Objective

Describe the systematic process for identifying, assessing, managing and monitoring natural property values such as biodiversity, water, soil, social and Indigenous/Historic heritage.

Scope

This procedure is applicable to the entire Australian Bluegum Plantations (ABP) estate.

Related Documents

INTERNAL DOCUMENTS
Plantation Management Plan (OP-7069)
Natural Values Management Registers – WA and GT
ABP Koala Management Plan
Natural Values of the GT estate – Green Triangle Region
"Special Values" South West of Western Australia Plantation Estate
Environmental Management Priorities for the Australian Bluegum Plantation Estate – Future Ecosystems
Assessment for High Conservation and Significant Values
Potential Habit Risk Assessment (PHRA)
Regional Master Lists for Rare, Threatened and Endangered (RTE) Species
Environmental and Social Risk Assessment for Operations and Chemical Pesticides (OP-2708)
EXTERNAL DOCUMENTS
Refer to Appendix 2

Definitions and terms

TERM	DEFINITION
Adjacent	next to, or having a common side
Aerial Photography	Google Earth etc.
Best available information	Data, facts, documents, expert opinions, contact information and results of field surveys, review of publicly available records or consultations with stakeholders that are most credible, accurate, complete, and/or pertinent and that can be obtained through reasonable effort and costs, subject to the scale and intensity of the management activities and the Precautionary Approach (Source: FSC® National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN). License code FSC-C019740.
Connectivity	A measure of how connected or spatially continuous a corridor, network, or matrix is. The fewer gaps, the higher the connectivity (Approach (Source: FSC National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN).
Conservation	Management activities designed to maintain the identified environmental or cultural values in existence long-term (Source: FSC National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN).

Cultural significance	*Aesthetic, historic, scientific, social or spiritual value for past, present or future generations. Cultural significance is embedded in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects. Place may have a range of values for different individuals or groups* (Australia ICOMOS Burra Charter, 2013)
Ecosystem	A dynamic complex of plant, animal and micro-organism communities and their non-living environment interacting as a functional unit (Source: FSC National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN
Endangered EVC (Victoria only)	EVC where less than 10% of former range OR less than 10% pre-European extent remains (or a combination of depletion, loss of quality, current threats and rarity that gives a comparable status e.g. 10 to 30% pre -European extent remains and severely degraded).
Environmental value	• Ecosystem functions (carbon storage and sequestration) • Biological diversity (rare and threatened species, vegetation communities, habitat features, fauna and flora) • Water resources (water quantity and quality) • Soils (stability) • Atmosphere (air quality) • Landscape values (visual and amenity) (Source: FSC National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN)
EVC (Victoria only)	Ecological Vegetation Classes (EVC) is a level of classification. An EVC consists of one or a number of floristic communities that appear to be associated with a recognisable environmental niche. Each EVC is described by a combination of its structure, floristic, life-form and reproductive strategy features, and through an inferred fidelity to particular environmental attributes.
Expert	Someone who has qualifications and/or experience in the subject for which they are being consulted.
Field assessment	Any field visit to the site associated with planning for biodiversity. This is often undertaken in conjunction with survey for other aspects of management. Field assessments should involve the use of standardised techniques and reporting that are relevant to the values being assessed. The intensity of survey effort, expertise of assessors, and survey techniques will vary depending on the result of desktop assessments, the intensity of operations, and other factors. Field assessments may result in the need for more detailed targeted surveys and habitat evaluations. (Source: FSC National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN)
Habitat	The place or type or site where an organism or population occurs (Source: FSC National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN).
High Conservation Value (HCV)	**HCV 1 –Species diversity.** Concentrations of *biological diversity* including endemic species, and *rare*, *threatened* or endangered species, that are *significant* at global, regional or national levels.

	HCV 2 –Landscape-level *ecosystems* and mosaics. Intact forest *landscapes* and large *landscape* -level *ecosystems* and *ecosystem* mosaics that are *significant* at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance. **HCV 3 –*Ecosystems* and *habitats*.** *Rare*, *threatened*, or endangered *ecosystems*, *habitats* or *refugia*. **HCV 4 –*Critical ecosystem services*.** Basic *ecosystem services* in *critical* situations, including *protection* of water catchments and control of erosion of vulnerable soils and slopes. **HCV 5 –Community needs.** Sites and resources fundamental for satisfying the basic necessities of *local communities* or *Indigenous Peoples** (for livelihoods, health, nutrition, water, etc.), identified through *engagement* with these communities or *Indigenous Peoples*. **HCV 6 –Cultural values.** Sites, resources, *habitats* and *landscapes* of global or national cultural, archaeological or historical significance, and/or of *critical* cultural, ecological, economic or religious/sacred importance for the traditional cultures of *local communities* or *Indigenous Peoples*, identified through *engagement* with these *local communities* or *Indigenous Peoples*. (Source: FSC National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN)
Historic heritage	Relate to the occupation and use of Australia since the arrival of European and other migrants, including pre-1788 Asian and European exploration, contact and settlement sites. Examples include rare remnants of early convict history, contact sites, pastoral properties, small remote settlements and large urban areas, engineering works, factories and defence facilities, shipwreck and archaeological sites (Australia Government, 2016)
Interim Biogeographic Regionalisation for Australia (IBRA)	A biogeographic regionalisation of Australia developed by the Australian Government (Source: FSC National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN).
Indigenous heritage	Aboriginal and Torres Strait Islander heritage which extends back across many tens of thousands of years and is of continuing significance, creating and maintaining links between the people and the land. Examples include occupation sites, rock art, carved trees, places with known spiritual values, important water or landscapes laded with meaning to people from that Country, and places with contemporary value to Indigenous people (Australian Government, 2016).
Intact Forest Landscapes	seamless mosaic of forest and naturally treeless ecosystems within the zone of current forest extent, which exhibit no remotely detected signs of human activity or habitat fragmentation and is large enough to maintain all native biological diversity, including viable populations of wide-ranging species (Source: Intact Forest Landscapes, 2006-2017)
MU	Management Unit
Old Growth Forest	Ecologically mature forest where the effects of disturbances are now negligible ((Source: FSC National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN).
Precautionary approach	An approach requiring that when the available information indicates that management activities pose a threat of severe or irreversible damage

	to the environment or a threat to human welfare, The Organisation will take explicit and effective measures to prevent the damage and avoid the risks to welfare, even when the scientific information is incomplete or inconclusive, and when the vulnerability and sensitivity of environmental values are uncertain. (Source: Based on Principle 15 of Rio Declaration on Environment and Development, 1992, and Wingspread Statement on the Precautionary Principle of the Wingspread Conference, 23–25 January 1998).
Protection	See Conservation definition
Record	Confirmed sighting
Representative Sample Areas (RSAs)	Portions of the management unit delineated for the purpose of conserving or restoring viable examples of an ecosystem that would naturally occur in that geographical region. (Source: FSC National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN).
Refugia	An isolated area where extensive changes, typically due to changing climate or disturbances such as those caused by humans, have not occurred and where plants and animals typical of a region may survive. (Source: FSC National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN).
Significant values	Values that do not warrant HCV status, but do require some form of note or management.

Identify and Assess Natural Values*

Identify

5-year assessment

Every 5 years, an assessment of ABP's estate is undertaken by an environmental consultant. This assessment provides the following for each region.

- A regional overview (situation analysis diagram) of key conservation values and assets. Please see Appendix 1;
- Current status/condition and threats of these values;
- Opportunities/ challenges and key management strategies; and
- Identification and mapping of High Conservation Values (HCV) (excluding HCV5 and 6) and important waterways and wetlands.

Other assessments

Outside of the external assessment, internal assessments are completed at acquisition and/or pre-harvest using the Assessment for High Conservation and Significant Values template.

*Indigenous heritage**

At acquisition and/or prior to harvesting of ABP sites, relevant Indigenous heritage sources are consulted as part of the Assessment for High Conservation and Significant Values for each property. Appendix 2 provides more information on these sources. Further consultation with local Indigenous groups may be required if a site is identified during this process. Land acquisition is conditional upon the results of the cultural heritage check. Cultural heritage sites are recorded in the relevant Natural Values Management Register.

In the event of a previously unknown site being discovered during operations, the following will occur. ABP employees and contractors are told about this process during their induction.

1. All works will cease immediately
2. The area will be secured to prevent consequential damage
3. The ABP Supervisor/Representative will be notified
4. The ABP Supervisor/Representative will consult with relevant Indigenous groups or authorities about the long-term protection of the site
5. Work will recommence only after approval by ABP has been given

Where applicable, The Aboriginal Heritage Due Diligence Guidelines and the Burra Charter: The Australia ICOMOS Charter of Places of Cultural Significance 1999 will be used to guide the above.

*Historic heritage**

Prior to property acquisition and/or harvesting of ABP sites the Environmental Manager/ABP employees will identify any known historic heritage areas as part of the Assessment for High Conservation and Significant Values. See examples of sources used in Appendix 2.

