progressive improvement in habitat condition, the ecological data analysis will eventually show a convergence of ecological variables to that of the benchmark condition. This is expected to be a medium to long-term upward trend that will reflect the enhancement of woodland and the development and availability of critical fauna habitat features such as hollows, ground debris and forage resources. By demonstrating this convergence through time, it will be inferred that the proposed conservation management actions have been successful in restoring the lower quality vegetation and fauna habitats (in particular for Swift Parrot) towards the benchmark/reference condition.

Annual (except for Landscape monitoring which will be every 5 years) reporting will therefore include (but not be limited to):

- comparison of extent of CHVEFW vegetation to baseline levels, and identification of how this compares to required hectare requirements;
- identification of where re-establishment works have been unsuccessful and require supplementary planting;
- for each Condition assessment monitoring site:
  - Whether the trajectory of native floristic composition and structure are improving or declining in comparison to baseline values
  - Whether habitat features are improving, declining or remain stable in comparison to baseline
  - Progress of natural recruitment (if natural success (i.e. saplings are present), is regeneration growing (as shown by increases in DBH))
  - If re-establishment areas contain assemblages with key diagnostic features of CHVEFW, and if not where do the deficits occur.
- bird species diversity, including notes of any observations of the Swift Parrot. As well as notes on the presence of bird species prone to aggressive exclusion, with a focus

on but not limited to the Noisy Miner. This will include correlations of Noisy Miner presence with overall bird species diversity;

- comparison of photo monitoring for progress;
- indication of the health of tree species that provide a foraging resource to the Swift Parrot;
- indication of whether targeted planting activities that have been undertaken are relevant as foraging resources for the Swift Parrot;
- indication of whether targeted planting activities have adequately survived to replicate required tree densities of a CHVEFW;
- if grazing is undertaken, notes on why grazing was initiated, duration of the grazing undertaken and any before and after monitoring results on fuel load decreases, exotic species changes and native species diversity and abundance changes;
- key threats observed that either are or could potentially limit the successful improvement of ecological condition (including factors assessed during property inspections (Section 6.5.2)) and
- recommendations for improvement of current management actions (if required).

7 Risk assessment

7.1 Risk ratings

The risk assessment is undertaken in accordance with the following risk framework, having regard for the likelihood and consequence definitions used below. A risk assessment and corrective actions are provided in Table 17. Most risks will be mitigated using regular monitoring and therefore early identification of any issues.

Likelihood	Consequence					
		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Qualitative measure of likelihood (how likely is it that this event/circumstances will occur after management actions have been put in place/are being implemented)	
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances
Qualitative measure of consequences (what will be the consequence/result if the issue does occur)	
Minor	Minor risk of failure to achieve the Plan's objectives. Results in short term delays to achieving Plan objectives, implementing low cost, well characterised corrective actions.
Moderate	Moderate risk of failure to achieve the Plan's objectives. Results in short term delays to achieving Plan objectives, implementing well characterised, high cost/effort corrective actions.
High	High risk of failure to achieve the Plan's objectives. Results in medium-long term delays to achieving Plan objectives, implementing uncertain, high cost/effort corrective actions.
Major	The Plan's objectives are unable to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies.
Critical	The Plan's objectives are unable to be achieved, may include widespread and severe environmental harm, with no evidenced mitigation strategies.

Table 17 Risk assessment and corrective action matrix

Objective	Scenario	Likelihood	Consequence	Risk level	Trigger	Corrective Action
To protect the conservation values of the offset area within 10 years at the BA.	Delay in securing the offset area under a legally binding mechanism	Likely	Minor	Low	NSW biodiversity reforms not providing a fit for purpose mechanism to practically and legally secure EPBC offset areas.	Additional consultation with DCCEEW
	Unable to attach the Plan to the land title.	Likely	Minor	Low	NSW government requires different plan to be attached to the land title.	Ensure that a new plan is equivalent to this Plan.
	Illegal access to offset area causing significant residual impact.	Unlikely	Moderate	Low	Failure in access control (Section 5.1.2) captured in management monitoring (Section 6.5) and reported in the Annual Report.	Review access control and improve security measures. Increase monitoring effort.
	Improper contractor vehicle use resulting in impacts such as soil compaction, weed dispersal or vegetation disturbance, on habitats	Possible	Moderate	Medium	Failure in access control (Section 5.1.3) captured in management monitoring (Section 6.5) and reported in the Annual Report.	Review access control and improve security measures. Increase monitoring effort.

	Uncontrolled bushfire impacts BA.	Possible	High	Medium	Bushfire on extreme or catastrophic fire danger day impacts offset area.	Implement Post Fire Event recovery with NSW Rural Fire Service. Complete post fire survey, map fire damaged areas, and revise the Plan.
To enhance the condition of conservation values of the offset area within 10 years at the BA.	No improvement in condition of the conservation values measured by the Ecological Monitoring (Section 6.4).	Possible	Moderate	Medium	Review of Annual Reports and Monitoring data.	Increase monitoring effort. Review management actions. Assess influence on success from other factors such as extreme climatic conditions.
	No increase in extent of woodland or in habitat connectivity from the active restoration of grassland as measured by the landscape monitoring (Section 6.3) and Ecological Monitoring (Section 6.4).	Possible	Moderate	Medium	Review of Annual Reports and Monitoring data.	Increase monitoring effort. Review management actions. Assess influence on success from other factors such as extreme climatic conditions.

8 References

Birds Australia (2011) *National Recovery Plan for the Swift Parrot,* Swift Parrot Recovery Team, Victoria

Clarke MF, and Oldland JM, July 2007. Penetration of remnant edges by Noisy Miners Manorina melanocephala and implications for habitat restoration Wildlife Research, 34 (4): 253-261

Department of the Environment, Water, Heritage and the Arts (DEWHA) (2010a) Survey guidelines for Australia's threatened birds. Canberra, ACT, Commonwealth Department of Environment, Water, Heritage and the Arts.

Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2012a), *EPBC Act Environmental Offsets Policy*, Department of Sustainability, Environment, Water, Population and Communities, Canberra

Department of Sustainability, Environment, Water, Population and SEWPaC (2012b) Regent Honeyeater in Species Profile and Threats Database. Canberra, ACT, Commonwealth Department of Sustainability, Environment, Water, Population and Communities

Ecoplanning (2019a) Ecological Offsets – Condition Assessment Monitoring (Wandewoi, Mitchelhill and Hook Biodiversity Areas). Report prepared for Hunter Valley Operations.

EMM (2016) *HVO State-approved mining Investigation report,* report to Rio Tinto Coal Australia

EMM (2017a) *HVO State-approved mining (EPBC 2016/7640) Biodiversity Offset Strategy*. Report to Rio Tinto Coal Australia

EMM (2017b) HVO enforceable undertaking biodiversity offset and rehabilitation strategy. Report to Rio Tinto Coal Australia

Lang, D. and McDonald, W. (2005), Maintaining groundcover to reduce erosion and sustain production. NSW Department of Primary Industries, Agfact P2.1.14

NSW Department of Primary Industries (NSW DPI) (2014) Noxious and Environmental Weed Control Handbook.

Mitchell, P. B. (*unpub*.) NSW ecosystems study: background and methodology. Unpublished report to the NSW National Parks and Wildlife Service, Hurstville

NSW Rural Fire Service (2006) Bush Fire Environmental Assessment Code for New South Wales.

Office of Environment and Heritage (OEH) (2012a) OEH guidelines Erosion and sediment control on unsealed roads

Office of Environment and Heritage (OEH) (2012b) Swift Parrot - profile. Hurstville, Office of Environment and Heritage.

Office of Environment and Heritage (OEH) (2017b) Bionet Vegetation Type Database http://www.environment.nsw.gov.au/

Office of Environment and Heritage (OEH) (2017c) *Biodiversity Assessment Method,* Office of Environment and Heritage, Sydney

Peake, T (2006) *The vegetation of the central Hunter Valley NSW,* Hunter-Central Rivers Catchment Management Authority, Paterson

Rawlings, K (2010) A guide to managing box gum grassy woodlands DEWHA, Canberra.

Saunders, D. L. and Tzaros, C. L. (2011) National Recovery Plan for the Swift Parrot (*Lathamus discolor*). Melbourne, Birds Australia.

(http://www.environment.gov.au/biodiversity/threatened/publications/recovery/pubs/lathamus-discolor-swift-parrot.pdf)

Swift Parrot Recovery Team (2000) Swift Parrot Recovery Plan 2001-2005. Hobart, Department of Primary Industries, Water and Environment.

Threatened Species Scientific Committee (TSSC) (2015) Approved Conservation Advice for the Central Hunter Valley eucalypt forest and woodland ecological community, Threatened Species Scientific Committee, 7 May 2015.

Wakefield, S. and Goldney, D.C. (1997) Save the Bush Toolkit. Charles Sturt University, Bathurst

Appendix A Condition of approval EPBC 2016/7640

Appendix B Profiles of the Central Hunter Valley eucalypt forest and Swift Parrot

B.1 Central Hunter Valley eucalypt forest

Table 18 describes the key diagnostic characteristics of CHVEFW as described in the Approved Conservation Advice for the Central Hunter Valley eucalypt forest and woodland ecological community (TSSC 2015).

