Environmental Works

Conservation Management Plan User Manual

NILLUMBIK
THE GREEN WEDGE SHIRE

Date Prepared: November 2012

Table of contents

1 Introduction

Nillumbik Shire Council is responsible for the management of 99 environmentally significant reserves covering an area of 495 hectares on both Council freehold land and as the Committee of Management for Crown Land. The primary purpose of these reserves is for the conservation of natural values; however they are also important from a social, cultural and historical perspective. These reserves are home to an array of native plants and animals, and often provide the last remaining refuges for threatened and endangered species in a fragmented landscape.

Council's Environmental Works (EW) Team actively manages these reserves by undertaking a range of works such as weed and rabbit control, species conservation, fencing, trail maintenance and fuel reduction works to protect and enhance their biodiversity and community values.

EW develops yearly works programs for a number of the bushland reserves. Historically, yearly works programs have been developed in response to a number of factors including:

- Community expectations and pressures
- Presence of rare or threatened species or communities
- Presence of threatening processes
- Conservation value of the reserve
- Presence of an active Friends Group
- On-going historic management of the reserves

To provide a holistic and strategic approach to managing Council's bushland and wetland reserves all reserves will have an individual Conservation Management Plan (CMP) developed which outlines the values, threats and management objectives for that reserve.

To implement the CMPs, EW will also develop a five-year works objective. The works objective will detail the actions required to achieve the management objectives specified in the CMP. It also provides a tool for communicating with contractors and reporting on progress and achievements. Works objectives may specify actions up to five-years, however they will be translated into annual works programs for contractors.

The purpose of this manual is to provide staff within EW guidelines for how to develop a CMP, how to develop works objectives and an annual works plan and how to monitor and review works within reserves.

The process for developing CMPs and works plans follows the process outlined in the Environmental Works Reserves Prioritisation and Planning Guidelines (Figure 1).