*Environmental values**

Prior to acquisition and/or harvesting of ABP sites the Environmental Manager and/or ABP employees will identify any known environmental values as part of the Assessment for High Conservation and Significant Values using information from existing Natural Values Management Registers; considering sources listed in Appendix 2 and through consultation with ABP operations.

Records of searches will be saved to relevant property folders.

Regional catchment goals

In consultation with relevant stakeholders listed in Appendix 2, any authorised regional catchment goals will be identified where available and recorded into the relevant Natural Values Management Register.

EVCs

For Victorian plantations, the endangered EVC layer from the Biodiversity Mapping Tool is overlayed with the plantation. Endangered EVCs intersecting with plantations are displayed on the Environment and Hazard Maps. These areas are to be treated as strict exclusion zones from forest operations. There are certain EVCs that meet the criteria of HCVF and will be displayed as HCVF on the plantation maps. These are EVC 55_61, 55_63, 651, 649, and 897.

Endangered, critically endangered, rare and threatened species

Best available information* is used to identify specific locations of habitat for endangered, critically endangered, rare and threatened species. Identifying specific locations of habitat for endangered and critically endangered species may also use expert opinion and/or field surveys.
Following acquisition of property and during pre-harvest assessments a list of endangered, critically endangered, rare or threatened species known or likely to occur within or adjacent to the property is made from the following:

- Federal Government's Protected Matters Report: and either
- Victoria's Department of Environment, Land, and Water Protection (DELWP) Nature Kit;
- Western Australia's Department of Biodiversity, Conservation and Attractions (DBCA) NatureMap; or
- South Australia's Department for Environment and Water (DEW) NatureMap.

Each of these species is then assessed using the Potential Habitat Risk Assessment (PHRA). The process for this is shown in Diagram 1 in Appendix 3.

*Best Available Information includes where applicable:

1) Mapping or other assessment, including surveys and consultation of database records, of rare and threatened species and their habitat known or likely to occur in the Management Unit that may be negatively affected by management activities, including an assessment of known and likely locations and habitat* locations.

2) A review of the assessment of rare and threatened species undertaken by a locally knowledgeable expert independent of The Organisation.

3) Pre-harvest surveys and/or habitat assessments.

4) An assessment of the adequacy and currency of Best Available Information in identifying species, impacts and management response, and further information that may need to be acquired.

5) Consultation with relevant expert or knowledgeable stakeholders.

Source: FSC National Forest Stewardship Standard of Australia (FSC-STD-AUS-01-2018 EN)

The PHRA uses conservation status and habitat/distribution information for each species to determine the risk of specified locations of habitat being present within or adjacent to ABP's managed area. Risk ranges from low to very high. Conservation status, habitat and distribution information can be found in the regional master Rare, Threatened and Endangered (RTE) lists. When assessing for habitat, past land use for example clearing, grazing, farming etc. and local or expert knowledge are considered. The PHRA also helps to determine the likelihood of impact of ABP's operations on any identified habitat.

Assess, consult and document

The Environmental Manager and/or other ABP Representative will assess each of the identified values for significance using the criteria listed in Appendix 4 as a guide. The assessment of each value needs to consider the following.

1. Consult the Best Available Information (BAI)* to identify relevant datasets and prepare lists and maps of potential HCV accordingly. See Appendix 2 for examples of BAI.
2. Consult experts and other knowledgeable stakeholders to identify HCVs.
3. Undertake a threat assessment* of management activities on identified HCVs.
4. Identify management required to maintain and/or enhance identified HCVs.
5. Develop a program of periodic monitoring" and adaptive management* as required.
6. Consult stakeholders on assessment, management and monitoring. Records of consultation will be logged into the Stakeholder Register of the Integrated Management System (IMS).
7. Finalise assessment and implement management and monitoring plan.

Representative Sample Areas (RSA) are selected as part of the HCV assessment process. Each RSA is selected to reflect a particular native ecosystem of the landscape. Once HCV, other values and RSA have been confirmed details of their location, values, threats, management, and monitoring will be recorded in the relevant Natural Values Management Register, and then communicated to ABP employees via email and/or regional meetings. Where appropriate, results are made publicly available through industry forums and community workshops.

Regional Natural Values Booklets are an additional resource to communicate values and educational resources for ABP employees and contractors. Booklets are updated as required. In addition to the booklet's ABP employees and contractors are made aware of values through inductions; environment and hazard maps and harvest plans.

Management of High Conservation, RSA and Other Values

Each identified HCV and RSA including resources and habitat of rare and threatened species will be maintained, protected or enhanced and its management outlined in the relevant Natural Values Management Register. Primarily areas of HCV, RSA and other values are excluded from our key operations. Where available, recovery plans, conservation advices and/or equivalent instruments will be considered when developing management prescriptions for rare and threatened species. To ensure this information is up to date ABP will use the following sources.

WA – Department of Biodiversity, Conservation and Attractions

Approved recovery plans

Plants, animals and ecological communities

https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities

VIC – Department of Environment, Land, Water and Planning (DELWP)

https://www.environment.vic.gov.au/conserving-threatened-species/threatened-species-advisory-lists

SA – Department of Environment, Water and Natural Resources

Plants - https://www.environment.sa.gov.au/managing-natural-resources/Plants_Animals/Threatened_species_ecological_communities/Recovery_planning/Plans_for_threatened_plants_in_SA

Animals - https://www.environment.sa.gov.au/managing-natural-resources/Plants_Animals/Threatened_species_ecological_communities/Recovery_planning/Plans_for_threatened_animals_in_SA

Ecological communities - https://www.environment.sa.gov.au/managing-natural-resources/Plants_Animals/Threatened_species_ecological_communities/Recovery_planning/Plans_for_nationally_threatened_ecological_communities_in_SA

Species Profile and Threats Database (SPRAT)

http://www.environment.gov.au/cgi-bin/sprat/public/publicshowallrps.pl

Threats

The following section provides information on the key threats across the ABP estate.

Dieback

Australian biodiversity assets are threatened by the spread of *Phytophthora spp.*, commonly referred to as dieback. Susceptible plants may die out completely where infection is present. Figure 1 below shows the location of *Phytophthora cinnamomi* records throughout Australia.

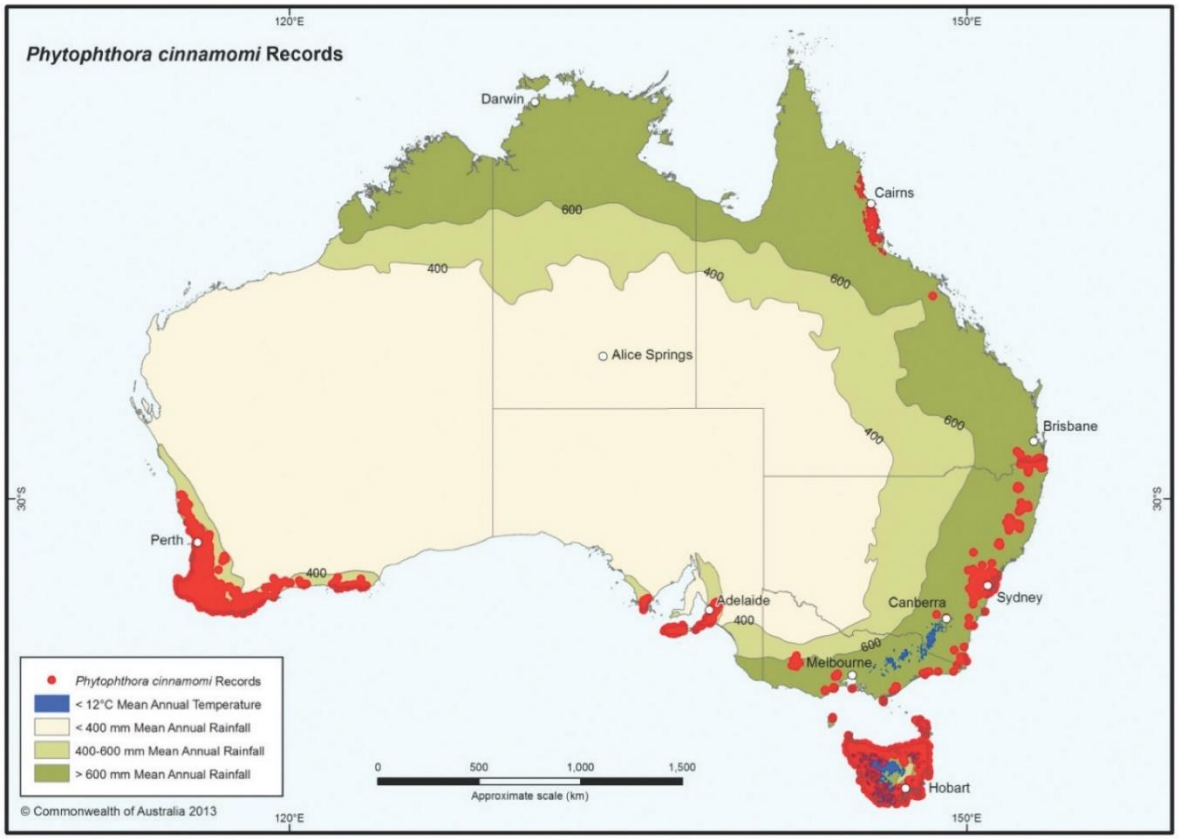

Figure 1. Records of *P. cinnamomi* throughout Australia (Commonwealth of Australia, 2014a)

P. cinnamomi is found throughout areas of Mediterranean climate which receive above 600 mm annual rainfall. Where annual rainfall is between 400 mm and 600 mm, *P. cinnamomi* tends to be confined to stream systems and road verges (especially table drains).