Table 18 Key diagnostic characteristics of CHVEFW

Characteristics	Hook BA		
	Present in CHVEFW?	Present in regenerating CHVEFW?	Present in DNG?
It occurs in the Hunter River catchment (typically called the Hunter Valley region);	Yes	Yes	Yes
AND			
It typically occurs on lower hillslopes and low ridges, or valley floors in undulating country; on soils derived from Permian sedimentary rocks;	Yes	Yes	Yes
AND			
It does not occur on alluvial flats, river terraces, aeolian sands, Triassic sediments, or escarpments;	Yes	Yes	Yes
AND			
It is woodland or forest, with a projected canopy cover of trees of 10% or more; or with a native tree density of at least 10 native tree stems per 0.5 ha (at least 20 native tree stems/ha) that are at least one metre in height;	Yes	Yes	No
AND			
The canopy of the ecological community is dominated by one or more of the following four eucalypt species: *Eucalyptus crebra* (narrow-leaved ironbark), *Corymbia maculata* (syn. *E. maculata*) (spotted gum), *E. dawsonii* (slaty gum) and *E. moluccana* (grey box); OR a fifth species, *Allocasuarina luehmannii* (bulloak, buloke) dominates in combination with one or more of the above four eucalypt species, in sites previously dominated by one or more of the above four eucalypt species;	Yes	Yes	No

AND			
Allocasuarina torulosa (forest oak/ she-oak, rose she-oak/oak), *Eucalyptus acmenoides* (white mahogany) and *E. fibrosa* (red/broad-leaved ironbark) are largely absent from the canopy of a patch;	Yes	Yes	Yes
AND			
A ground layer is present (although it may vary in development and composition), as a sparse to thick layer of native grasses **and** other native herbs and/or native shrubs.	Yes	Yes	Yes
Does the community represent CHVEFW?	Yes	Yes	No, however, given that the zone would have once been CHVEWF and there are still characteristic species present the zone would be capable of regenerating to CHVEFW with appropriate management

Table 19 provides a full species list (Peake 2006) for CHVEFW.

Table 19 Species list for CHVEFW

Scientific name	Common name
Acacia amblygona	fan wattle
Acacia bulgaensis	Bulga wattle
Acacia cultriformis	knife-leaf wattle, dog-tooth wattle
Acacia decora	western silver/golden / showy wattle
Acacia falcata	burra, hickory wattle, silver-leaved wattle
Acacia implexa	lightwood
Acacia parvipinnula	silver-stemmed wattle
Acacia pendula	weeping myall
Acacia salicina	cooba, coobar, willow wattle
Ajuga australis	Australian bugle
Allocasuarina luehmannii	buloke, bull oak, bulloak, bull sheoak
Angophora floribunda	rough-barked apple
Aristida ramosa	wire-grass, purple wire-grass
Aristida vagans	three-awn spear-grass
Austrostipa scabra	rough needle-grass, spear-grass
Brachychiton populneus subsp. populneus	kurrajong
Brachyscome multifida	cut-leaved daisy
Bothriochloa decipiens	pitted blue-grass, red grass
Breynia oblongifolia	breynia, coffee bush
Brunoniella australis	blue trumpet
Bursaria spinosa subsp. spinosa	blackthorn
Calotis cuneifolia	purple burr-daisy
Calotis lappulacea	yellow burr-daisy, yellow daisy-burr
Callitris endlicheri	black Cypress-pine, black/red Cypress
Cassinia quinquefaria	cassinia
Cheilanthes sieberi subsp. seiberi	mulga fern, narrow rock-fern
Cheilanthes distans	bristly cloak-fern, bristly rock-fern
Chloris ventricosa	tall chloris, plump windmill-grass
Chrysocephalum apiculatum	yellow buttons, common everlasting
Corymbia maculata (syn. Eucalyptus maculata)	spotted gum
Cymbopogon refractus	barbed-wire grass
Cyperus gracilis	slender sedge
Daviesia genistifolia	broom bitter pea
Daviesia ulicifolia	gorse bitter-pea
Desmodium brachypodum	large tick-trefoil
Desmodium varians	slender tick-trefoil

Dichondra repens	kidney weed, kidney grass
Dianella revoluta	blueberry lily, blue flax-lily
Dodonaea viscosa	sticky hop-bush, giant hop-bush
Dodonaea viscosa subsp. cuneata	wedge-leaf hop-bush
Echinopogon caespitosus var. caespitosus	tufted hedgehog-grass
Einadia nutans	climbing saltbush, nodding saltbush
Entolasia stricta	wiry panic
Eragrostis leptostachya	paddock lovegrass
Eremophila debilis	winter apple, creeping boobialla, amulla
Eucalyptus albens	white box
Eucalyptus blakelyi	Blakely's red gum
Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus dawsonii	slaty gum
Eucalyptus glaucina	slaty red gum
Eucalyptus moluccana	grey box
Eucalyptus punctata	grey gum
Eucalyptus tereticornis	forest red gum
Fimbristylis dichotoma	common fringe-rush
Geijera salicifolia	scrub/brush wilga, greenheart, green satinheart
Glycine clandestina	twining glycine
Glycine latifolia	glycine pea, variable glycine
Hakea sericea	silky hakea, bushy needlewood
Hypericum gramineum	small St John's wort
Laxmannia gracilis	slender wire lily
Lissanthe strigosa	peach heath
Lobelia purpurascens (syn. Pratia purpurascens)	whiteroot
Lomandra multiflora	many-flowered matrush
Melichrus urceolatus	urn heath
Microlaena stipoides var. stipoides	weeping grass, meadow rice-grass
Myoporum montanum	western boobialla, water-bush
Notelaea microcarpa var. microcarpa	native olive
Olearia elliptica	sticky daisy-bush
Opercularia diphylla	stinkweed
Paspalidium distans	spreading panicgrass
Phyllanthus virgatus	creeping phyllanthus
Pomax umbellata	pomax
Psydrax odorata	shiny-leaved canthium, inland native coffee
Pultenaea spinosa	spiny /grey bush-pea
Sida corrugata	corrugated sida

Solanum brownii	violet nightshade
Solanum cinereum	Narrawa burr
Solanum prinophyllum	forest nightshade
Sporobolus creber	slender rat's-tail grass
Stackhousia viminea	slender stackhousia
Themeda triandra (syn. T. australis)	kangaroo grass
Vernonia cinerea	vernonia
Vittadinia cuneata	fuzzweed
Wahlenbergia communis	tufted bluebell
Wahlenbergia gracilis	Australian / sprawling bluebell

B.2 Swift Parrot

The Swift Parrot is small parrot about 25cm long. It is bright green with red around the bill, throat and forehead. It has a long (12 cm), thin tail, which is dark red. The Swift Parrot is listed as a critically endangered species under the EPBC Act.

The Swift Parrot is a migratory bird species that occurs in south-east Australia, between Tasmania and NSW. In NSW, this species occurs mainly on and to the east of the Great Dividing Range, in the Central and Southern Tableland regions and in coastal regions south of the Hunter Valley. Some rarer scattered occurrences have been recorded further north and further to the west.

On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood, Mugga Ironbark and White Box. Also, the swift parrot commonly forages on lerp infested trees which include Western Grey Box, Coastal Grey Box and Blackbutt. The swift parrot returns to some foraging sites on a cyclical basis depending on food availability.

The National Recovery Plan for the Swift Parrot (Birds Australia 2011) provides direction on the management actions for the long term protection and conservation of the species. The Swift Parrot is likely to frequent the BA during the winter months. The mature Grey Box trees provide foraging opportunities for the Swift Parrot.

Key management strategies for their protection and conservation include:

- no clearing of vegetation;
- revegetation to reconnect fragmented remnant vegetation;
- protection from high frequency fire events;
- control of predators, such as feral cats; and
- reduced competition from European bees.

http://www.environment.gov.au/system/files/resources/c3e20a20-8122-4a9c-bd06-455ea7620380/files/lathamus-discolor-swift-parrot.pdf

Photograph 1 Swift Parrot (source: Chris Tzaros)

Appendix C Hook Biodiversity Area – Intensive Weed Management Plan

HUNTER VALLEY OPERATIONS

INTENSIVE WEED MANAGEMENT PLAN

Hook Biodiversity Area

Document Number:	HVOOC-1797567310-3396
Status:	Pending
Version:	1.1
Effective:	
Review:	
Owner:	

Uncontrolled when printed

Table of contents

1 Introduction

Hunter Valley Operations (HVO) own a suite of properties that form part of the proposed Biodiversity Offsets Strategy to compensate for residual significant impacts resulting from the HVO extension project (EPBC 2016/7640).

The Hook Biodiversity Area (BA) is one such property located on Pothana Lane, Lower Belford NSW, and is an estimated 156 hectares (ha) in area. The property is located in the Hunter Valley, approximately 24 km north of Singleton, and approximately 20 km to the east of the HVO mine and associated impact areas.

1.1 Background

The Hook BA has been proposed as an offset site for the HVO extension project (EPBC 2016/7640) to offset impacts on the swift parrot (*Lathamus discolor*) and the Central Hunter Valley Eucalypt Forest and Woodland critically endangered ecological community (CHVEFW CEEC), both listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The site contains suitable swift parrot winter foraging resource habitat and the Central Hunter Valley Eucalypt Forest and Woodland CEEC. In accordance with the assessment under the EPBC Act Environmental Offsets Policy (DSEWPC 2011), HVO is required to manage the site to maintain or increase these values in-perpetuity.

The key threat to habitat quality at the Hook BA is the invasion of native plant communities by African olive. African olive is considered to be one of the most serious invasive species in the Hunter region because of its ability to completely alter ecosystem structure (Peake 2006). The 'Invasion of Native Plant Communities by African olive (*Olea europaea* subsp. *cuspidata*)' is listed as a key threatening process under the NSW *Biodiversity Conservation Act 2016* (BC Act). African olive is known to fundamentally alter vegetation communities (Cuneo & Leishman 2006) and prevent the regeneration of native species through the formation of a dense mid-canopy that blocks any infiltration of sunlight (NSW Scientific Committee 2011; Peake 2006). Vegetation communities can therefore quickly become altered beyond recognition by this weed, as canopy species senesce and are not replaced. This dense canopy also results in the long-term loss of native species from the soil seedbank, limiting the ability of native plant communities to naturally regenerate in shrub and ground strata.

This Intensive Weed Management Plan focuses primarily on the control of African olive at the Hook BA, due to its ability to alter native vegetation communities and result in the loss of the *Central Hunter Valley Eucalypt Forest and Woodland CEEC* over time, however consideration has been given to other key weed species occurring at the site, including lantana (*Lantana camara*) and prickly pear (*Opuntia species*).