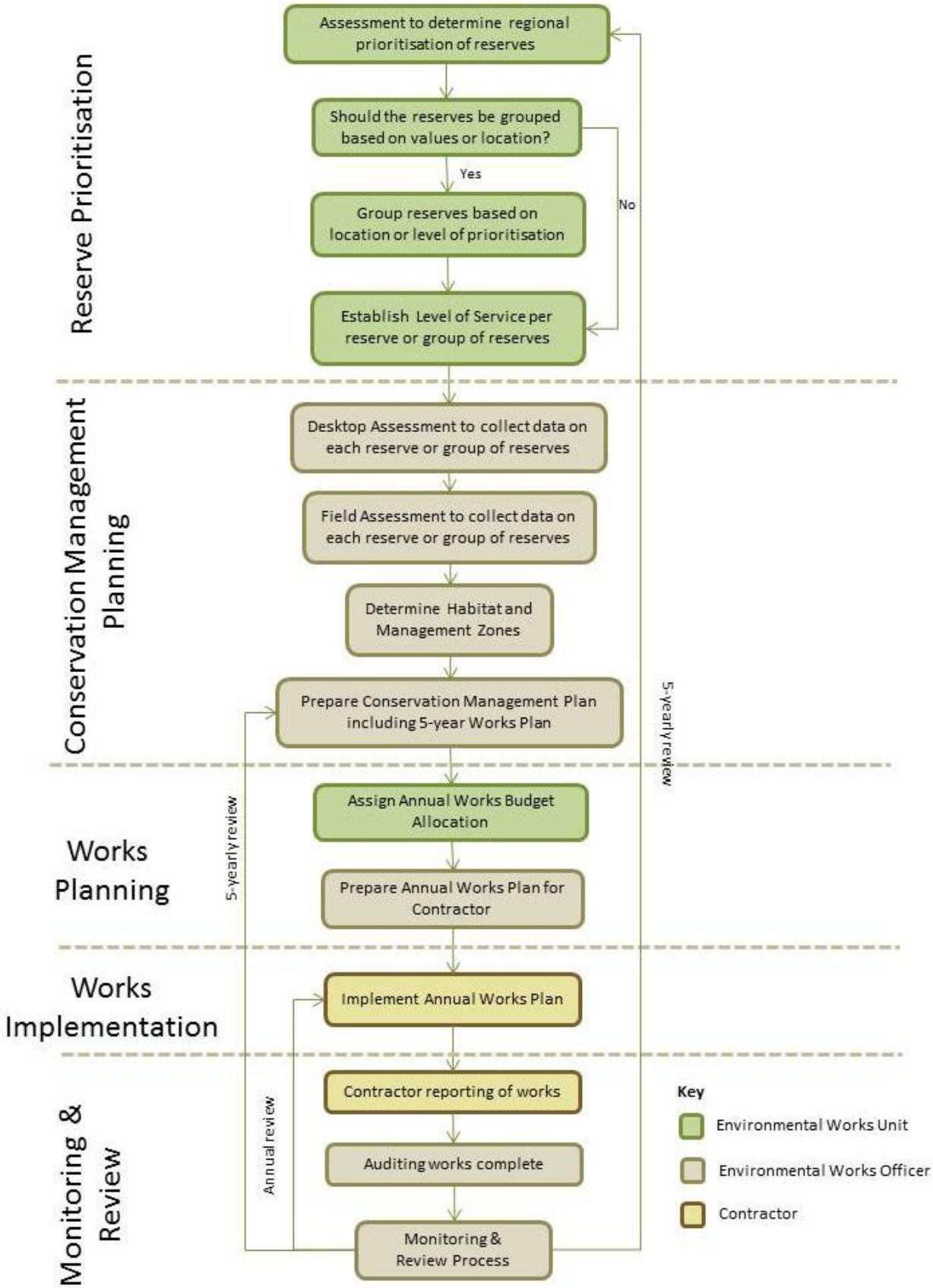

Figure 1: Environmental works cycle

Planning is essential for on-ground environmental works. Good plans enable land managers to manage works over several years and/or over large areas. The best plans constantly evolve based on the outcome of control works and changes in environmental condition through a cycle of **plan**, **do** and **review** (see Figure 2).

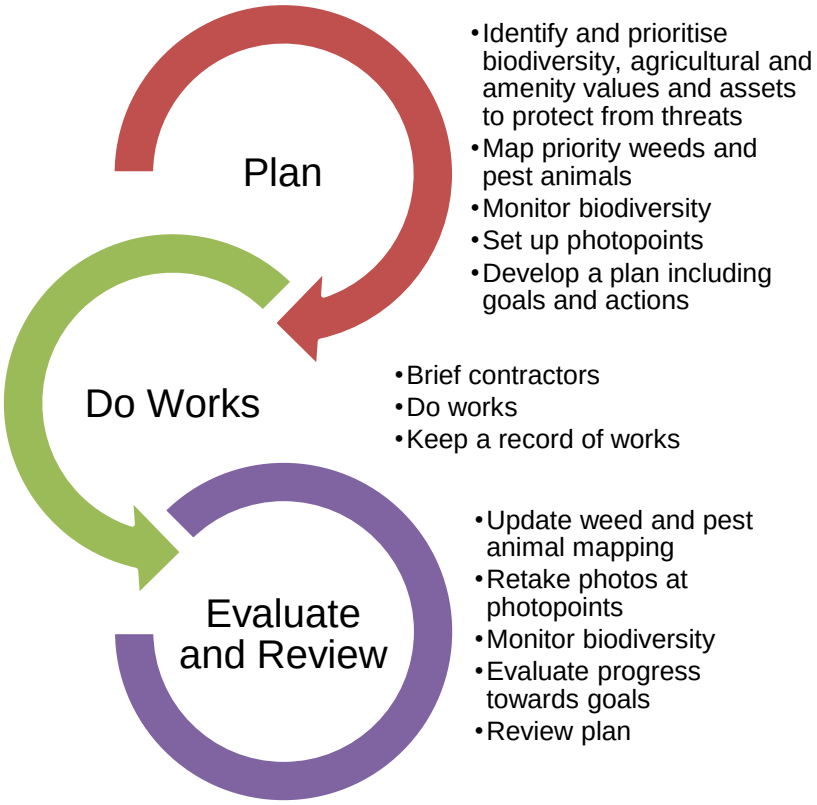

Figure 2: Plan, Do and Review

2 Reserve Planning

2.1 Desktop Assessment

The first step when developing a Conservation Management Plan for a reserve is to collect as much background information relating to the reserve and surrounding as possible. This will assist you in formulating and developing the context of the reserve and the management of the reserve to date.