Figure 1 shows dieback is widespread throughout the southwest, great southern regions of Western Australia, extending between Eneabba and Esperance. More than 40% of plant species in this region are susceptible to dieback and once infected are killed. There are also records of dieback from the Grampians in Victoria, however the spread of dieback has not been comprehensively documented in Victoria. Common native plants that are susceptible include Jarrah, Banksia, Grass trees, Zamia palms, Dryandra and Hakea species.

Signs that plant death could be caused by Phytophthora include:

- Lines, groups or localised areas of plant deaths are more likely to be caused by *P. cinnamomi* than odd, scattered individual plant deaths in otherwise healthy vegetation.
- An edge effect. Edge effects are most obvious when there is a clear distinction between healthy and diseased vegetation.
- Old deaths and recently killed plants, that is, an 'age range' in the deaths. This is because Phytophthora moves from plant to plant over time, killing each plant as it goes.
- Plant deaths that are localised within a distinct area of the property often at a low lying water accumulating area. Lines, groups or localised areas of plant deaths are more likely to be caused by Phytophthora than odd scattered individual plant deaths in otherwise healthy vegetation.
- Signs of the disease in a range of susceptible plant species.
- Something that could have introduced the disease, for example a track, road or vehicle activity.

ABP has assessed the risk of operational activities spreading dieback as high in Western Australia and as moderate within the Green Triangle. The 'Framework for Hygiene Management Planning' in Appendix 4, outlines the assessment process that all ABP blocks are assessed against prior to activities commencing.

In general the following standard hygiene strategies are recommended across all high risk areas (SCNRM, 2011).

1. Restrict activities to dry soil conditions whenever possible and/or low rainfall months (Nov-Mar). 'Dry' means at a level where there is no significant pickup of soil/gravel/mud from road/track surfaces. This practice will reduced the time needed for vehicle clean down at hygiene points.
2. Ensure all vehicles/equipment/footwear are free of soil prior to entering and exiting bushland or adjacent areas and clean down between sites.
3. Minimise soil disturbance wherever possible.
4. Develop plan for traffic management to protect uninfected areas.
5. Develop plan for movement between sites within bushland area to flow from non-infested to infested areas.
6. Only un-infested raw material will be used for all earthworks within dieback free or protectable areas and/or in-situ material in uninterpretable areas.
7. ABP employees to attend a dieback information workshop prior to commencement of on-ground works.

The following provide more information on dieback.

Dieback has been identified in the EPBC Act as a threatening process. As outlined in the *Threat abatement plan for disease in natural ecosystems caused by Phytophthora cinnamomi* (Commonwealth of Australia, 2014b), Commonwealth, State, Territory and local Governments have identified priorities listed to better inform the threat of *P. cinnamomi* in Australia. As these priorities are completed, ABP will ensure that the information obtained is incorporated into future revisions of this Natural Values Management Plan as '*The costs of on-ground survey and sample analyses have made the initial mapping or updating of maps expensive and only applicable ahead of major operations requiring disease demarcation* (Commonwealth of Australia, 2014a).'

Western Australia

Phytophthora dieback - Parks and Wildlife Service

Project Dieback

Green Triangle

L:\ABP\HSEC\GT\Environmental Management\Dieback

Where dieback is present in the GT, and there is a threat it could be spread, ABP will operate in accordance with the Victorian Code of Practice for Timber Plantations (2014) and the Guidelines for Plantation Forestry in South Australia (2009) and appropriate hygiene measures will be implemented.

Myrtle Rust

The primary biosecurity threat to ABP is Myrtle Rust. ABP's management response is guided by the 4 categories for emergency plant pests and diseases according to Plant Health Australia (PHA). The Australian plantation industry is signatory to the Emergency Plant Pest Response Deed which is a legally binding agreement between PHA, the Australian Government, all state and territory governments and national plant industry body signatories.

Weeds/Wildlings

A significant threat to HCVs, especially those associated with heathy and herb-rich woodlands is the invasion of habitat altering weeds.

Bulbous Canary Grass (Phalaris aquatic) and other exotic perennial grasses and herbs are typically the greatest threat to grassy woodland systems and other vegetation types on clay soils as well as many threatened plant species.

Declared weeds and Weeds of National Significance (WONS) are controlled as per legislative requirements. Control of regional priority, such as Sydney Golden Wattle and agricultural weeds is undertaken in

consultation with relevant stakeholders and where it is cost effective to do so. Wildings are monitored through property inspections and control programs discussed, prioritised and actioned at regional operational meetings.

Refer to Weed and Pest Control procedure (OP-7018) and Weed and Pest Control Reference Guide for procedures and chemical rates etc.

Feral Animals

Fox, rabbit, pig, cat, deer and dog control programs are undertaken in accordance with schedules outlined in the Natural Values Management Registers and in conjunction with community programs (eg. conservation action plans, catchment group programs) where a population is of concern to neighbours or there is an increase in numbers which threaten natural areas and the fauna they support. Where possible to improve effectiveness, programs are undertaken in conjunction with stakeholder programs.

Fox baiting for HCVs targeting 'critical weight range' mammals is only likely to be effective for native vegetation areas adjoining large public land blocks being targeted through the Glenelg Ark Program in the Green Triangle (or other similar programs). And is more likely to be effective for the Long-nosed Potoroo than the Southern Brown Bandicoot.

Illegal firewood collection

Manage illegal access in order to prevent the loss of native vegetation and important hollow nesting trees (dead and alive) by locking gates, installing cameras and pursuing enforcement, where possible. Instances of illegal firewood collection will be recorded in the IMS. Incidents should be titled using the following format: 'Illegal Firewood Collection (Observation) – Plantation Name'.

Fencing and Stock Exclusion

Livestock is considered a threat to all natural values and will be excluded. There may be exceptions in cases of weed/biomass management where grazing is prescribed through a management plan. However, expert advice should be sought (eg. Catchment Management Authority) prior to treatment.

Climate change

ABP recognises climate change is likely to have a negative impact on threatened and non-threatened native flora and fauna communities. ABP is committed to protecting these communities and in some cases enhance them, to protect their significance.

Disturbance via Plantation Establishment and Harvesting Activities

Forestry operation activities may disturb threatened native species by way of noise pollution and prolonged human/machinery presence. Threats posed by operations should be avoided where these threatened species are utilising plantations and associated remnants during their breeding season, as a means to aid the long-term survival and recovery of these species.

Examples include; Brolga (*Grus rubicunda*), South-eastern Red-tailed Black Cockatoo (*Calyptorhynchus banksia graptogyne*), Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksia naso*), Carnabv's Cockatoo (*Calyptorhynchus latirostris*) and Baudin's Cockatoo (*Calyptorhynchus baudinii*). These are the most likely threatened species to be impacted by forestry operations. Where breeding habitat of the above species is known to occur (wetlands for brolga and large hollow nesting trees/feeding trees for black cockatoos), forest operations are excluded throughout the respective breeding seasons, until it can be confirmed that the breeding resources are not being utilised, at which point operations may proceed with ongoing monitoring in place.

Other Management

Standing and fallen dead wood habitats

Standing and fallen dead wood habitats are generally retained as they provide important habitat for birds, bats and other fauna. Large dead trees with tree hollows are protected by Environmental Significance Overlays in parts of the Green Triangle region (West Wimmera Shire and Glenelg Shire) due to their

importance as nesting habitat for the South-eastern Red-tailed Black Cockatoo, therefore permits are required for tree removal in these areas. If there is a particular circumstance where a standing tree may need to be removed in any jurisdiction, independent advice from the relevant authority will be obtained before removal. Further information can be found at:
http://planning-schemes.delwp.vic.gov.au/schemes/westwimmera/ordinance/42_01s02_wwim.pdf
http://www.redtail.com.au/

Koala Program

Koalas are currently protected in Victoria under the Wildlife Act 1975 and the Prevention of Cruelty to Animals Act 1986. ABP has been issued with an authorisation to disturb koalas under Section 28A (1A) of the Wildlife Act 1975 by the Department of Environment, Land, Water and Planning (DEWLP). ABP is actively involved and represented on the Koala Leadership Committee. Koalas currently reside in some of ABP's estate located within the Green Triangle and may be at risk from harvesting and silviculture activities. To mitigate these risks and meet the requirements of ABP's Koala Management Plan, ABP engages dedicated koala spotting and welfare contractors, who implement the requirements of the Koala Management Plan. These requirements include surveying; controlling risks; incident reporting; and monitoring of koalas during and post operational activities. Relevant ABP employees and contractors working in these areas are trained in accordance with the requirements of this Plan. In pursuit of continuous improvement, ABP regularly undertakes a review of its performance against the Plan and implements strategies to minimise harm to Koalas.