1.2 Aims and Objectives

The key objectives of the Intensive Weed Management Plan will be to:

- Facilitate an initial annual reduction in African olive cover by 30%, with subsequent years also seeking to achieve a 30% or greater reduction.
- Result in the appropriate management of other key weed species on the site.
- Demonstrate HVO's commitment to achieve weed reduction outcomes beyond the existing legal obligations.

1.3 Relationship with other Management Plans and Resources

This management plan is intended to be consistent with, and additional to, the existing HVO Biodiversity Offsets Management Plan (HVO 2019). In addition to this management plan, this document is guided by the following resources:

- Upper Hunter Weed Authority (UHWA) General Biosecurity Duty Control Guidelines
- Hunter Regional Strategic Weed Management Plan 2017-2022 (LLS 2017)
- Department of Primary Industries (DPI) Weedwise website - https://weeds.dpi.nsw.gov.au/
- African Olive Survey report (Rural and Environmental Management 2020).

2 Environmental Context

The Hook Biodiversity Area (BA) is located at 62 Pothana Lane, Lower Belford NSW within the Singleton local government area (LGA). The 158.1 ha property is situated to the south of the Hunter Expressway and directly south of Belford National Park. This property is currently zoned RU1 Primary Production and was historically used for grazing and exhibits signs of selective logging. Livestock were removed from the property in 2016. It is situated in a semi-rural context, surrounded by land use associated with residential, agricultural, tourism and viticultural enterprise.

The majority of the site is covered by a spotted gum - narrow-leaved ironbark - red ironbark open forest, with areas of both grassland and regenerating woodland of moderate ecological condition. This community has been cleared or at least thinned historically as while large canopy trees are present, the majority of canopy trees have a diameter at breast height (DBH) of 20-30cm. Consequently, few hollow bearing trees occur on the site, largely restricted to the larger scattered remnant trees. Most of the vegetation on this site conforms with the CHVEFW CEEC and is expected to provide high quality swift parrot habitat, with records of this species occurring within 2 km of the site. Mature spotted gum (*Corymbia maculata*) nectar resources for this species are abundant across the site.

2.1 Priority Weed Species Recorded on the Site

Survey and mapping of invasive flora species in February 2020 (Rural and Environmental Management 2020) has shown that the Hook BA has been extensively invaded by African olive, with approximately 4170 individuals recorded, and a live crown cover of approximately 21.32 ha. This equates to approximately 14% crown cover of the property, as shown in **Figure 2.1**. However the extent of infestation that will require treatment is much higher, as African olive has been mapped across almost the entire site. It is estimated that approximately 95% of this infestation is found in areas that are greater than 50m from the nearest property boundary. The species has been known, particularly in the Hunter, to spread very rapidly and create a dense monoculture.

Similarly, lantana and prickly pear species were recorded in large numbers across the BA in February 2020 (refer to **Figure 2.2**). Other environmental weeds previously recorded on site include Parramatta grass (*Sporobolus africanus*), scotch thistle (*Onopordum acianthium*) and fireweed (*Senecio madagascariensis*). Most of these infestations occur within the forested areas of the site.

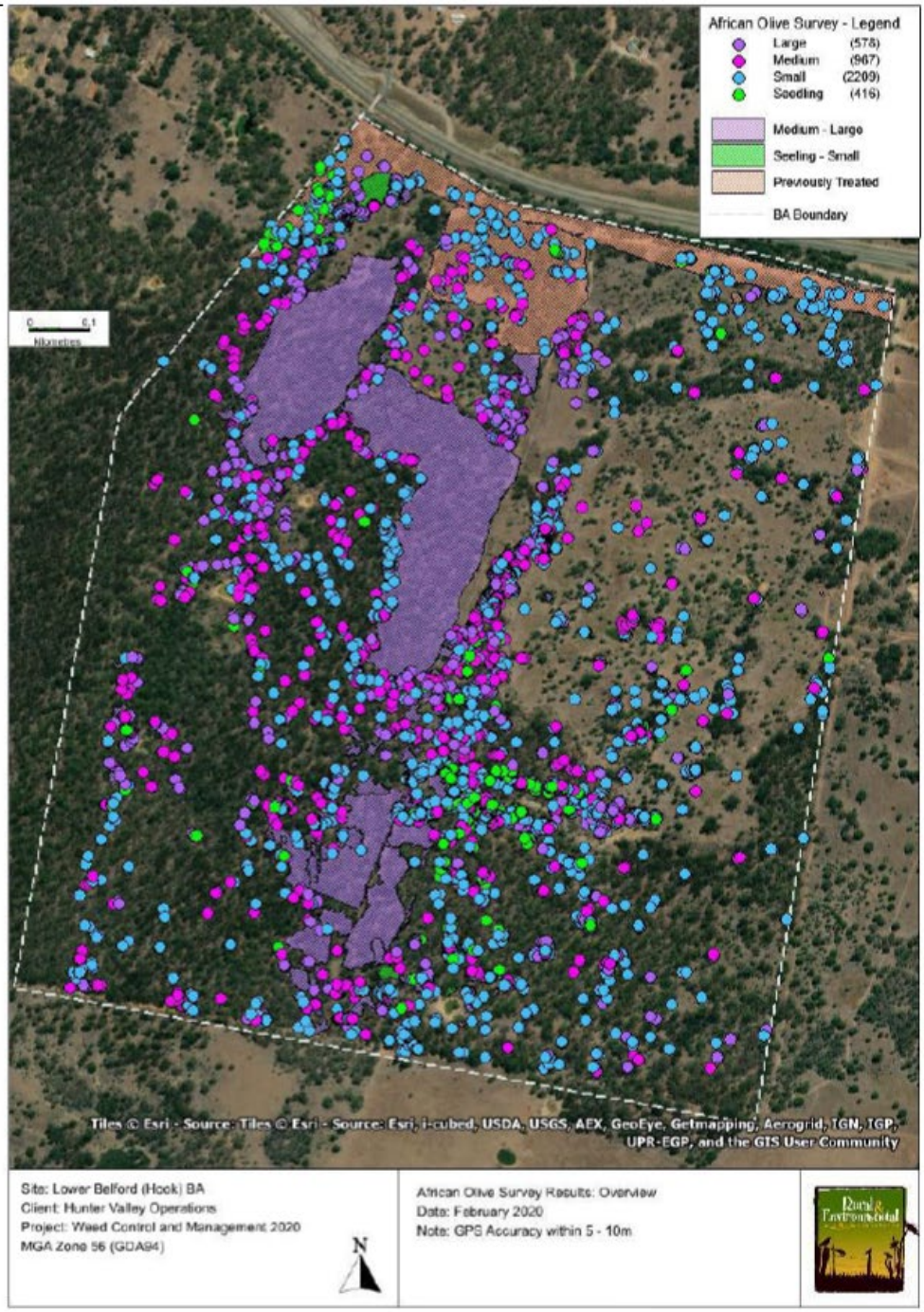

Figure 2.1 African Olive Infestation in Hook BA, February 2020

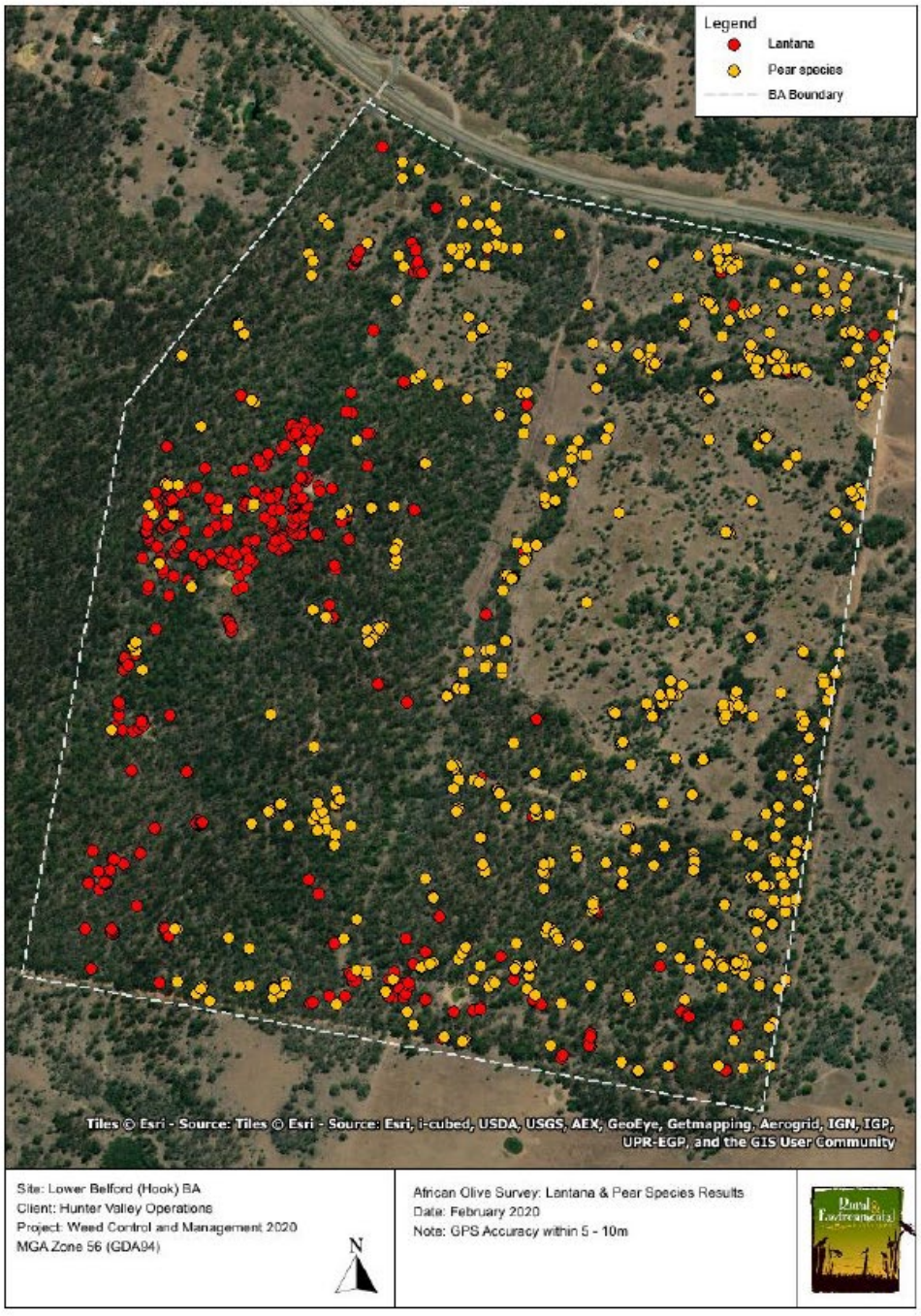

Figure 2.2 Lantana and Prickly Pear Infestation in Hook BA, February 2020

3 Control Guidelines and Obligations

3.1 General Biosecurity Duty

Under the *Biosecurity Act 2015*, all landowners had a responsibility to control noxious weeds on their property, known as a General Biosecurity Duty. Landowners or land managers have a "General Biosecurity Duty" to prevent, eliminate or minimise the biosecurity risk posed or likely to be posed by priority weeds. Priority weeds are plants that have the potential to pose a biosecurity risk to human health, the economy, the liveability of our city and the environment. Recommended measures for the Hunter Region are outlined in the Hunter Regional Strategic Weed Management Plan 2017-2022 (LLS 2017).