This information will include:

- **Site Information**
  - Location of the reserve
    - Street location/address
    - Catchment location
    - Landscape location
  - Area (hectares)
  - Land management arrangements
  - Level of Service as specified by the Reserves Prioritisation and Planning Guidelines
- **Planning and policies**
  - Planning overlays or zones (ESO, WMO, PCRZ)
  - Previous studies
    - Vegetation Management Plans
    - Fire Management Plans
    - Streamflow Management Plans
- **Historical land uses**
  - Indigenous cultural heritage sites
  - European usage if known
- **Physical environment**
  - Topography
  - Soils / Geology
  - Hydrology
    - Streams
    - Wetlands
- **Level of significance**
- **Landscape context/connectivity**
- **Community values**
- **Stakeholders**

This information will be used to inform the Site Overview section of the Conservation Management Plan. The Site Overview section provides s background and introduction to the site. It discusses the environmental and landscape context of the site as well as presenting broad overview/background of the management of the bushland at the site to date.

2.2 Collecting and collating the Site Overview information

Category	Item	What Information?	Where to find it?
Site Information	Reserve Location	Property address or physical boundaries such as roads or waterways	• Open the Conservation Management Planning MapInfo Workspace • Navigate to your reserve • Use the  to get information about the property address
		Describe the location of the reserve within the catchment. i.e. is the reserve part of the Yarra or Plenty River catchments, is it located at the headwaters or at the confluence	• Information relating to catchment location can be obtained from Melbourne Water's Healthy Waterways Strategy (draft) • Refer to Melbourne Water's Regional River Health Strategy 2008-2013
		Described the location of the reserve within the landscape. Is it close to a township or is it surrounded by farms?	• Use the Conservation Management Planning MapInfo Workspace to locate the reserve. • Review aerial photos to determine surrounding land uses. • Use the  to measure distances to nearest patch of vegetation, townships or other significant landscape features.
	Area (hectares) and shape	Provide a description of the area of the reserve in hectares, and also the shape of the reserve i.e. long and thin, rectangular, square	• Using the Conservation Management Planning Workspace, go to Map>>Options. • Set the Map Units>>Area Units to hectares • Click Ok, and then double click the arrow on your reserve. This will generate the reserve area.

Category	Item	What Information?	Where to find it?
	Land Management Arrangements	Provide a description of the management arrangements for the reserve. Is the reserve owned by Council or is it under a Committee of Management?	• Use the Conservation Management Planning Workspace to check Crown Land. • Use the property information to get landowners details. • Refer to Council's List of CoM
	Level of Service	Use the Reserves Prioritisation and Planning Guidelines to provide a description of the Level of Service for the reserve	• ..\Reserves Prioritisation and Planning Guidelines.docx
Planning and Policies	Planning Overlays and Zones	Provide an outline of what Planning Overlays and Zones might affect the reserve. These might include Environmental Significance Overlays, Wildfire Management Overlays or Public Conservation Resource Zone.	• Using the CMP Workspace, go to the Layer Control and open the Overlays and Zones folder • Select all the layers • Use the  to get information relating to the zones and overlays
	Previous Studies	A number of Council's bushland and wetland reserves have previous studies such as flora and fauna reports, fire management plans or net gain assessments. This information will be useful in forming a view of management required.	• Using Windows Explorer, navigate to the particular reserves folder. • Open the folder relating to Reports • Explore folder to see if there are any existing reports. • Check the EW cupboard to see if hard copies exist
	Historical Land Use	Provide an overview of any sites of Indigenous Cultural Significance either within your reserve or surrounding areas.	• Check DPCD Areas of Cultural Sensitivity Maps. Select the Ringwood map to see if any areas have particular cultural sensitivity • Use the CMP Workspace, Aboriginal Sites Grid to determine particular sites of significance.