Native Vegetation, Wetlands and Natural Ecosystems

Remnant native vegetation, wetlands and other natural ecosystems are treated as strict exclusion zones when undertaking forest operations. They have the same level of protection as HCV, however the management and monitoring requirements may differ. Controlling high impact weeds, rabbits, fencing, stock exclusion or grazing are the most common management tools as outlined above. Decisions on what management is to be applied depends on location, extent, degree of threat, budget/cost, inclusion in other programs, and community involvement. HCV has priority over other values.

In the GT region native grasslands are highly threatened. Prior to new plantations (greenfield ie. conversion of pasture to forestry) being established, existing grassland mapping will be consulted. A more detailed on ground assessment may be required where grasslands are likely to occur on new plantations.

Seasonal herbaceous wetlands are another important value for the GT region requiring careful consideration when new plantations are established or rotated, as the footprint of these wetlands' changes dramatically in wet conditions. Where wetlands are likely to occur, existing wetland mapping will be consulted, and more detailed assessment performed to map the full extent of wetlands and provide appropriate setbacks. In many cases wetland hydrology has been modified by historical drainage and can be restored by installing weirs. The above actions should be considered for high value wetlands where interventions are likely to be cost effective.

http://www.environment.gov.au/cgi-bin/sprat/public/publicshowcommunity.pl?id=97

Riparian zone vegetation buffers of wetlands and other waterways are carefully maintained and considered for enhancement or restoration projects.

Cultural heritage (includes Indigenous and historic heritage)

Primarily areas of cultural significance are fenced where appropriate and managed in accordance with Natural Values Management Register.

Soil and water protection

Soil and water protection are vital to ensure the ongoing sustainability of the land resource. ABP will take reasonable steps to mitigate any real or potential offsite environmental and or social impacts.

Soil

Operational procedures and controls ensure measures are in place to evaluate the potential impacts on the soil prior to commencing operations and to take any necessary actions to manage these risks. During

operations and once they have been completed, monitoring takes place to evaluate the effectiveness of the controls and revise them if necessary.

1. Soil erosion
   Under normal circumstances, forestry operations on ABP's blue gum plantations do not produce a significant risk of erosion. Soil erosion can be caused by forestry operations. ABP actively manages soil erosion through the implementation of the following procedures.
   - Land Preparation (OP-7009)
   - Plantation Access and Roading Specifications (OP-7439)
   - Harvest Operation (OP-7403)
   - Harvest Planning (OP-7400)

2. Nutrient Retention
   ABP monitors the nutrient status of the plantations through foliar sampling and/or soil analysis and can apply fertiliser to sites that are deficient in nutrients. Forestry practices are conducted to take nutrient status into consideration. The following procedures outline how residues are managed and soil nutrients are maintained.
   - Harvest Operation (OP-7403)
   - Nutrition Procedure (OP-7021)
   - Research (external and Internal)
   - Harvest Planning (OP-7400)

3. Compaction
   Soil compaction may occur on our operations due to excessive skidding or machinery traversing the same terrain frequently. Methods to minimise compaction include using broadcast slash and minimising movement over the same tracks. The following procedures outline how residues are managed.
   - Land Preparation (OP-7009)
   - Harvest Operation (OP-7403)
   - Harvest Planning (OP-7400)

4. Pollution
   Soil pollution may occur during operations through accidental discharge (spill) of fuels, oils, pesticides and fertiliser. ABP has developed the following procedures to substantially reduce the risk of accidental discharge and to clean up and properly dispose of contaminated soil if accidental discharge of pollutants occurs.
   - Employee and contractor inductions (Rapid Induct)
   - Spill response Plan (OP-2001)
   - Weed and Pest Control (OP-7018)
   - Nutrition Procedure (OP-7021)
   - Harvest Planning (OP-7400)

Water

Forestry activities have the potential to interact both positively and negatively with aquatic resources. ABP's planning and management of plantations will look to mitigate and/or eliminate potential negative impacts while considering the positive aspects of forestry, such as aquatic biodiversity enhancement. Water pollution may be caused by soil erosion or the uncontrolled discharge of chemicals. To minimise/prevent chemical runoff, ABP establishes and maintains buffer zones in accordance with relevant Codes of Practice, which aim to improve the condition of native riparian vegetation.

1. Water pollution is caused in part by soil particles entering the water because of soil erosion. Correct planning, especially on certain sites where there is a greater risk of erosion and subsequent water pollution is essential. Correct use of setbacks and buffers is also essential to protect water quality. ABP has the following procedures to substantially reduce the risk of water pollution from soil particles entering the water.
    - Land Preparation (OP-7009)
    - Plantation Access and Roading Specifications (OP-7439)
    - Harvest Operation (OP-7403)
    - Harvest Planning (OP-7400)

2. Water pollution from hydrocarbons, pesticides and fertilisers. Accidental spillage or leakage is detrimental to aquatic flora and fauna and can impair water quality. Training and safety are of primary importance to ensure correct use of pesticides and fertilisers. ABP has the following procedures to substantially reduce the risk of water pollution from chemicals entering the water.
    - Employee and contractor inductions (Rapid Induct)
    - Spill response Plan (OP-2001)
    - Weed and Pest Control (OP-7018)
    - Nutrition Procedure (OP-7021)

Remediation

If soil, water or remnant vegetation is harmed, it will be documented as an incident on ABP's Integrated Management System (IMS). The incident will then be investigated which will include the identification of contributing factors and corrective actions. Should remediation be required, the following options may be used depending on type and severity of the impact.

- Ensure access has been made safe.
- Consult expert/relevant stakeholder(s) where required.
- Modification/redirection/management of run off through slash retention, chopper rolling, drainage works, and spray exclusion zones.
- Leave the vegetation to naturally regenerate or undertake revegetation which can include replanting of native species and weed control.
- Increase buffers where historic forestry or farming activities have insufficient buffers and setbacks.

When remediation is not possible ABP will work through a process to ensure a fair outcome. The mechanisms for resolving grievances and providing fair process to local communities can be found in the Stakeholder Engagement and Dispute Resolution Policy and Procedure.

Prescribed burning

Natural areas for ecological burning programs will be identified during plantation monitoring, annual HCV assessments and in consultation with ABP employees and relevant environmental stakeholders. A burn plan and report will be completed by the Silvicultural department. ABP in consultation with local landowners and authorities such as Department of Biodiversity, Conservation and Attractions; Department of Environment, Water, Land and Planning; Department of Fire and Emergency Services (DFES), Country Fire Authority (CFA) and Country Fire Services (CFS) will give consideration to any state legislative requirements, the objectives of the burn, plant and animal species known or presumed to be present, and the potential fire hazard of the native vegetation and adjacent land use.

At least 48 hours before a burn, neighbours and local brigades (if in restricted fire period) will be notified by the relevant Silvicultural Forester. Permits will be obtained where required. On the morning of the impending burn, a spot weather forecast with 4-day outlook will be obtained from the Bureau of Meteorology ensuring the optimum weather requirements outlined in the burn plan will be met ie. Suitable wind speed/direction, temperature and relative humidity. Once it is clear weather conditions are favourable, confirmation should then be given to the local Fire Control Officer that the burn will proceed. This should be done on the morning of the fire, prior to any lighting.

Once it has been confirmed the burn will go ahead roadside signs will be erected where required. All personnel participating in the burn will have the appropriate training and personal protection equipment (PPE). All ABP employees and contractors involved in the burn will be made aware of the burn plan, lighting pattern and be in constant communication with the burn supervisor.

Other burns

There are various ways fires can start and enter land under ABP's management. For example, lightning strikes, neighbours undertaking burning operations that have escaped or machine fires.

Post burn, areas of remnant vegetation will be monitored to assist with management of these areas.

Completed burn plans and reports are saved electronically and in hard copy.

Regional catchment goals and hydrological flows

Forest operations will be managed to ensure hydrological flows are in accordance with any authorised regional goals, where available. Where these goals are not available, the adverse environmental impacts of changes in hydrological flows will be minimised by ensuring that:

- The long term and short-term disturbances to hydrological flows relative to the existing situation are considered;
- The environment impacts of both increased and reduced hydrological flows are considered.

Any goals and management thereof will be documented in the relevant state Natural Values Management Register.

Rehabilitation, enhancement and restoration

Where possible, ABP engages in surveying, rehabilitation, enhancement and restoration of areas with HCV, RSA or other values. When selecting areas for such work the following will be considered in consultation with relevant stakeholders:

- Benefit to biodiversity protection;
- Benefit to community;
- Cost and availability of funding;
- Cost effectiveness;
- Condition ratings;
- Ecosystem representativeness and significance;
- Ownership of the land;
- Size and connectivity;
- The potential to create wildlife corridors.