Table 3.1 below outlines the Priority Weed Species recorded in the Hook BA and the biosecurity duty and Priority Weed Objective outlined for the Hunter Region.

Table 3.1 Priority Weed Species Recorded in the Hook BA

Priority Weed Species	**Category** ***General Biosecurity Duty***	**Priority Weed Objective**
African olive ***Olea europaea* subsp. *cuspidata***	Regional Recommended Measure (Hunter) *Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce impacts from the plant on priority assets. Land managers prevent spread from their land where feasible. The plant or parts of the plant are not traded, carried, grown or released into the environment*	**Regional Priority Weed Objective**: ASSET PROTECTION Spread should be minimised to protect priority assets.
lantana ***Lantana camara***	Prohibition on dealings. *Must not be imported into the state or sold.*	**State Priority Weed Objective:** ASSET PROTECTION, Additional Species of Concern Spread should be minimised to protect priority assets. Weed of community concern due to agricultural and environmental outcomes.
prickly pear ***Opuntia* species**	Prohibition on dealings. *Must not be imported into the state or sold (except for* Opuntia ficus-indica - *Indian fig).*	**State Priority Weed Objective:** ASSET PROTECTION, Additional Species of Concern Spread should be minimised to protect priority assets. Weed of community concern due to agricultural outcomes.

3.2 UHWA General Biosecurity Duty Control Guideline

Local Control Authorities (Local Councils and County Councils) are responsible for enforcing weed legislation under the Biosecurity Act 2015. Advice from Doug Campbell of the Upper

Hunter Weeds Authority (UHWA) suggests that the current obligation of landowners in relation to managing 'Priority Weeds' is outlined in the UHWA General Biosecurity Duty (GBD) Control Guideline.

Priority Weeds must be controlled in accordance with the General Biosecurity Obligations (GBO) as per the below extract:

The growth and spread of priority plants must be controlled to the extent specified in the following control measures:

2.1 All priority plants within 50 metres of any property boundary or recognised watercourse must be prevented from producing viable seed by either using a registered herbicide as per label and/or mechanically removed (see Note 1).

2.2 On properties where infestations cover an area exceeding 10% of property area, infestations must be reduced by 20% annually. Control measures which may be used are:

- *The application of a registered herbicide as per label, or*
- *Mechanic removal (see Note 1), or*
- *The introduction of perennial grasses and a grazing management program, together with the use of a biological control agent. Occupiers using this method are required to submit a copy of their control plan to Council for approval.*

3.3 Additional Commitments for African Olive

As outlined in the sections above, the invasion of African olive (*Olea europaea* subsp. *cuspidata*) presents a serious weed issue at the Hook BA due to its ability to completely alter ecosystem structure. Additional management commitments are proposed to demonstrate an improvement in site quality values for the swift parrot habitat and the CHVEFW CEEC at the site.

As per the requirements under the *Biosecurity Act 2015* and specific recommendations in the UHWA General Biosecurity Duty (GBD) Control Guideline, as the baseline infestation of African olive exceeds 10% of the property area (approximately 14%), HVO has an obligation to reduce the cover of this weed by 20% each year. Treatment will initially focus on the individuals located within 50 metres of the property boundary, as per these obligations.

However, further to the commitments outlined above, HVO is proposing to undertake control measures beyond its existing obligation to manage African Olive at the Hook BA. Intensive eradication commitments are proposed as follows (and further detailed in **Section 4.0** below):

- Initial works will target an annual reduction of 30% crown cover of African Olive based on mapping results from the February 2020 survey (i.e. approximately 14% crown cover at baseline survey).
- Subsequent years will also seek a 30% or greater reduction in African olive cover.

- The extent of cover of the African Olive infestation within the Hook BA will be mapped annually from February 2020 until monthly inspections and additional surveys determine that treatment of the population of African olive within the BA has resulted in cover that is at or below 5% of the property area (refer to **Table 6.2**).

4 Management Actions

4.1 Priority Weed Management Actions

Table 4.1 below outlines the proposed management actions to manage the Priority Weeds identified at the Hook BA. This information is consistent with Table 16 of the HVO Biodiversity Areas Management Plan that lists the priority and environmental weed species to be controlled, their nomination as a Weed of National Significance (WONS), control methods, timing and intensity required to manage these weeds. Further guidance regarding control strategies, timing, herbicide options and diagnostic information can be found at NSW Weedwise (DPI 2020).

Table 4.1 Priority Weed Management Actions

Priority Weed Species	WONS	Control Method	Control Period and Intensity
African olive ***Olea europaea* subsp. *cuspidata***	No	Spot spray, basal bark or cut stump application with registered herbicide	Actively growing From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if identified through monitoring events.
lantana ***Lantana camara***	Yes	Chemical – Spot spray and cut stump method with registered herbicide. Manual removal – hand pulling small infestations, bulldozing or slashing for large infestations Biological control – 19 biological control agents are established in some areas, use concurrently with other methods	All year (small plants when actively growing) or between February and the first frost (mature plants >2m) From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if identified through monitoring events.

Priority Weed Species	WONS	Control Method	Control Period and Intensity
prickly pear *Opuntia* species	Yes	Spot spray with registered herbicide. Biological control Cactoblastis (*Cactoblastis cactorum*) and Cochineal (*Dactylopius* spp.) – better suited to large infestations or inaccessible areas.	All year – control period. From Year 1 to Year 4, at least one control event per year with additional events as required. Ongoing maintenance, minimum of one control event per year if identified through monitoring events.

4.2 Additional Actions for African Olive

HVO proposes to undertake the management actions outlined in **Table 4.2** to ensure that African olive is reduced and suppressed over time to improve the quality of the CHVEFW CEEC and swift parrot habitat on the Hook BA following its establishment as a formal offset site. These measures aim to produce an outcome above and beyond HVO's obligations as outlined in the sections above, including the requirement to reduce infestations of priority weeds that are found at densities in excess of 10% of the property by 20% annually.

In the first year, to ensure compliance with the General Biosecurity Obligations, HVO will initially target mature African olives found within 50 m of the property boundaries. Subsequent campaigns will target the more dense areas and areas containing the large mature seeding individuals to reduce the volume of seed being produced within the property. The additional time will allow the identified seedlings to grow taller to enable them to be readily identified and removed prior to reaching maturity. At least two control treatments should be undertaken per year. Further removal of the African Olive from the BA will be as per the weed control strategies proposed in the HVO Biodiversity Areas Management Plan.

Where appropriate, HVO will liaise with neighbouring landholders and government authorities such as the Upper Hunter Weeds Authority, Local Land Services and/or National Parks and Wildlife Service to ensure control methods are effective in the context of the wider locality. This will also assist in ensuring that ongoing control methods consider the contemporary best-practice methods in the control of African olive.

Table 4.2 Proposed Management Actions for African Olive

Aim	Timeframe	Management Actions	Methods
Limit spread of African olive outside property	Immediately	Remove all individuals excluding seedlings of African olive within 50m of the property boundary or recognised water course to restrict opportunities to produce viable seed in these areas	Seedlings and small plants can be controlled using spot foliar spray with the appropriate registered herbicide. Medium to large individuals can be controlled via basal bark spraying or cut and paint (cut stump) method. Use the cut stump method on established plants up to 10 cm DBH. Use stem injection of registered herbicide for individuals with stems greater than 10cm DBH. Herbicide options for this species are outlined on the NSW Weedwise website (DPI 2020). The cut biomass will be left in situ to provide cover for small birds. Weed control methods should aim to control plants before they fruit.
Control of mature African olive individuals to reduce seed production	Short term	Concentrate efforts on dense areas containing medium and large mature individuals of African olive occurring within the woodland, regeneration and grassland areas	
Identification and control of younger African olive individuals	Medium term	Concentrate efforts on remaining individuals of African olive occurring within the woodland areas regeneration and grassland areas	
Continued control and suppression	Long term (once African olive population is <5% cover)	Minimum of one control event per year if identified through monitoring or inspections	
Reporting and compliance	Annually	All management actions must be recorded and reported in the annual EPBC compliance report for the BA.	Should a control event not be required or conditions are unsuitable (due to dry plants under stress) then evidence of this will be provided in the Annual Report. The Pesticides Regulation 2017 requires all commercial pesticide users (that includes farmers, leaseholders and spray contractors) to keep records on their pesticide application.

5 Performance Indicators

Management actions will be undertaken to satisfy the Performance Criteria outlined in **Table** 5.1. In order to ensure delivery of the proposed commitments, a range of further actions are to be undertaken in the event that it becomes apparent that performance indicators are not being met. A Trigger Action and Response Plan is therefore provided alongside the performance indicators.