Category	Item	What Information?	Where to find it?
		Provide an overview of post-European Settlement land use if known.	• Post-European historical land use may be difficult to determine, but may be available in existing reports relating to the reserve. • From the Field Assessment you may be able to infer past landuse practices such as vegetation clearance or the presence of fences or mines.
Physical Environment	Topography	Provide a description of the topography of the site, including steepness, aspect, form and elevations.	• Use the contours layer in the CMP Workspace to determine steepness, aspect. • Use the  tool to select the contours and determine height above sea-level.
	Soils / Geology	If known, provide a brief overview of the soil type and geology of the site	• DSDPI Earth Resources Online website has PDF geological maps at various scales • Some of these maps have been saved as PDFs within the CMP folder
	Hydrology	Provide a description of the hydrology of the site. Are waterways or gullies present on the site? Are there any wetlands present?	• Use the contours and waterways layers in the CMP Workspace to determine the presence of gullies or waterways. • Aerial photos may also show changes in vegetation to indicate wetter or drier areas.
Level of Significance	Significance of the site	Discuss the level of significance of the site. Is the site listed as a DSE Biosite? Is it listed under NEROC as a site of significance or part of a habitat corridor?	• In the CMP Workspace use open the Level of Significance layers to view both NEROC and DSE Biosite Information. • For further information relating Biosites click here DSE Biosites in Nillumbik • For further information relating to NEROC sites obtain an electronic copy of the NEROC Report

Category	Item	What Information?	Where to find it?
	Significant Fauna	Put together a list of all significant fauna species likely to be present at the site.	• Use the Victorian Biodiversity Atlas. • Use a 2km radius to determine species likely to occur within the area, reduce the list based on if the species is likely to be present. • Augment the list with local knowledge of species or from fauna reports from the area.
	Significant Flora	Put together a list of all significant flora species that are likely or are known to be present at the site.	• Use the Victorian Biodiversity Atlas. • Augment the list with local knowledge of species or from flora reports from the area.
Landscape Context and Connectivity	Landscape Context and Connectivity	Provide a description of the reserve's location within the landscape and its role in landscape connectivity. • Is the reserve part of an existing habitat corridor, or is there potential for it to be part of a new habitat corridor? • What is the proximity of the reserve to other patches of native vegetation?	• Use aerial photos to determine the location of the reserve within the landscape. • Refer to Strategic Documents such as the Biodiversity Strategy 2012 or the NEROC Report to determine if the reserve is part of an existing habitat corridor. • Use DSE's Biodiversity Interactive Map to assist in determining Landscape Context and Connectivity Scores.
Community Values	Friends Group / Community Interest	Discuss the details of any Friends or Community Groups currently or previously known to work on the site. Is the group active or is activity diminishing?	• Use the Conservation Management Planning Workspace to identify if a Friends Group is active at your site. • The Friends Group Manual may also provide useful information

Category	Item	What Information?	Where to find it?
	Recreational Use	Discuss and describe the recreational use of the reserve. Is it currently used for passive or active forms of recreation? Are there recreational trails through the reserve?	• Contact Leisure Services to determine recreational use of reserves
Stakeholders	Other Agencies	Discuss the involvement of other stakeholders in the management of the site. If there is a waterway is Melbourne Water undertaking works?	•
	Neighbours	Discuss the details of adjoining property owners. Are there any existing relationships or arrangements with the neighbours?	• Using the Conservation Management Planning Workspace, you can use the  tool to select properties around the reserve and view the surrounding property owners details. • The reserve folder may also contain relevant information about pre-existing arrangements with surrounding landowners.

3 Site assessment

The next step in the development of the Conservation Management Plan and Works Plan is to undertake a site assessment of the reserve.