Any regeneration activities must be undertaken in accordance with relevant Standard requirements and detailed records including suitable selection of trees species and weed management maintained.

Wildlife corridors

Wildlife corridors will be managed with consideration of rare and threatened species present within the ecological landscape. This will be done in consultation with relevant stakeholders; management documents (such as Recovery Action Plans and Conservation Advices); and spatial data. Management of biodiversity and environmental works will consider wildlife corridors and habitat connectivity on a landscape scale in order to plan effectively and implement projects that are of benefit.

Monitoring

HCV

Periodic monitoring is carried out to assess changes in the status and condition of HCV. Initial monitoring regimes are established based on expert assessments such as the one conducted by Future Ecosystems as referenced in this plan. These regimes are recorded in the Natural Values Management Registers. Interested stakeholders have the opportunity to provide input into ABP's monitoring program through

directly speaking with an ABP employee; referring to the contact section on the ABP website or during consultation periods where the Natural Values Management Plan is circulated for comment.

Assessments of HCVs and RSAs are performed on an annual basis. A reduction in assessment frequency to biennially (every other year) can be considered if the following criteria are met:

- HCV has no new or emerging threats such as increasing weeds/pest species or disease etc.
- There are no new or immediate threats to vegetation structure or biodiversity.
- No management activities have been performed that require ongoing monitoring ie. weed/pest control, revegetation etc.

Assessments are undertaken by ABP employees and/or consultants using the HCV Assessment form. The HCV Assessment Form records the following:

- Connectivity on a local, regional and landscape scale
- Vegetation structure, cover and condition adapted from Keighery (1994) and Trudgen (1988) in Western Australia and Keighery (1994) in the Green Triangle
- Presence/estimated density of hollow bearing trees
- Fire age
- Evidence of threatened species and positive/negative indicator species
- Presence/condition of cultural heritage and any relevant threats
- Presence/abundance/disturbance of weed and pest species
- Presence and extent of disease
- Evidence of physical threats such as firewood theft, erosion, grazing, fire etc.
- Permanent photo record points
- Management Activities (weed/pest control, prescribed burn, revegetation etc.)
    - Recommended/required management actions
    - Prescribed management and whether it has been conducted.
    - Whether the management conducted has achieved its objective and the outcome was a consequence of management

If current management practices are found to be ineffective or there has been a significant change, a review is conducted, and management is altered/improved where required in consultation with employees and relevant stakeholders.

Other values

Other values are monitored during the year as part of routine plantation inspections.

Offsite impacts

Offsite impacts such as fire, weeds, soil erosion, spray drift and wildings are monitored during the year through routine plantation inspections, operations and as part of HCV monitoring.

External monitoring programs

Where available ABP will review results from external monitoring programs and consider these when developing management and monitoring regimes. Some examples include:

- Red Tailed Black Cockatoo Recovery Project
- Carnaby's Black Cockatoo Recovery Project
- Conservation Action Planning (CAP) programs
- Catchment group community coordinated programs eg. Fox-off, weed control

Training

Contractors and employees will be made aware of any values at inductions using the regional Natural Values Booklets and environment and hazard maps. After this time meetings, newsletters, maps, plans and bulletins will be used to communicate any additional values or changes.

ABP employees will also undergo cultural heritage awareness training every five years.

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Appendix 1 – Conservation assets and values

Conservation assets and values
The below tables describe the different conservation assets (broad ecosystem or habitat types) of the Green Triangle (see table 1a) and the Western Australian (see table 1b) regions and lists important values or "nested assets" associated with each asset, including threatened species and threatened ecological communities.

Table 1a. Conservation assets and values for the Green triangle estate (Source: Environmental Management Priorities for the Australian Bluegum Plantation Estate).

Value/Ecosystem	Description	Nested species (Associated Threatened/Declining Species and Assemblages)
Threatened ground-dwelling fauna (heathy and herb-rich woodland habitat)	Typically dominated by *Eucalyptus baxteri* or *E. arenacea* in association with a diverse heathy understorey layer. Relatively well-represented vegetation communities associated with nutrient-poor Quaternary or Tertiary-derived low dune systems. Key refuge habitat for critical weight range mammals (mammals weighing between 35-5500g).	**GROUND-DWELLING FAUNA:** Southern brown bandicoot, Long nosed potoroo, Common dunnart, Swamp antechinus Heath mouse, Smoky mouse, Silky mouse, Eastern pygmy-possum, Striped worm-lizard, swamp skink **WOODLAND BIRDS:** SE Red-tailed black cockatoo, Scarlet robin, Flame robin **THREATENED ORCHIDS:** Eg. Limestone spider-orchid, swamp diuris, Metallic sun-orchid, Merran's sun-orchid, Mellblom's spider-orchid
Plains Open Woodlands and Grasslands	WOODLAND BIRDS	**Woodland Birds:** Diamond firetail, Spotted quail-thrush, Brown treecreeper, (SE subspecies), Barking owl, Hooded robin, Crested shrike-tit, Western Gerygone, Speckled warbler, Jacky winter, Black-eared cuckoo, Crested bell-bird, Restless flycatcher, Plains wanderer, Bush Stone Curlew, Painted button-quail, Brown quail **ARBOREAL MAMMALS:** Yellow-bellied glider, Sugar glider, Feather-tail glider, Western pygmy possum **THREATENED FLORA:** Large white spider-orchid, Elegant spider-orchid, Fringed sun-orchid, Inflated sun-orchid, Globe-hood sun-orchid, Hairy tails, Wavy swamp Wallaby-grass **THREATENED PLANT COMMUNITIES:** Grassy ecosystems are highly underrepresented in remaining native vegetation. Natural Temperate Grassland of the Victorian Volcanic Plain is EPBC listed as Critically Endangered.

SE Red-tailed Black Cockatoo Nesting Trees (large, old trees)	Includes large old trees with hollows. Important areas include the Corndale and Powers Creek and other areas within 2km of remnant vegetation.	Other hollow dependent fauna including birds and bats.
Waterways and Riparian areas	Includes rivers and creeks associated with a diverse range of vegetation communities.	**WOODLANDBIRDS:** Regent parrot, Barking owl, Brown treecreeper. **AQUATIC FAUNA:** Glenelg spiny cray, Ewan's pygmy-perch, Yarra pygmy-perch, Variegated pygmy-perch, Dwarf galaxias, Platypus, Glenelg mussel, Endemic snail species, Growling grass frog, Latham's Snipe, Nankeen night-heron **THREATENED FLORA:** *Eremophila bignonia, Lepidium monoplocoides* **THREATENED PLANT COMMUNITIES:** Floodplain Riparian Woodlands, Riverine Grassy Woodland, Escarpment Shrubland
Freshwater Wetlands	Includes seasonally inundated wetland communities (shallow ephemeral wetlands) and semi-permanent freshwater wetlands.	**AQUATIC BIRDS:** Brolga, Australasian bittern, Royal spoonbill, Fairy Tern, Whiskered tern, Intermediate egret, Great egret, Buff-banded rail, Spotless crake, Australian spotted crake, Blue-billed duck, Musk duck, Hardhead, Australasian shoveller, Pied cormorant (and others). **AMPHIBIANS:** Growling grass frog, Brown toadlet. **THREATENED FLORA:** Wetland blown grass, Ivy-leaf duckweed, Wavy swamp wallaby-grass. **THREATENED COMMUNITIES:** Seasonal Herbaceous Wetlands (freshwater) of the Temperate Lowland Plains is EPBC -listed as Critically Endangered.

Table 1b. Conservation assets and values for the Western Australian estate (Source: Environmental Management Priorities for the Australian Bluegum Plantation Estate).