Note that the nominated crown cover extents does not include any regrowth seedlings from within the treated areas. This is in line with the intent in which the GBD Control Guidelines were prepared. As outlined in **Section 4.2**, the focus is on removing the mature individuals to reduce the annual seed production that may contribute to the seedbank, be dispersed by vectors and outcompete CHVEFW CEEC species. In the short term, immature individuals offer less of a threat to CHVEFW CEEC and do not contribute to the spread of the species. These smaller plants will be removed in subsequent weed campaigns prior to their maturity.

Table 5.1 Performance Criteria and Trigger Action and Response Plan

Timeframe	Performance Criteria	Trigger	Potential Corrective Action
Immediately	30% reduction in crown cover of African olive after the first year of treatment	Annual weed mapping indicates that the crown cover extent has not reduced by 30% or more (i.e. is at approximately 9.8% cover or less) after the first year of treatment	If treatment focused on boundary areas does not result in 30% or more reduction in crown cover, then treatment must extend into other areas of the property outside the boundary areas until the performance criteria is met
Medium term	30% reduction in crown cover of African olive in subsequent years of treatment	Annual weed mapping indicates that the crown cover extent has not reduced by 30% or more since the previous year	Additional treatment required to meet the criteria
	African olive crown cover does not comprise more than 20% in any stratum	Monitoring or inspections indicate that African olive crown cover constitutes more than 20% in any stratum	Intensive treatment is required to reduce crown cover below 20% in any stratum
	The vegetation community continues to be readily identifiable as the CHVEFW CEEC	The vegetation community is unrecognisable as CHVEFW CEEC due to weed cover altering community structure	In addition to strong corrective weed control actions, re-planting or re-seeding must be considered to actively revegetate the BA to a point where it is recognisable as the CEEC
Long term	The crown cover of African olive is 5% or less	Annual weed mapping indicates that the crown cover extent is more than 5%	Intensive treatment continues until the criteria is met

Timeframe	Performance Criteria	Trigger	Potential Corrective Action
	The vegetation community continues to be readily identifiable as the CHVEFW CEEC	The vegetation community is unrecognisable as CHVEFW CEEC due to weed cover altering community structure	In addition to strong corrective weed control actions, re-planting or re-seeding must be considered to actively revegetate the BA to a point where it is recognisable as the CEEC
	African olive continues to be controlled and suppressed	Monitoring or inspections indicate that African olive crown cover increases over two consecutive years	A minimum of one annual treatment is undertaken until African olive cover does not increase over two consecutive years

6 Monitoring Program

6.1 Priority Weed Monitoring

Several types of monitoring protocols will be followed in regular condition assessments and inspections of the Hook BA. The relevant existing monitoring methodologies will capture the progress of weed control treatments, identify any failings or new weeds, and monitor the overall composition and health of the ecosystem, in addition to results observed through a dedicated weed monitoring and mapping event annually. The monitoring will provide an important feedback loop to ensure the weed management actions are resulting in the performance indicators as outlined in **Section 5.0**.

The relevant existing monitoring methodologies are summarised below in **Table 6.1**.

Table 6.1 Monitoring Methodologies for Priority Weeds

Monitoring Type	Parameters Monitored	Frequency of Monitoring	Monitoring Method	Notes
Ecological Condition Assessment	Vegetation community composition, species diversity, canopy cover	Biennially in Spring from 2021	Field Survey Monitoring; BAM	Comment should be made regarding weed cover, weed species present, and if weed cover is having a detrimental effect on community composition.
Rapid Condition Assessment	Key habitat components, threatening processes, disturbance	Annually in Spring	Field Inspection; Checklist, observation	Weeds should be considered as part of weed abundance attribute, and condition assessment should consider whether weed treatment methods (herbicide application) is having a detrimental effect on existing vegetation.
Property inspection	Identify emerging threats	Biannually	Site inspection	New infestations of existing weeds or infestation of new weeds to the site should be recorded. General assessment of weed treatment efficacy should be made.

6.2 Targeted Monitoring of African Olive

Table 6.2 below outlines the specific monitoring methods proposed to measure the success m² or otherwise of management actions for reducing the cover of African olive (and other priority weeds) at the Hook BA. These results are to be compared to the Performance Indicators in **Section 5.0** and appended to the annual EPBC Compliance Report (refer to **Section 7.0**).

Table 6.2 Targeted Monitoring of African Olive Cover

Monitoring Type	Parameters Monitored	Frequency of Monitoring	Monitoring Method	Notes
Weed Cover Assessment	Crown cover of African olive and other priority weeds	Annually from February 2021, then as per **Table 6.1** once 5% crown cover of African olive is reached	Field Survey	The cover of African olive, and other priority weeds, is to be recorded by a team walking transects across the entire property. Each individual will be recorded by GIS as outlined in the Weed Cover Mapping below. The individuals will be ranked into one of four size categories. The overall olive coverage and % property coverage is determined. The following crown coverage is allocated to each category: Large: 3.5m² Medium: 2m² Small: 1m² Seedling: 0.1m²

Monitoring Type	Parameters Monitored	Frequency of Monitoring	Monitoring Method	Notes
Weed Cover Mapping	Size and location of infestations	Annually from February 2021, then as per **Table 6.1** once 5% crown cover of African olive is reached	Field Survey; GIS mapping, transect based assessment	Point and polygon records of African olive and other priority weed species are to be recorded for individuals and area infestations respectively. The data shall be displayed spatially to show the location and size of infestations over time. Methods will include: • 40 m transects are to be walked across the site, recording count and location of individual and area infestations of African olive and other priority weeds. • Point/count is to be recorded for small or medium to large individuals. • Polygon/area is to be recorded for extensive patches or an area of seedlings. • Polygon/area is also to be recorded for areas that have been previously treated. • A summary of results and weed mapping products are to be generated, with comparison to previous monitoring results.

7 Reporting

7.1 Annual Reporting

All actions undertaken as part of this weed management plan will be reported in the annual EPBC compliance report for the Hook BA. The results of the weed mapping and cover assessment monitoring shall be appended to the report, where relevant.

8 Roles and Responsibilities

Environmental management at the BA will be the responsibility of all employees and contractors, with the Environment and Community Coordinator having overall responsibility for environmental management of the operation. Environmental roles and responsibilities related to weed control and biodiversity management are outlined in **Table 8.1**.

Table 8.1 Roles and Responsibilities

Role	Accountabilities for this document
Environment and Community Manager	• Approve appropriate resources for the effective implementation of this plan.
Environment and Community Coordinator (or delegate)	• Schedule weed control and restoration activities as per this plan. • Coordinate the biodiversity and weed cover monitoring requirements of this plan. • Confirm that the personnel involved in carrying out and monitoring of the activities required under this plan are suitably qualified, licensed and experienced to undertake the task. • Confirm all internal and external compliance reporting requirements are met. • Periodically review monitoring results and progress against targets and performance indicators in accordance with the requirements of this plan. • Assess the effectiveness of the management strategies and implement corrective actions as required. • Coordinate biodiversity and management related incident investigations and reporting as required by legislation and internal standards and guidelines.
All employees and contractors	• Comply with all requirements in this Plan. • Report all potential environmental incidents to the Environment and Community Coordinator immediately.

9 Consultation

The final draft Intensive Weed Management Plan for the Hook Biodiversity Area was provided to the Upper Hunter Weeds Authority (UHWA) who authored the UHWA General Biosecurity Duty Control Guidelines. The UHWA was asked to review the management strategies proposed in this document and comment regarding the compliance of the proposed strategies with the guidelines.

While the UHWA commented that the guidelines are not compliance documents and were designed to assist landowners with recommendations on managing their properties, their review stated that the Weed Management Plan for the Hook Biodiversity Area exceeded the suggested management requirements of the UHWA General Biosecurity Duty Control Guidelines (Figure 9).

From: admin@uhwa.org.au <admin@uhwa.org.au>
Sent: Friday, 19 June 2020 1:46 PM
To: Lloyd, Michael (Hunter Valley Operations - AU) <Michael.Lloyd@hvo.com.au>
Subject: RE: HVO Hook Offset Weed Management Plan

Michael
Sorry about the delay and getting back to you.

I have reviewed the HVO Hook Offset Weed Management Plan and it provides a comprehensive control program of the invasive plants listed in the plan.
The plan exceeds the requirements of the UHWA General Biosecurity Duty Control Guidelines in regards to the control of invasive plants in the area of operation of the Upper Hunter County Council.

Doug Campbell
Works Coordinator
Upper Hunter Weeds Authority
PO Box 122 MUSWELLBROOK NSW 2333
Ph 02 65410323
Mobile: 0408 683 490
admin@uhwa.org.au

UHWA HUNTER CENTRAL COAST weeds NSW not space 4 weeds

Figure 9 Email response of the outcomes of the review of this document by the UHWA, June 2020

10 References

- Cuneo P, Leishman MR (2006) African Olive (*Olea europaea* subsp. *cuspidata*) as an environmental weed in eastern Australia: a review. *Cunninghamia* 9, 545-577.
- Department of Primary Industries (DPI) (2020) *NSW Weedwise*. Accessed May 2020 from < https://weeds.dpi.nsw.gov.au >.
- EMM (2018) Hook Environmental Offset Assessment. Report prepared for Hunter Valley Operations.
- Hunter Valley operations (HVO) (2019) HVO Biodiversity Areas - Management Plan. October 2019.
- Local Land Services (LLS) (2017) Hunter Regional Strategic Weed Management Plan 2017-2022. June 2017.
- NSW Scientific Committee (2011). Invasion of native Plant Communities by African Olive *Olea europaea L. subsp. cuspidata* (Wall ex G. Don Ciferri) – key threatening process listing. Accessed May 2020 from < https://www.environment.nsw.gov.au/determinations/africanoliveFD.htm >.
- Peake, T. C. (2006) *The Vegetation of the Central Hunter Valley, New South Wales. A Report on the Findings of the Hunter Remnant Vegetation Project*. Final Draft Version 1. (Hunter — Central Rivers Catchment Management Authority. Paterson, NSW).
- Rural and Environmental Management (2020) Lower Belford (Hook) African Olive Survey February 2020. Prepared for Hunter Valley Operations, March 2020.
- Upper Hunter Weeds Authority. (UHWA) (undated) UHWA General Biosecurity Duty Control Guideline. Accessed May 2020