3.1 Pre-visit Preparation

To undertake the site assessment of the reserve you will need to take the following items:

- Clipboard and Pencil
- PDA/Tablet
- Camera
- Diameter Tape
- Field Sheets
    - Treeless Vegetation Quality Assessment Sheet
    - VQA Life form recording sheet
- Maps
    - EVC and Bioregion Maps – determine the EVCs likely to be present at the site prior to visiting
    - Aerial Photograph
    - Directions
- EVC Benchmarks
- OH&S Equipment
- Overall Fuel Hazard Assessment Guide
- Pegs / Equipment to set up photopoints
- VQA Manual

3.2 Reconnaissance

Walk and drive around the site to formulate an idea of the:

- Spatial distribution of the vegetation
- Remnant patches
- Identification and distribution of EVCs
- Quality differences within EVCs
- Presence/absence of high threat weeds
- Presences/absence of feral animals
- Adjoining land management practices
- Other potential issues/threats or features of note.

3.3 Vegetation Quality Assessment

Note: This section will be updated once the new Habitat Hectare methodology has been finalised.

Undertake a Vegetation Quality Assessment of the site using the Habitat Hectares Approach. Use the Vegetation Quality Assessment Manual, the Vegetation Quality Assessment Sheet and the EVC benchmarks to undertake the assessments.

Step 1: Identify Habitat Zones within the Reserve

Step 2: Identify Ecological Vegetation Classes for each Habitat Zone

Step 3: Undertake a Vegetation Quality Assessment for each identified Habitat Zone

Once you have completed the Vegetation Quality Assessment for the reserve, you will need to input the data into Appendix D of the Conservation Management Plan, as well as updating the Habitat Zones table in MapInfo (see 4.3 Habitat Zones).

3.4 Weed/Threats Mapping

Using Council's PDA map and record information on weeds or other threatening processes observed. These may include:

- Weeds
- Pest Animals
- Erosion
- Rubbish
- Encroachments
- Drainage/stormwater

The Environmental Works Mapping Data Fields document outlines the fields within the PDA that need to be collected. ..\..\..\Administration\Policies_Procedures\GIS\Environmental Works mapping data fields.docx

3.5 Fuel Hazard Assessments

By undertaking an Overall Fuel Hazard Assessment you can:

- Make a rapid, visual assessment of fuel arrangement; and
- Gain an understanding of how this will affect the changes of controlling a bushfire.

Using the PDA and the Overall Fuel Hazard Assessment Guide, undertake a number of representative fuel hazard assessments across the reserve.

3.6 Significant Species

Use the PDA to map and record the presence of any significant flora and fauna species that you might encounter during the site assessment. This data will be used to augment the list you have previously generated using the Atlas of Victorian Wildlife and the Flora Information System.

3.7 Infrastructure

Use the PDA to map and record any infrastructure that might occur in the reserve. This may include infrastructure such as:

- Signs
- Fences
- Gates
- Seats
- Erosion control structure

3.8 Other Issues

Use the PDA to map and record other issues that you might observe within the reserve. Other issues may include but are not limited to:

- Cubby Houses
- Mines
- Graffiti
- Vandalism
- Illegal trails
- Historically significant sites

3.9 Photopoint monitoring

Photopoints are permanent or semi-permanent sites from where you can take a series of photographs which can be used to provide a visual record of changes over time. EW uses photopoints to demonstrate how issues such as vegetation condition and weed cover change. The following section provides a description of how to set up photopoints and manage the associated data.

The pictures for comparison are taken at the same location, with the same direction angle, focus points and preferably camera settings. Photographic records provide a permanent visual record of change without reliance on memory or taking physical measurements, and are used to support other monitoring efforts where data is being collected.

The number of photopoints you set up will depend on the variation in the vegetation and your ability to repeat photos. In general, take photos in spring and repeat once a year.

There are also many internet resources that provide advice on where to place photopoints, how to use them and how to take the photos (in particular, DSE's *Land for Wildlife Note 43: Photopoint monitoring* and *BushTender Information Sheet 17: Photopoint monitoring*).