Asset/Ecosystem	Description	Nested Assets (Associated Threatened/Declining Species and Assemblages)
Jarrah-Marri Forests and Woodlands	Jarrah/Marri varies from Forest to Low Woodland occurring on a range of soil types including granites, laterites and deep sands. The dominant overstorey species are Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia*	**THREATENED BLACK COCKATOOS**: Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo, Baudin's Cockatoo. All three taxa are thought to be declining, with Baudin's Cockatoo in serious decline. **WESTERN RINGTAIL POSSUM (CR):**

	calophylla), which are important food sources for a number of threatened Black Cockatoos. Large old trees produce hollows which are known to be a limiting resource for cockatoos. Understorey species include banksias and other proteaceous plants, sheoaks, grass trees, melaleucas & tea trees and a range of acacias and members of the pea family.	occur mainly within woodlands within 20km of Albany coastline **THREATENED FLORA:** *Banksia brownii* (CR), *Banksia goodie* (VU). All trees provide feeding habitat. Large, old trees provide critical nesting habitat for threatened cockatoos.
Karri forests	Karri (*E. diversifolia*) forests are tall forests occuring in cooler, wetter areas on loamy soils, often in association with underlying limestone. They are associated with a diverse shrubby understorey including ferns, orchids, fungi and other mesic species.	**THREATENED BIRDS:** Muir's Corella (*Cacatua pastinator pastinator*) **THREATENED FLORA:** *Caladenia harringtoniae*, *Kennedia glabrata*, *Reedia spathacea* **GROUND-DWELLING FAUNA:** Quenda, Chuditch, Tammar Wallaby
Mallee Heath communities	Low open woodlands or scrubs with a diverse (often rich in proteaceous shrubs), variously dominated by *E. tetrogona, E redunca* or *E. marginata*. Healthy heathlands and particularly proteaceous rich communities provide copious amounts of nectar and pollen, an important food source for native birds, mammals and insect species throughout the year, particularly during autumn and winter when other food sources are limited. They are very susceptible to the plant pathogen Phytophthora cinnamomi (dieback) and to other disturbances such as fire, weeds and fertiliser drift.	**NECTAR-DEPENDENT FAUNA:** Western Pygmy Possum, Honey Possum, birds and bats **THREATENED BLACK COCKATOOS** (important feeding habitat): Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo, Baudin's Cockatoo **THREATENED FLORA:** *Eucalyptus goniantha* subsp. *goniantha* **GROUND-DWELLING FAUNA:** Black-gloved (or western brush) Wallaby (*Macropus irma*)
Coastal vegetation	Low closed woodlands or scrubs, variously dominated by *E. staeri*, Acacia shrublands or mixed heathlands. Proteaceous-rich communities provide copious amounts of nectar and pollen, an important food source for native birds, mammals and insect species throughout the year	**THREATENED ECOLOGICAL= COMMUNITIES:** *Banksia coccinea* Shrubland/*Eucalyptus staeri*/ Sheoak Open Woodland (Community 14a) **NECTAR-DEPENDENT MAMMALS:** Western Ringtail Possum (Critically Endangered), Western Pygmy Possum, Honey Possum. **THREATENED FLORA:** *Lysinema lasianthum*, *Pleurophascum occidentale*

Waterways, Riparian areas and associated wetlands	A number of important waterways occur in the region and are associated with ABP plantations, including: Hay River, Sleeman Creek, Kalgan River, King River and Marbelup Brook. Waterways and riparian areas tend to occur in more productive parts of the landscape and provide important habitat for terrestrial animals such as birds and mammals as well as aquatic life.	Wandoo vegetation communities (restricted to Kalgan River floodplain areas in this region) **HOLLOW-DEPENDENT FAUNA:** Carnaby's Cockatoo (nesting habitat), Brush-tailed Phascogale (Near Threatened, WA), Red-tailed Phascogale (EPBC Endangered) **GROUND-DWELLING FAUNA:** Quenda, Chuditch
Ground dwelling fauna	Tammar Wallaby, Black-gloved Wallaby, Quenda, Chuditch. Susceptible to a range of threats including habitat loss and degradation (esp. loss of understorey cover), habitat fragmentation and predation by foxes and cats. A large-scale fox baiting program in the region has assisted the recovery of these species.	

Appendix 2 - Values and tools used for identification

Environmental values – HCV Subcategories		
Value to be Identified	**Source of Information**	**Features**
HCV 1 Species diversity. Concentrations of biological diversity including endemic species, and rare, threatened or endangered species, that are significant at global, regional or national levels.		
1.1 Areas that contain significant concentrations of rare and threatened species or that contain habitat critical to the survival and long term viability of these species	Protected matters interactive search tool http://environment.gov.au/epbc/pmst/index.html	A reporting tool that provides regional information including: • World heritage properties • Australian Heritage sites • RAMSAR sites • National protected areas • Commonwealth heritage • Nationally Important Wetlands • Reserves and Conservation Areas • Threatened species • Threatened ecological communities
	NatureKit (Victoria) http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit Nature Maps (South Australia) http://spatialwebapps.environment.sa.gov.au/naturemaps/?locale=en-us&viewer=naturemaps NatureMap (Western Australia) https://naturemap.dpaw.wa.gov.au/default.aspx	• Native vegetation overlays • Threatened species • Information on parks, reserves and other protected areas • IBRAs
	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) https://www.speciesplus.net/#/	A list of endangered species under threat from international trade.
1.2 Areas that contain centres of endemism	NatureKit (Victoria) http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit Nature Maps (South Australia) http://spatialwebapps.environment.sa.gov.au/naturemaps/?locale=en-us&viewer=naturemaps	• Native vegetation overlays • Threatened species • Information on parks, reserves and other protected areas • IBRAs

	NatureMap (Western Australia) https://naturemap.dpaw.wa.gov.au/default.aspx	
	Atlas of Living Australia https://www.ala.org.au/	Species records and distribution data
	Species Profiles and Threats Database (SPRAT) http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl	Recovery/action plans of threatened species
1.3 Areas that contain significant concentrations of rare species that are poorly reserved at the IBRA region scale	NatureKit (Victoria) http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit NatureMap (South Australia) http://spatialwebapps.environment.sa.gov.au/naturemaps/?locale=en-us&viewer=naturemaps NatureMap (Western Australia) https://naturemap.dpaw.wa.gov.au/default.aspx	• Native vegetation overlays • Threatened species • Information on parks, reserves and other protected areas • IBRAs
	Species Profiles and Threats Database (SPRAT) http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl	Recovery/action plans of threatened species
	National Biodiversity Hotspots https://www.environment.gov.au/biodiversity/conservation/hotspots/national-biodiversity-hotspots	Detailed list of biodiversity hotspots and relevant threats.
1.4 Areas with mapped significant seasonal concentrations of species	Birdlife International Data Zone http://datazone.birdlife.org/home	Important bird areas (IBAs)
	RAMSAR https://www.ramsar.org/about/wetlands-of-international-importance-ramsar-sites	Wetlands of international importance
	Protected matters interactive search tool http://environment.gov.au/epbc/pmst/index.html	A reporting tool that provides regional information including: • World heritage properties • Australian Heritage sites • RAMSAR sites • National protected areas • Commonwealth heritage • Nationally Important Wetlands • Reserves and Conservation Areas • Threatened species

		• Threatened ecological communities
	Species Profiles and Threats Database (SPRAT) http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl	Recovery/action plans of threatened species
1.5 Areas of high species/communities' diversity	NatureKit (Victoria) http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit Nature Maps (South Australia) http://spatialwebapps.environment.sa.gov.au/naturemaps/?locale=en-us&viewer=naturemaps NatureMap (Western Australia) https://naturemap.dpaw.wa.gov.au/default.aspx	• Native vegetation overlays • Threatened species • Information on parks, reserves and other protected areas • IBRAs
1.6 Refugia	Google Scholar https://scholar.google.com.au/	Search scholarly articles and resources
HCV 2 level ecosystems and mosaics. Intact forest landscapes and large level ecosystems and ecosystem mosaics that are significant at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance.		
2.1 Landscape-level native forests with successional stages, forest structures, and species composition that are similar in distribution and abundance to native forests that have experienced minimal human disturbance, excluding traditional Indigenous management regimes.	NatureKit (Victoria) http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit Nature Maps (South Australia) http://spatialwebapps.environment.sa.gov.au/naturemaps/?locale=en-us&viewer=naturemaps NatureMap (Western Australia) https://naturemap.dpaw.wa.gov.au/default.aspx	• Native vegetation overlays • Threatened species • Information on parks, reserves and other protected areas • IBRAs
	Protected matters interactive search tool http://environment.gov.au/epbc/pmst/index.html	A reporting tool that provides regional information including: • World heritage properties • Australian Heritage sites • RAMSAR sites • National protected areas • Commonwealth heritage • Nationally Important Wetlands • Reserves and Conservation Areas • Threatened species • Threatened ecological communities