Appendix D Land classification and zoning

D.1 Hook land classification and zoning

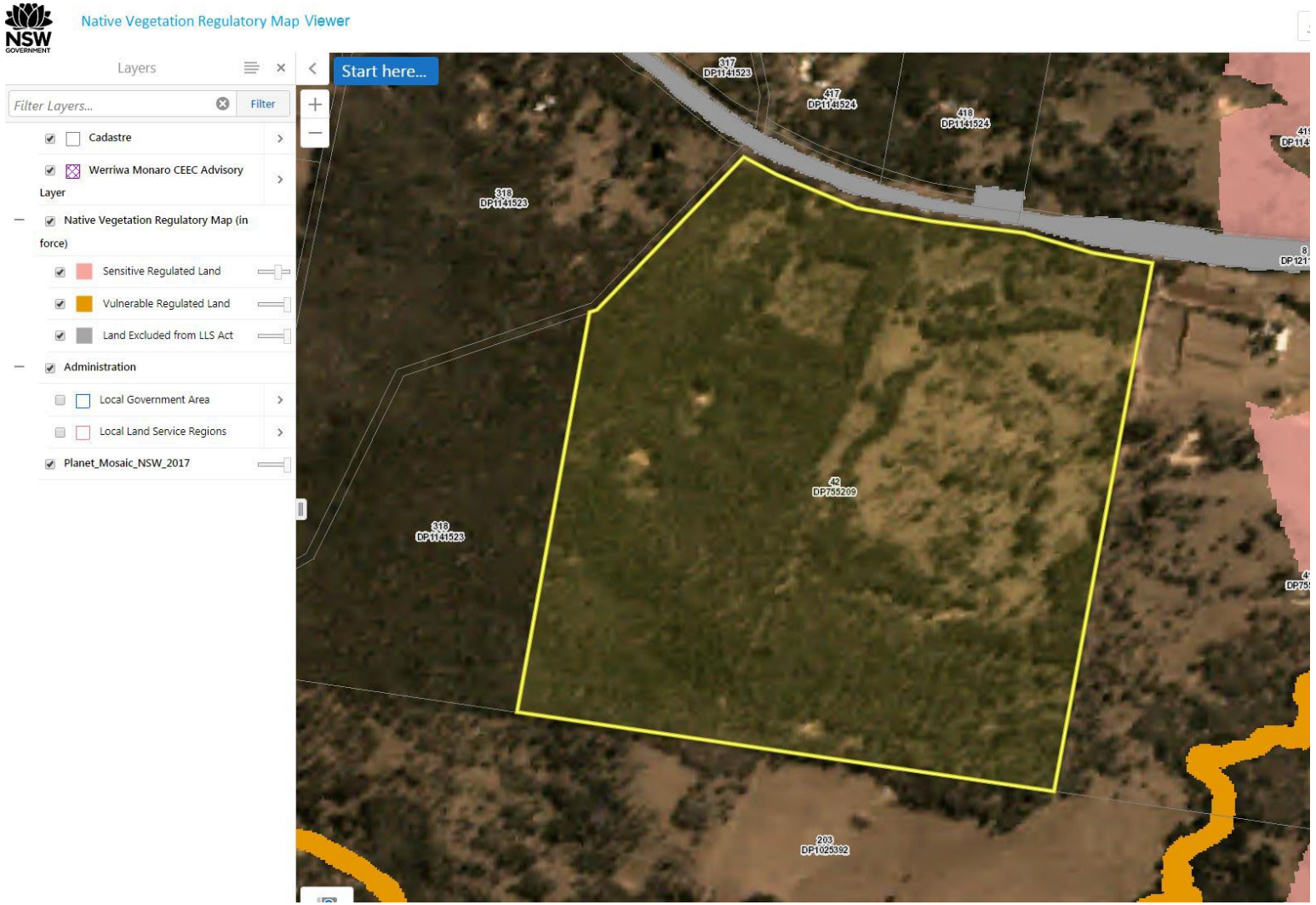

Plate 1 Native vegetation regulatory map output for Hook

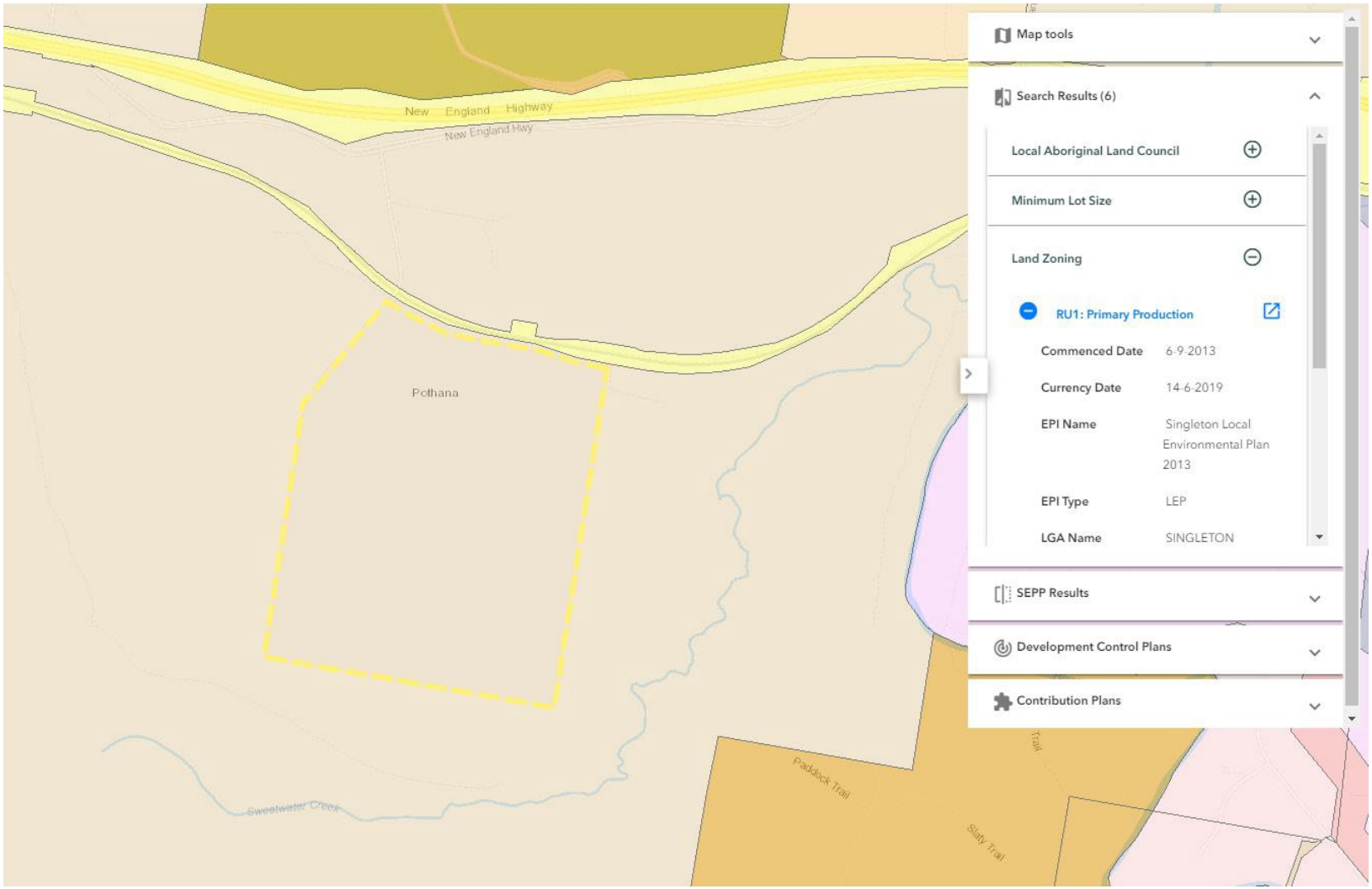

Plate 2 Rural (RU1) zoning at Hook

Appendix E Priority weeds for the Hunter region

Priority Weeds for the Hunter – as of 19 May 2023
Note: This region includes the local council areas of Cessnock, Dugong, Lake Macquarie, Maitland, Mid-Coast, Muswellbrook, Newcastle, Port Stephens, Singleton and Upper Hunter

Weed	Duty
All plants	**General Biosecurity Duty** *All pest plants are regulated with a **general biosecurity duty** to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.*
Aaron's beard prickly pear *Opuntia leucotricha*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Aaron's beard prickly pear *Opuntia leucotricha*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
African boxthorn *Lycium ferocissimum*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*

African boxthorn *Lycium ferocissimum*	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except the core infestation which includes parts of: Muswellbrook Local Government Area, Upper Hunter Local Government Area. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
African lovegrass *Eragrostis curvula*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*

African olive *Olea europaea* subsp. *cuspidata*	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except the core infestation which includes parts of: Dungog Local Government Area, Lake Macquarie Local Government Area Maitland Local Government Area, MidCoast Local Government Area, Port Stephens Local Government Area, Singleton Local Government Area. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Alligator weed *Alternanthera philoxeroides*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Alligator weed *Alternanthera philoxeroides*	**Biosecurity Zone** The Alligator Weed Biosecurity Zone is established for all land within the state except land in the following regions: Greater Sydney; Hunter (but only in the local government areas of City of Lake Macquarie, City of Maitland, City of Newcastle or Port Stephens). *Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone*

Alligator weed *Alternanthera philoxeroides*	**Regional Recommended Measure** An Alligator Weed Biosecurity Zone is established for all land within the Hunter Local Land Services region except land in the following local government areas: Lake Macquarie Local Government Area, Maitland Local Government Area, Newcastle Local Government Area, Port Stephens Local Government Area. *Entire Hunter Local Land Services region: A person must not, import into the State or sell. Within the biosecurity zone: If the weed is part of a new infestation of the weed on the land, notify the local control authority for the land as soon as practicable. Eradicate the weed or, if that is not practicable, destroy as much of the weed as is practicable and suppress the spread of any remaining weed. Outside the biosecurity zone: Land managers should mitigate spread of the plant from their land. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Anchored water hyacinth *Eichhornia azurea*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Arrowhead *Sagittaria calycina* var. *calycina*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*