EW have 2 PDAs and a tablet set up to record the location and details of photopoints using Crest. Data collected on the units feeds directly into Nillumbik's Environmental Monitoring database.

Figure 3: Example a photopoint (growth of grassy weeds before and after a wet year)

Action

To set up the initial photopoint:

In the field (overcast days are best):

1. Bring:
   - Tablet/PDA
   - Camera (make sure camera date setting is correct)
   - Compass
   - Optional: Pegs/ star pickets/ markers / spray paint / mallet
   - Optional: Printed maps (useful if marked with potential photopoint locations)
2. Choose appropriate locations to set up photopoints, such as locations that:
   - are representative of the site
   - show a significant weed threat
   - represent the most significant vegetation at greatest risk
   - areas where you are going to do works and want to see the impact
3. Take the photo. If possible keep the camera on automatic settings and no zoom (so it is easy to take a second similar photo at a later date). If possible, face the photo south east and show as little skyline as possible.
4. Record the location on the PDA using the Environmental Monitoring fields as listed in Table 1.
5. If the point will be hard to relocate, mark the location with a durable marker (e.g. a peg, a star picket or by spray-painting a fencepost or tree).

At the computer:

6. Download your Tablet/PDA data.
7. Create a folder in the reserves “Photo” folder called “Photopoints” and then within this folder create another folder named the date you took the photos. The date on the folder should be in YYYYMMDD format. Download the photos into this folder. For easily comparing the photos you could number your photos (you can also include the number of the point in the GIS data).
8. Optional: Insert a hyperlink to the photopoints folder in the MapInfo table file (as per Table 1). If the photo is within a reserve it will be obvious where the photos are located so this isn’t necessary.

To take subsequent photos at the photopoint:
In the field:

1. If possible, take the photo in the same conditions as the previous photo.
2. Bring:
   - Tablet/PDA with previous photopoints loaded
   - Camera (make sure camera date setting is correct)
   - Compass
   - Previous photos
   - Optional: Printed maps with previous photopoints shown
3. Relocate your photopoint using previous photos and the PDA.
4. Line up the photo to match the previous photo and take the photo.

At the computer:

5. Download photos and place in the Reserve Folder under Photos.
6. Create a folder in the reserves “Photo/Photopoints” folder named with the date you took the photos. The date on the folder should be in YYYYMMDD format. Download the photos into this folder. For easily comparing the photos you could number your photos “Photopoints_date”.

Table 1: Data fields for recording photopoints

Field	Field Type	Field Options	Field Description	Form
AssetID	Character (100)	Automatic	Unique identifier for each parcel of land.	1 AssetID
InspectionID	Integer	Automatic	Unique identification code (ID) that provides a reference to a particular record.	2 InspectionID
Inspector	Drop-down Character (100)	Automatic based on login list of names Automatic	Name of people/person doing the monitoring	3 Inpsector
InspectDate	Date/Time	Automatic	Date record taken.	4 InspectDate
Organisation	Drop-down Character (100)	Automatically “Nillumbik Shire Council”	Name of the organisation doing the monitoring.	5 Organisation
Type	Drop down	Photopoint	Type of monitoring. If “Other”,	6

Field	Field Type	Field Options	Field Description	Form
	Character (100)	Vegetation Monitoring Plot	enter monitoring type in Comments.	Type
		Trail Monitoring Point		
		Orchid Cage		
		Nest Box		
		Artificial Hollow		
		Habitat Tile		
		Fauna survey		
		Flora survey		
		Fauna camera		
		Transect		
		Other		
Direction_Photopoint	Drop-down Character (30)	North	Direction the photographer faces for photopoints.	7 Photopoint Direction
		North East		
		East		
		South East		
		South		
		South West		
		West		
		North West		
Comments	Character (254)		Results, location of monitoring point, description of monitoring, duration of monitoring, description of photo, camera settings, camera used, weather conditions, etc.	8 Comments
Data_Location	Character (254)		File location of monitoring data.	Not on form

4 Management Zones

When putting together the final CMP it is important to define a range of Zones which will assist in the on-going management of the reserve.