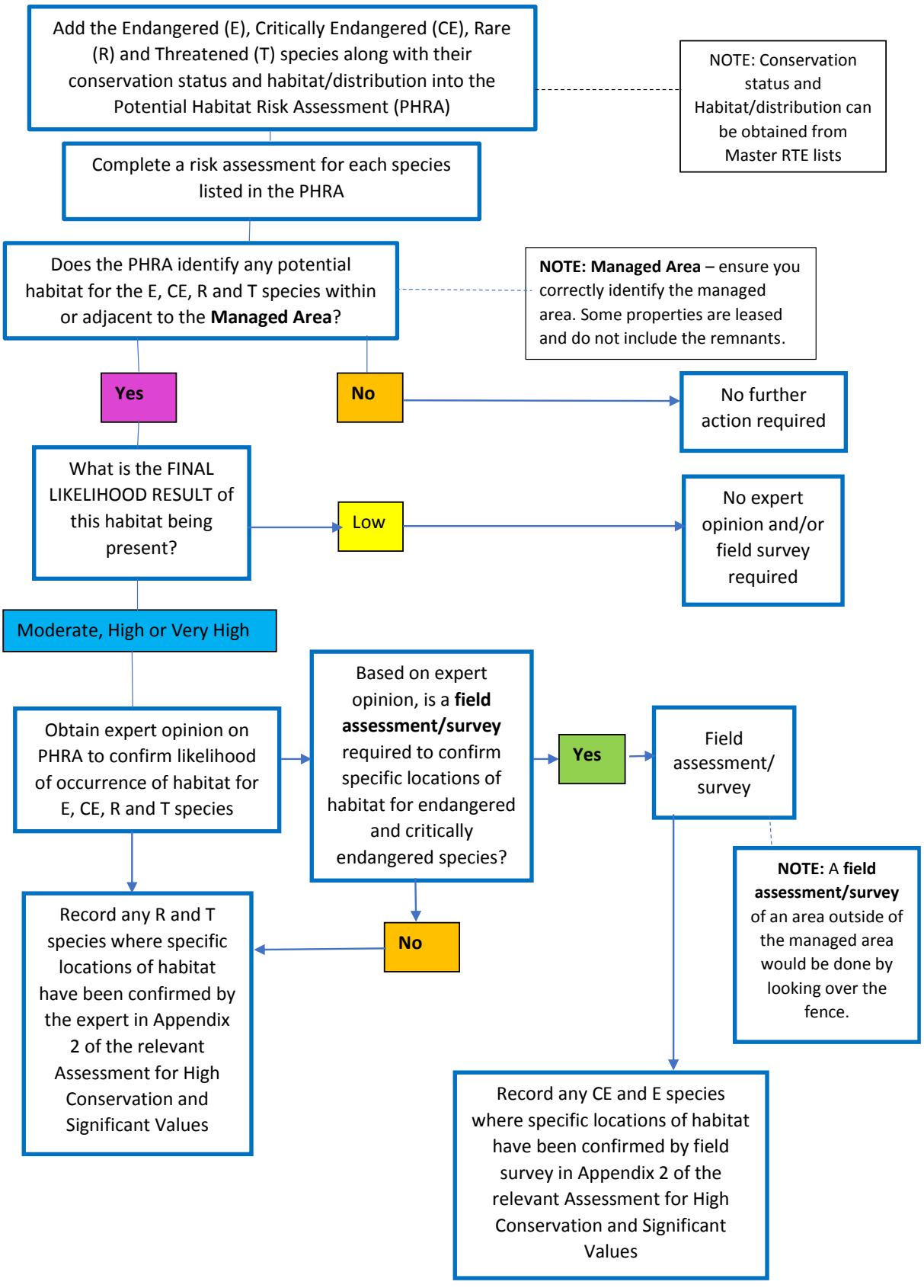
2.2 Forests recognised as being regionally significant at the bioregion or larger scale in formally recognised reports or peer-reviewed journals, due to the unusual landscape-scale biodiversity values provided by size and condition of the forest relative to regional forest land cover and land use trends.	Google Scholar https://scholar.google.com.au/	Search scholarly articles and resources
	Global Forest Watch https://www.globalforestwatch.org/	Change in global forest cover
	Wikipedia – Significant forests of Australia https://en.wikipedia.org/wiki/Forests_of_Australia	List, details and distribution of significant Australian forests
2.3 Forests that provide regionally significant habitat connectivity between larger forest areas and/or refugia.	NatureKit (Victoria) http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit Nature Maps (South Australia) http://spatialwebapps.environment.sa.gov.au/naturemaps/?locale=en-us&viewer=naturemaps NatureMap (Western Australia) https://naturemap.dpaw.wa.gov.au/default.aspx	• Native vegetation overlays • Threatened species • Information on parks, reserves and other protected areas • IBRAs
	Google Maps / Google Earth	Satellite imagery
2.4 Intact Forest Landscapes, wilderness areas, forests that are roadless, and/or have not been affected by forest management activity.	Intact Forest Landscapes Search Tool http://intactforests.org/world.webmap.html	Interactive map of intact forest landscapes
HCV 3 Ecosystems and habitats. Rare, threatened, or endangered ecosystems, habitats or refugia.		
3.1 Ecosystems (including rainforests) that are threatened, depleted or poorly reserved at the IBRA bioregion scale, or are subject to threatening processes predicted to substantially reduce their extent and function.	Protected matters interactive search tool http://environment.gov.au/epbc/pmst/index.html	A reporting tool that provides regional information including: • World heritage properties • Australian Heritage sites • RAMSAR sites • National protected areas • Commonwealth heritage • Nationally Important Wetlands • Reserves and Conservation Areas • Threatened species • Threatened ecological communities
	NatureKit (Victoria) http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit Nature Maps (South Australia)	• Native vegetation overlays • Threatened species • Information on parks, reserves and other protected areas

	http://spatialwebapps.environment.sa.gov.au/naturemaps/?locale=en-us&viewer=naturemaps NatureMap (Western Australia) https://naturemap.dpaw.wa.gov.au/default.aspx	• IBRAs
3.2 Areas for conservation of important genes or genetically distinct populations.	Species Profiles and Threats Database (SPRAT) http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl	A reporting tool that provides regional information including: • World heritage properties • Australian Heritage sites • RAMSAR sites • National protected areas • Commonwealth heritage • Nationally Important Wetlands • Reserves and Conservation Areas • Threatened species • Threatened ecological communities
3.3 Old-growth forest.	Wikipedia – Significant forests of Australia https://en.wikipedia.org/wiki/Forests_of_Australia	List, details and distribution of significant Australian forests
3.4 Remnant vegetation in heavily cleared landscapes and mature forest in degraded landscapes.	NatureKit (Victoria) http://maps.biodiversity.vic.gov.au/viewer/?viewer=NatureKit Nature Maps (South Australia) http://spatialwebapps.environment.sa.gov.au/naturemaps/?locale=en-us&viewer=naturemaps NatureMap (Western Australia) https://naturemap.dpaw.wa.gov.au/default.aspx	• Native vegetation overlays • Threatened species • Information on parks, reserves and other protected areas • IBRAs
HCV 4 Critical ecosystem services. Basic ecosystem services in critical situations, including protection of water catchments and control of erosion of vulnerable soils and slopes.		
4.1 Areas that provide protection from flooding. **4.2** Areas that provide protection from erosion. **4.3** Areas that provide barriers to the spread of destructive fires. **4.4** Areas that provide clean water catchments	Australian Soil Resource Information Centre http://www.asris.csiro.au/index.html	Soil data
	Victorian Resources Online http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/vrohome Natural Resources (SA) https://www.naturalresources.sa.gov.au/home	Government natural resources

	Spatial Data Download (WA) https://www.naturalresources.sa.gov.au/home	
HCV 5 Community needs. Sites and resources fundamental for satisfying the basic necessities of local communities or Indigenous Peoples (for livelihoods, health, nutrition, water, etc.), identified through engagement with these communities or Indigenous Peoples.		
5.1 Unique/main sources of water fundamental for drinking and other daily uses. **5.2** Unique/main sources of water fundamental for the irrigation of subsistence food crops. **5.3** Food and medicines fundamental for local traditional Indigenous uses.	Victorian Resources Online http://vro.agriculture.vic.gov.au/dpi/vro/vrosite.nsf/pages/vrohome Natural Resources (SA) https://www.naturalresources.sa.gov.au/home Spatial Data Download (WA) https://www.naturalresources.sa.gov.au/home	Government natural resources
HCV 6 Cultural values. Sites, resources, habitats and landscapes of global or national cultural, archaeological or historical significance, and/or of critical cultural, ecological, economic or religious/sacred importance for the traditional cultures of local communities or Indigenous Peoples, identified through engagement* with these local communities or Indigenous Peoples.		
6.1 Aesthetic values **6.2** Historic values of global or national cultural or archaeological significance **6.3** Long term research sites. **6.4** Social (including economic) values. **6.5** Spiritual and cultural values.	Indigenous (Australia) https://www.indigenous.gov.au/ Aboriginal Cultural Heritage Register (Vic) https://www.aboriginalvictoria.vic.gov.au/victorian-aboriginal-heritage-register Aboriginal Heritage (SA) https://www.dpc.sa.gov.au/responsibilities/aboriginal-affairs-and-reconciliation/aboriginal-heritage Aboriginal Heritage (WA) https://www.dplh.wa.gov.au/information-and-services/aboriginal-heritage	Indigenous heritage legislation, information and registers
	Heritage Council (WA) http://inherit.stateheritage.wa.gov.au/Public/	Western Australian heritage places
	Heritage Council Victoria https://vhd.heritagecouncil.vic.gov.au/	Victorian heritage places
	Nature Maps (SA) http://spatialwebapps.environment.sa.gov.au/naturemaps/?locale=en-us&viewer=naturemaps	State and commonwealth heritage places
	UNESCO – World Heritage list	Australian world heritage sites

	http://whc.unesco.org/en/statesparties/au	
	Heritage Places (Aus) http://www.environment.gov.au/heritage/heritage-places	Australian heritage places