Asparagus fern *Asparagus virgatus*	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except the core infestation which includes parts of: MidCoast Local Government Area. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Athel pine *Tamarix aphylla*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Bellyache bush *Jatropha gossypiifolia*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Bitou bush *Chrysanthemoides monilifera* subsp. *rotundata*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Bitou bush *Chrysanthemoides monilifera* subsp. *rotundata*	**Biosecurity Zone** The Bitou Bush Biosecurity Zone is established for all land within the State except land within 10 kilometres of the mean high water mark of the Pacific Ocean between Cape Byron in the north and Point Perpendicular in the south. *Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone*

Bitou bush *Chrysanthemoides monilifera* subsp. *rotundata*	**Regional Recommended Measure** A Bitou Bush Biosecurity Zone is established for all land within the Hunter Local Land Services Region except land within 10 kilometres of the mean high water mark of the Pacific Ocean, which includes parts of: Lake Macquarie Local Government Area, MidCoast Local Government Area, Newcastle Local Government Area, Port Stephens Local Government Area. *Entire Hunter Local Land Services region: A person must not, import into the State or sell. Within the biosecurity zone: If the weed is part of a new infestation of the weed on the land, notify the local control authority for the land as soon as practicable. Eradicate the weed or, if that is not practicable, destroy as much of the weed as is practicable and suppress the spread of any remaining weed. Outside the biosecurity zone: Land managers should mitigate spread of the plant from their land. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Black knapweed *Centaurea* x *moncktonii*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Black locust *Robinia pseudoacacia*	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except the core infestation which includes all urban centres of the Hunter region. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*

Black willow *Salix nigra*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Blackberry *Rubus fruticosus* species aggregate	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.* **All species in the Rubus fruiticosus species aggregate have this requirement, except for the varietals Black Satin, Chehalem, Chester Thornless, Dirksen Thornless, Loch Ness, Murrindindi, Silvan, Smooth Stem, and Thornfree**
Blackberry *Rubus fruticosus* species aggregate	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Blind cactus *Opuntia rufida*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Blind cactus *Opuntia rufida*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Blue heliotrope *Heliotropium amplexicaule*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Blue periwinkle *Vinca major*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*

Boneseed *Chrysanthemoides monilifera* subsp. *monilifera*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Boneseed *Chrysanthemoides monilifera* subsp. *monilifera*	**Control Order** Boneseed Control Zone: Whole of NSW *Boneseed Control Zone (Whole of NSW): Owners and occupiers of land on which there is boneseed must notify the local control authority of new infestations; immediately destroy the plants; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of boneseed must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant.*
Boxing glove cactus *Cylindropuntia fulgida* var. *mamillata*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Boxing glove cactus *Cylindropuntia fulgida* var. *mamillata*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Bridal creeper *Asparagus asparagoides*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.* ***this requirement also applies to the Western Cape form of bridal creeper**

Bridal creeper *Asparagus asparagoides*	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except the core infestation which includes: Dungog Local Government Area, Lake Macquarie Local Government Area, Cessnock Local Government Area, MidCoast Local Government Area. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Bridal veil creeper *Asparagus declinatus*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Broad-leaf pepper tree *Schinus terebinthifolius*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Broomrapes *Orobanche* species	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species of Orobanche are Prohibited Matter in NSW, except Clover broomrape, Orobanche minor and Australian broomrape, Orobanche cernua var. australiana.**

Brown-spined Hudson pear *Cylindropuntia tunicata*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Bunny ears cactus *Opuntia microdasys*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Bunny ears cactus *Opuntia microdasys*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Cabomba *Cabomba caroliniana*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Cabomba *Cabomba caroliniana*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Camphor laurel *Cinnamomum camphora*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Cane cactus *Austrocylindropuntia cylindrica*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.* **All species in the Austrocylindropuntia genus have this requirement**

Cane cactus *Austrocylindropuntia cylindrica*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Cape broom *Genista monspessulana*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Cape broom *Genista monspessulana*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Cat's claw creeper *Dolichandra unguis-cati*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Cat's claw creeper *Dolichandra unguis-cati*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Chicken dance cactus *Opuntia schickendantzii*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Chicken dance cactus *Opuntia schickendantzii*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Chilean needle grass *Nassella neesiana*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*

Chilean needle grass *Nassella neesiana*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Chinese celtis *Celtis sinensis*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Chinese knotweed *Persicaria chinensis*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Chinese tallow tree *Triadica sebifera*	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except the core infestation which includes all urban centres of the Hunter region. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*

Chinese violet *Asystasia gangetica* subsp. *micrantha*	**Control Order** *Owners and occupiers of land on which there is Chinese violet must notify the local control authority for the area if the Chinese violet is part of a new infestation on the land, destroy all Chinese violet on the land ensuring that subsequent generations of Chinese violet are destroyed; and keep the land free of Chinese violet. A person who deals with a carrier of Chinese violet must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant on the land, or on or in a carrier.*
Climbing asparagus *Asparagus africanus*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Climbing asparagus *Asparagus africanus*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Climbing asparagus fern *Asparagus plumosus*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Cockspur coral tree *Erythrina crista-galli*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Common pear *Opuntia stricta*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Common pear *Opuntia stricta*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*

Coolatai grass *Hyparrhenia hirta*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Coral creeper *Barleria repens*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Cotoneaster *Cotoneaster glaucophyllus*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Crofton weed *Ageratina adenophora*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
East Indian hygrophila *Hygrophila polysperma*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*

Espartillo - broad kernel *Amelichloa caudata*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Espartillo - narrow kernel *Amelichloa brachychaeta*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Eurasian water milfoil *Myriophyllum spicatum*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Eve's needle cactus *Austrocylindropuntia subulata*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.* **All species in the Austrocylindropuntia genus have this requirement**
Eve's needle cactus *Austrocylindropuntia subulata*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Fireweed *Senecio madagascariensis*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Flax-leaf broom *Genista linifolia*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Foxtail fern *Asparagus densiflorus*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*

Frogbit *Limnobium laevigatum*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species of Limnobium are Prohibited Matter**
Galenia *Galenia pubescens*	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except the core infestation which includes parts of: Lake Macquarie Local Government Area, Maitland Local Government Area, Muswellbrook Local Government Area, Newcastle Local Government Area, Singleton Local Government Area, Upper Hunter Local Government Area. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Gamba grass *Andropogon gayanus*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Giant devil's fig *Solanum chrysotrichum*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*

Giant Parramatta grass *Sporobolus fertilis*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Giant rat's tail grass *Sporobolus pyramidalis*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Giant reed *Arundo donax*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Glory lily *Gloriosa superba*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Gorse *Ulex europaeus*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Gorse *Ulex europaeus*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*

Green cestrum *Cestrum parqui*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Grey sallow *Salix cinerea*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Ground asparagus *Asparagus aethiopicus*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Ground asparagus *Asparagus aethiopicus*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Groundsel bush *Baccharis halimifolia*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Harrisia cactus *Harrisia* species	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Hawkweeds *Pilosella* species	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species in the genera *Pilosella* and *Hieracium* are Prohibited Matter except for *Hieracium murorum*.**

Honey locust *Gleditsia triacanthos*	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except the core infestation which includes: Lake Macquarie Local Government Area, Newcastle Local Government Area. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Horsetails *Equisetum* species	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.* **This Regional Recommended Measure applies to *Equisetum arvense***
Hudson pear *Cylindropuntia pallida*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Hudson pear *Cylindropuntia pallida*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Hydrocotyl *Hydrocotyle ranunculoides*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*

Hygrophila *Hygrophila costata*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Hymenachne *Hymenachne amplexicaulis* and hybrids	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Hymenachne *Hymenachne amplexicaulis* and hybrids	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Karoo acacia *Vachellia karroo*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Kidney-leaf mud plantain *Heteranthera reniformis*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Kochia *Bassia scoparia*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **Excluding the subspecies *trichophylla***
Koster's curse *Clidemia hirta*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*

Kudzu *Pueraria lobata*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Lagarosiphon *Lagarosiphon major*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Lantana *Lantana camara*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Lantana *Lantana camara*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Leaf cactus *Pereskia aculeata*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Long-leaf willow primrose *Ludwigia longifolia*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*

Ludwigia *Ludwigia peruviana*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Madeira vine *Anredera cordifolia*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Mahonia *Berberis lomariifolia*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Mesquite *Prosopis* species	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.* **All species in the genus *Prosopis* have this requirement**
Mexican feather grass *Nassella tenuissima*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Miconia *Miconia* species	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species of *Miconia* are Prohibited Matter in NSW**
Mikania vine *Mikania micrantha*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* ***all species in the genus *Mikania* are Prohibited Matter in NSW**

Mimosa *Mimosa pigra*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Ming asparagus fern *Asparagus macowanii*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Mistflower *Ageratina riparia*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Mother-of-millions *Bryophyllum* species	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Mysore thorn *Caesalpinia decapetala*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Nodding thistle *Carduus nutans* subsp. *nutans*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*

Ox-eye daisy *Leucanthemum vulgare*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Pampas grass *Cortaderia* species	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except the core infestation which includes parts of: Lake Macquarie Local Government Area. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Parkinsonia *Parkinsonia aculeata*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Parkinsonia *Parkinsonia aculeata*	**Control Order** Parkinsonia Control Zone: Whole of NSW *Parkinsonia Control Zone (Whole of NSW): Owners and occupiers of land on which there is parkinsonia must notify the local control authority of new infestations; immediately destroy the plants; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of parkinsonia must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant.*