4.1 Management Zones

Using a hard copy map, define management zones for the reserve. Management zones will be used to group areas of the reserve that have similar management/maintenance requirements. These zones may be very site specific i.e. Wetland Zone, Glycine Zone, Revegetation Zone or may use the categories outlined in the table below.

Once you have determined the zones on the hard copy map, transfer the information to the appropriate Management Zones table in MapInfo. Use the Conservation Management Planning MapInfo Workspace and edit the Management Zones table.

Table 2: Management Zones descriptions

Core Habitat (& Biodiversity Hotspots)

- Areas of **Core Habitat** provide refuge for native plants and animals to live, reproduce and flourish. Protecting, improving and connecting core habitat areas is the highest priority for nature conservation, to maintain ecological function at a landscape scale.
- Within these **Core Habitat** areas may be hotspots of biodiversity (**Biodiversity Hotspots**). Biodiversity Hotspots provide important habitat for the most sensitive species and/or contain a particularly high diversity native plants and animals. The presence of sensitive species and/or habitat means that even low numbers of weeds may significantly impact these areas.
- Core habitat has most of the following attributes:
  - Structurally intact - contains under-storey, mid-storey and canopy species with a broad age class distribution (depending on the vegetation type)
  - Support a high diversity of native plants and animals
  - Old growth, hollow bearing trees (although much high quality bushland in Nillumbik has no or few old growth trees due to extensive logging in the past)
  - Contribute to healthy creeks and rivers (when present)
  - Large and connected to other bushland by wide (>50m) corridors of vegetation
  - Support threatened and significant plants and animals

  Note: Very little bushland in Victoria meets all these criteria; so consider an area to be core habitat if it contains most of these attributes.
- Because these areas are largely intact, they are resilient to most weed invasion and regenerate easily after control works.
- Weed control has immediate and long-term benefits.



Rehabilitation Areas

- **Rehabilitation areas** are areas of lower quality bushland compared to core habitat. These areas may:
  - Be missing important structural elements (e.g. under-storey, mid-storey or canopy species)
  - Have a moderate or low diversity of native species
  - Be isolated within an agricultural or urban landscape
  - Have been subject to significant disturbance in the past
- Although degraded these areas may:
  - provide a buffer to weed and pest animal invasion between cleared areas and core habitat
  - provide corridors for movement of animals between areas of core habitat
  - provide habitat for the more common native plants and animals
- Rehabilitation areas are:
  - prone to weed invasion and may provide a source of weeds to core habitat
  - don't regenerate easily after control works and are therefore subject to reinvasion by weeds
- Weed control has limited benefits in the short-term except to protect surrounding core habitat and prevent further degradation.
- In the long-term, concerted effort in these areas provide the greatest opportunity to expand the areas of core habitat and improve ecological function at a landscape scale.



Cleared/degraded areas

- **Cleared or degraded areas** are areas that support mostly exotic and few native plants
- Cleared or degraded areas:
  - are often heavily invaded by weeds and may provide a source of weeds to other areas
  - don't regenerate easily after control works and are therefore subject to reinvasion by weeds.
- Weed control has limited benefits except to manage source infestations that may spread into higher quality areas.
- Weed control will probably require a significant change in associated land management (e.g. restrict disturbance and manage nutrient inputs (e.g. exclude stock & rabbits)
- Cleared or degraded areas provide a potential for revegetation of native species to buffer or link core habitat areas.