Appendix 3 – Potential Habitat Risk Assessment (PHRA) process for identifying specific locations of habitat for endangered, critically endangered, rare and threatened species



Appendix 4 - High Conservation Value criteria and guidance for assessment process

High Conservation Value (HCV)	
Criteria	**Guidance for Assessment**
HCV 1 –Species diversity. Concentrations of *biological diversity* including endemic species, and *rare*, *threatened* or endangered species, that are *significant* at global, regional or national levels. Best available information to include where applicable: • Recovery plans and related documents • Habitat* mapping • Databases • Peer reviewed journal articles • Reports by government bodies and credible institutions, organisations and experts • Expert research and advice (including for high SIR operations, provided by a locally knowledgeable expert independent of the organisation) • Expert and knowledgeable stakeholder data • Field surveys	
HCV1.1 Areas that contain significant concentrations of rare and threatened species or that contain habitat critical to the survival and long term viability of these species	Does the MU contain (or likely to contain) several species listed as rare, threatened or endangered in accordance with International Union for Conservation of Nature (IUCN), under the EBPC Act or regional legislation and/or other requirements? **YES = HCV**
	Does the property contain habitat critical* to the survival and long term viability of these species? **YES = HCV**
HCV1.2 T Areas that contain centres of endemism	Are there several endemic species that are likely to occur within the MU area? **YES = HCV**
HCV1.3 Areas that contain significant concentrations or rare species that are poorly reserved at the IBRA region scale	Does the MU have specific areas where there are a significant number of multiple species or where is a proportionately large population of an individual species? **YES = HCV**
HCV1.4 Areas with mapped seasonal concentrations* of species	Does the MU have areas important to the lifecycle or migration paths of migratory and communal breeding species? **YES = HCV**
HCV1.5 Areas of high species/communities' diversity	Does the MU contain areas where there is a high diversity of species and communities? **YES = HCV**
HCV1.6 Refugia	Does the MU have an isolated area where extensive changes, typically due to changing climate or disturbances such as those caused by humans, have not occurred and where plants and animals typical of a region may survive? **YES = HCV**

HCV 2 –Landscape-level *ecosystems* and mosaics. Intact forest *landscapes* and large *landscape* -level *ecosystems* and *ecosystem* mosaics that are *significant* at global, regional or national levels, and that contain viable populations of the great majority of the naturally occurring species in natural patterns of distribution and abundance. Best available information to use where applicable: • Mapping and other data on forest cover, age, succession, structure, species composition, habitat* connectivity, anthropogenic disturbance, roadless areas, wilderness, and intact forests • Peer reviewed journals, government or expert reports and data identifying significant landscape*-level forests • For Intact Forest Landscapes*, mapping and data from Global Forest Watch and World Resource Institute.	
HCV2.1 **Landscape-level* native forests* with successional stages, forest structures, and species composition that are similar in distribution and abundance to native forests* that have experienced minimal human disturbance, excluding traditional Indigenous* management regimes.**	Does the MU contain areas: • In close proximity to each other; • Thousands or tens of thousands of hectares in size; • Have similar successional stages, structure, species composition; • Similar in distribution and abundance to native forests; and • Have experienced minimal human disturbance **YES = HCV**
HCV2.2 Forests recognised as being regionally significant at the bioregion or larger scale in formally recognised reports or peer-reviewed journals, due to the unusual landscape*-scale* biodiversity values provided by size and condition of the forest relative to regional forest land cover and land use trends.	Does the MU contain forests that are thousands or tens of thousands of hectares in size which are formally recognised reports or peer reviewed journals, due to the unusual landscape scale biodiversity values provided by size and condition of the forest relative to regional forest land cover and land use trends? **YES = HCV**
HCV2.3 Forests that provide regionally significant habitat* connectivity* between larger forest areas and/or refugia*.	Does the MU contain areas of forest that are thousands of tens of thousands in size which provide significant habitat connectivity between larger forest areas and/or refugia**?** **YES = HCV**
HCV2.4 Intact Forest Landscapes*, wilderness areas, forests that are roadless, and/or have not been affected by forest management activity.	Does the MU contain areas of intact forest landscapes*, wilderness areas, forests that are roadless and/or have not been affected by forest management activity? **YES = HCV**
HCV 3 –*Ecosystems* and *habitats*. *Rare*, *threatened*, or endangered *ecosystems*, *habitats* or *refugia*. Best available information to use where applicable: • Ecosystem* protection* and conservation status at IBRA* scales • Old-growth forest* • Forest cover and disturbance • Forest maturity	

• Anthropogenic disturbance at the landscape scale.	
HCV3.1 Ecosystems* (including rainforests) that are threatened, depleted or poorly reserved at the IBRA* bioregion scale, or are subject to threatening processes predicted to substantially reduce their extent and function.	**Does the MU…** Contain particular ecosystems that are threatened, depleted or poorly reserved at the IBRA bioregion scale or subject to threatening processes predicted to substantially reduce their extent and function? **YES = HCV**
HCV3.2 Areas for conservation* of important genes or genetically distinct populations.	Does the MU contain areas for conservation of important genes or genetically distinct populations? **YES= HCV**
HCV3.3 Old-growth forest*.	Does the MU contain old growth forest? **YES = HCV**
HCV3.4 Remnant vegetation in heavily cleared landscapes and mature forest in degraded landscapes.	Does the MU have remnant vegetation in heavily cleared landscapes and mature forest in degraded landscapes*? **YES = HCV**
HCV 4 –*Critical ecosystem services*. Basic *ecosystem services* in *critical* situations, including *protection* of water catchments and control of erosion of vulnerable soils and slopes. Best available information to use where applicable: • Flood risk • Soil erodibility and erosion risk • Fire risk and behaviour in the landscape • Water catchment location and water quality.	
HCV4.1 Areas that provide protection* from flooding.	Does the MU contain areas that provide protection from flooding? **YES = HCV**
HCV4.2 Areas that provide protection* from erosion.	Does the MU fall within an existing erosion protection prioritisation scheme or critical erosion area? (Critical erosion areas would include where there is a risk of serious erosion, landslides and avalanches.) If YES, does the MU play a critical role in protecting against erosion? (The MU will **NOT** play a critical role if the MU only contains a small area of vulnerable soils or the topographic situation of the MU protects against severe erosion). **IF YES = HCV**
HCV4.3 Areas that provide barriers to the spread of destructive fires	Is the MU within a high-risk fire area? **If yes** does the FMU…. Contain forest types that naturally act as a barrier to fire? **YES=HCV** Contain areas covered by forest types too small to act as barriers against uncontrolled destructive fire? YES. **DOES NOT = HVC** Contain human settlements or communities within or adjacent to the MU? **YES=HCV**

HCV4.4 Areas that provide clean water catchments.	Does the MU… Fall within identified critical catchment or watershed areas? If YES, does the MU play a critical role in protecting the catchment area? (The FMU will play a critical role is the catchment area is not largely forested or the FMU covers a large proportion of the catchment) **IF YES = HCV**
HCV 5 –Community needs. Sites and resources fundamental for satisfying the basic necessities of *local communities* or *Indigenous Peoples* (for livelihoods, health, nutrition, water, etc.), identified through *engagement* with these communities or *Indigenous Peoples*. Best available information to use where applicable: Mapping, reports, expert and stakeholder* consultation and other data on unique and primary sources of water for daily uses and the location of areas that provide traditional food and medicines.	
HCV5.1 Unique/main sources of water fundamental* for drinking and other daily uses.	Does the MU contain unique and/or main sources of water fundamental for drinking and other daily uses? **YES = HCV**
HCV5.2 Unique/main sources of water fundamental* for the irrigation of subsistence food crops.	Does the MU contain unique and/or main sources of water fundamental for the irrigation of subsistence food crops? **YES = HCV**
HCV5.3 Food and medicines fundamental* for local traditional Indigenous* uses.	Does the MU contain food and medicines fundamental for local traditional Indigenous uses? **YES = HCV**
HCV 6 –Cultural values. Sites, resources, *habitats* and *landscapes* of global or national cultural, archaeological or historical significance, and/or of *critical* cultural, ecological, economic or religious/sacred importance for the traditional cultures of *local communities* or *Indigenous Peoples*, identified through *engagement* with these *local communities* or *Indigenous Peoples*. Best available information to use where applicable: • Mapping • Reports • Databases • Field surveys • Expert and knowledgeable stakeholder* consultation.	
HCV6.1 Aesthetic values.	Does the MU contain areas that have aesthetic value? **YES = HCV**
HCV6.2 Historic values of global or national cultural or archaeological significance.	Does the MU contain sites that have historic values of global or national, cultural or archaeological significance? **YES = HCV**
HCV6.3 Long term research sites.	Does the MU contain sites that are used for long term research? **YES = HCV**
HCV6.4 Social (including economic) values.	Does the MU contain area of social and economic value? **YES = HCV**
HCV6.5 Spiritual and cultural values.	Does the MU contain areas of spiritual and cultural value? **YES = HCV**

Appendix 5 – Framework for hygiene management planning