Parthenium weed *Parthenium hysterophorus*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Parthenium weed *Parthenium hysterophorus*	**Prohibition on certain dealings** *The following equipment must not be imported into NSW from Queensland: grain harvesters (including the comb or front), comb trailers (including the comb or front), bins used for holding grain during harvest operations, augers or similar for moving grain, vehicles used to transport grain harvesters, support vehicles driven in paddocks during harvest operations, mineral exploration drilling rigs and vehicles used to transport those rigs, unless set out as an exception in Division 5, Part 2 of the Biosecurity Order (Permitted Activities) 2017*
Paterson's curse *Echium plantagineum*	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except the core infestation which includes parts of: Dungog Local Government Area, Maitland Local Government Area, Muswellbrook Local Government Area, Singleton Local Government Area, Upper Hunter Local Government Area. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*

Plume poppy *Bocconia frutescens*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Pond apple *Annona glabra*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Prickly acacia *Vachellia nilotica*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Prickly pears - Austrocylindropuntias *Austrocylindropuntia* species	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.* **All species in the Austrocylindropuntia genus have this requirement**
Prickly pears - Austrocylindropuntias *Austrocylindropuntia* species	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Prickly pears - Cylindropuntias *Cylindropuntia* species	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.* **All species in the Cylindropuntia genus have this requirement**
Prickly pears - Cylindropuntias *Cylindropuntia* species	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*

Prickly pears - Opuntias *Opuntia* species	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.* **For all Opuntia species except for *Opuntia ficus-indica* (Indian fig).**
Prickly pears - Opuntias *Opuntia* species	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.* **This Regional Recommended Measure applies to all species of Opuntia except for *Opuntia ficus-indica.* (Indian fig).**
Rattlepod *Crotalaria beddomeana*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Rhus tree *Toxicodendron succedaneum*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Riverina pear *Opuntia elata*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Riverina pear *Opuntia elata*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Rope pear *Cylindropuntia imbricata*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.* **All species in the Cylindropuntia genus have this requirement**

Rope pear *Cylindropuntia imbricata*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Rubber vine *Cryptostegia grandiflora*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Sagittaria *Sagittaria platyphylla*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Sagittaria *Sagittaria platyphylla*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Salvinia *Salvinia molesta*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*

Salvinia *Salvinia molesta*	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except the core infestation which includes parts of: Lake Macquarie Local Government Area, MidCoast Local Government Area, Port Stephens Local Government Area. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.* **This Regional Recommended Measure applies to *Salvinia molesta* and *Salvinia minima***
Scotch broom *Cytisus scoparius* subsp. *scoparius*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Scotch broom *Cytisus scoparius* subsp. *scoparius*	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except the core infestation which includes parts of: MidCoast Local Government Area, Upper Hunter Local Government Area. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*

Sea spurge *Euphorbia paralias*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Senegal tea plant *Gymnocoronis spilanthoides*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Serrated tussock *Nassella trichotoma*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Serrated tussock *Nassella trichotoma*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Siam weed *Chromolaena odorata*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Sicilian sea lavender *Limonium hyblaeum*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*

Sicklethorn *Asparagus falcatus*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Silverleaf nightshade *Solanum elaeagnifolium*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Silverleaf nightshade *Solanum elaeagnifolium*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Smooth tree pear *Opuntia monacantha*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Smooth tree pear *Opuntia monacantha*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Snakefeather *Asparagus scandens*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Snakefeather *Asparagus scandens*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*

Spiny rush *Juncus acutus*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Spongeplant *Limnobium spongia*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species of *Limnobium* are Prohibited Matter**
Spotted knapweed *Centaurea stoebe* subsp. *micranthos*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
St. John's wort *Hypericum perforatum*	**Regional Recommended Measure** An exclusion zone is established for all land in the region, except parts of: MidCoast Local Government Area, Muswellbrook Local Government Area, Upper Hunter Local Government Area. *Entire Hunter Local Land Services region: Land managers should mitigate the risk of the plant being introduced to their land. Exclusion zone: Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Core infestation: Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*

Sticky nightshade *Solanum sisymbriifolium* *Regional recommended measure for Central Tablelands from February 2020*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Tiger pear *Opuntia aurantiaca*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Tiger pear *Opuntia aurantiaca*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Tree-of-heaven *Ailanthus altissima*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Tropical soda apple *Solanum viarum*	**Control Order** Tropical Soda Apple Control Zone: Whole of NSW *Tropical Soda Apple Control Zone (Whole of NSW): Owners and occupiers of land on which there is tropical soda apple must notify the local control authority of new infestations; destroy the plants including the fruit; ensure subsequent generations are destroyed; and ensure the land is kept free of the plant. A person who deals with a carrier of tropical soda apple must ensure the plant (and any seed and propagules) is not moved from the land; and immediately notify the local control authority of the presence of the plant on the land, or on or in a carrier.*
Velvety tree pear *Opuntia tomentosa*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*

Velvety tree pear *Opuntia tomentosa*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Water caltrop *Trapa* species	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species in the *Trapa* genus are Prohibited Matter in NSW**
Water hyacinth *Eichhornia crassipes*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*
Water hyacinth *Eichhornia crassipes*	**Biosecurity Zone** The Water Hyacinth Biosecurity Zone applies to all land within the State, except for the following regions: Greater Sydney or North Coast, North West (but only the local government area of Moree Plains), Hunter (but only in the local government areas of City of Cessnock, City of Lake Macquarie, MidCoast, City of Maitland, City of Newcastle or Port Stephens), South East (but only in the local government areas of Eurobodalla, Kiama, City of Shellharbour, City of Shoalhaven or City of Wollongong). *Within the Biosecurity Zone this weed must be eradicated where practicable, or as much of the weed destroyed as practicable, and any remaining weed suppressed. The local control authority must be notified of any new infestations of this weed within the Biosecurity Zone*

Water hyacinth *Eichhornia crassipes*	**Regional Recommended Measure** A Water Hyacinth Biosecurity Zone, is established for all land within the Hunter Local Land Services region except land in the following local government areas: Cessnock Local Government Area, Lake Macquarie Local Government Area, MidCoast Local Government Area, Maitland Local Government Area, Newcastle Local Government Area, Port Stephens Local Government Area. *Entire Hunter Local Land Services region: A person must not, import into the State or sell. Within the biosecurity zone: If the weed is part of a new infestation of the weed on the land, notify the local control authority for the land as soon as practicable. Eradicate the weed or, if that is not practicable, destroy as much of the weed as is practicable and suppress the spread of any remaining weed. Outside the biosecurity zone: Land managers should mitigate spread of the plant from their land. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Water lettuce *Pistia stratiotes*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Water soldier *Stratiotes aloides*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*
Water star grass *Heteranthera zosterifolia*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant. Notify local control authority if found.*
Wheel cactus *Opuntia robusta*	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.*

Wheel cactus *Opuntia robusta*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
White blackberry *Rubus niveus*	**Regional Recommended Measure** *Notify local control authority if found. Land managers should eradicate the plant from the land and keep the land free of the plant. A person should not deal with the plant, where dealings include but are not limited to buying, selling, growing, moving, carrying or releasing the plant.*
Willows *Salix* species	**Prohibition on certain dealings** *Must not be imported into the state, sold, bartered, exchanged or offered for sale.* **All species in the *Salix* genus have this requirement, except *Salix babylonica* (weeping willows), *Salix x calodendron* (pussy willow) and *Salix x reichardtii* (sterile pussy willow)**
Witchweeds *Striga* species	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries* **All species in the *Striga* genus are Prohibited Matter in NSW, except the native *Striga parviflora***
Yellow bells *Tecoma stans*	**Regional Recommended Measure** *Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/or social value.*
Yellow burrhead *Limnocharis flava*	**Prohibited Matter** *A person who deals with prohibited matter or a carrier of prohibited matter is guilty of an offence. A person who becomes aware of or suspects the presence of prohibited matter must immediately notify the Department of Primary Industries*

Appendix F Rapid condition assessment – report template

The Rapid Condition Assessment (RCA) is derived from the 'Save the Bush Toolkit' technique (Wakefield and Goldney, 1997), which identifies the presence or absence of key habitat components and threatening processes. This technique is not applicable to all types of native vegetation (e.g. native grasslands, wetlands or pastures) but is a quick and reliable way to assess the condition of woodland communities.

The RCA requires answering true or false to a series of questions, with a tally of the "True" scores indicating woodland health. Where answers are false, improved management in these areas may be required. Sites scoring 16 - 20 "trues" are generally considered to be areas of healthy vegetation that are sustainable under current management. Sites scoring 10 - 15 "trues" are generally considered to be areas of moderately disturbed bushland that have key elements missing and need improved management. Scores lower than 10 are highly disturbed, have many key elements missing, and are generally unsustainable under the current management regime. These RCA attributes are listed with an example score for relatively undisturbed woodland.

Table 20 Rapid Condition Assessment attributes

Remnant attribute	Site
Low grazing intensity - never farmed	True
Tree and shrub regeneration present (<2m)	True
Infrequent fire regime (<5year intervals)	True
Healthy mature trees (no dieback)	False
Little to no evidence of rabbits	True
Little to no evidence of foxes/cats	True
Low abundance of weeds (most remnants contain some weeds)	True
No evidence of firewood collection	False
No obvious signs of erosion or salinity	True
Not susceptible to fertiliser application, herbicide or pesticide drift	True
Less than 20% trees with Mistletoe (NB some mistletoe is healthy)	True
Few tracks, trails or fence lines	True
Presence of native shrubs	True
Presence of large, old growth trees with hollows	True
Dead timber is left standing	True
Fallen timber and logs are left on the ground	True
Abundance of native ground flora	True
Presence of litter, cryptogams, cracks and rocks	True
Remnant is large (> 5ha is optimum)	True
Connected to or in close proximity to other remnant vegetation	True
Total No. True answers	**18/20**
Health Rating	
% cover of canopy species	Cm 1%, Ec 1%, Et 1%
Stem class maximum (cm)	>80 cm
Stem class minimum (cm)	<5 cm
Stem class average (cm)	20-30 cm

Note: Af=*Angophora floribunda*, Ec=*Eucalyptus crebra*, Cm=*Corymbia maculata*, Et=*Eucalyptus teretecornis*