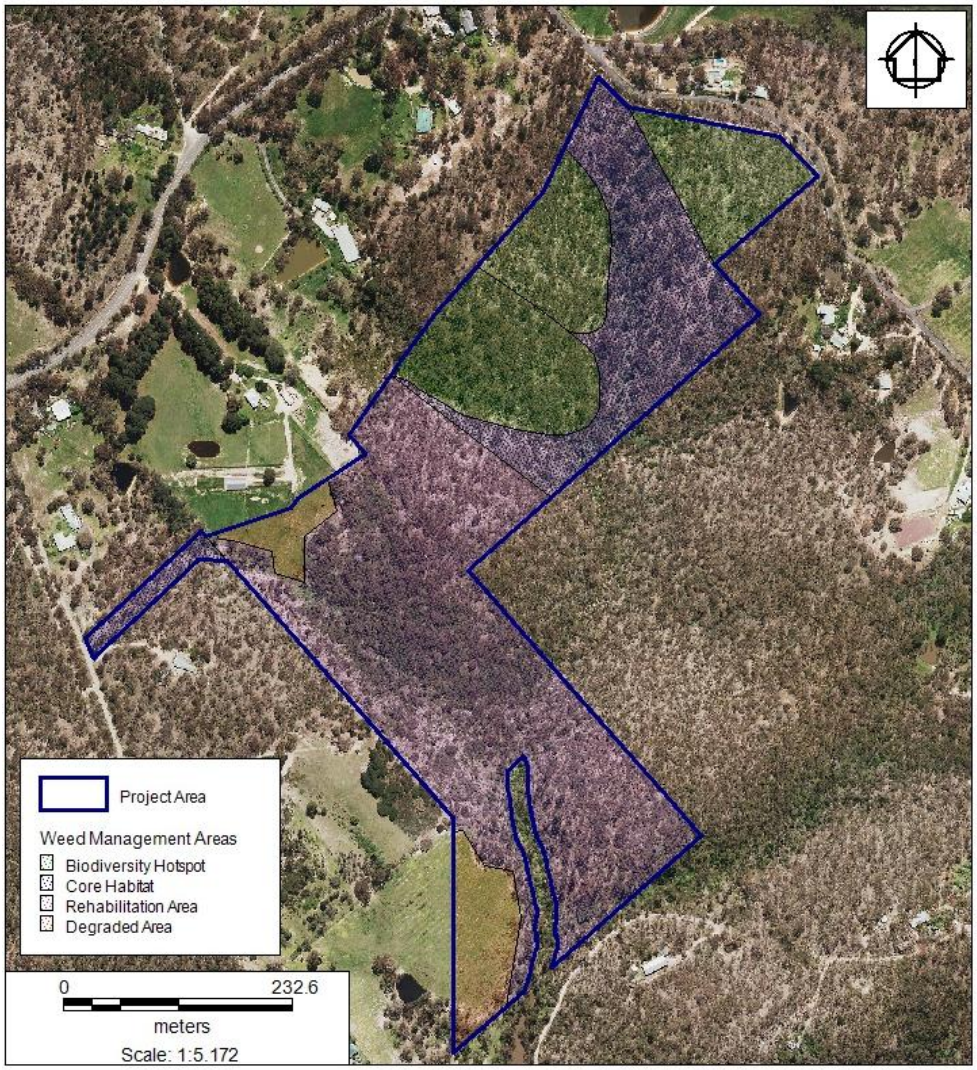

Figure 4: Example of establishing management zones – Bulwidj Reserve

4.2 Fuel Management Zones

Fire Prevention Works within Council's bushland and wetland reserves adopt a risk-based prioritisation approach to preventing fires starting within Council's reserves and spreading to adjoining properties. This approach is outlined in the Environmental Works Fuel Modification Methodology.

However, at the reserve scale Fuel Management Zones (FMZs) can be used as a tool to determine a range of activities that can eliminate or reduce the incidence, severity or impact of fire events that may impact surrounding residents and the community.

The DSE Code of Practice for Bushfire Management on Public Land (2012), outlines four revised FMZs. The four Fire Management Zones are:

- Asset Protection Zone
- Bushfire Moderation Zone
- Landscape Management Zone
- Planned Burning Exclusion Zone

FMZ placement is determined through analysis conducted in the development of strategic bushfire management plans, with input from stakeholders.

Considerations include: risk to human life and property and community infrastructure, practical and achievable burning outcomes, appropriate fire regimes for vegetation types, maximum overall fuel hazard ratings, topographical alignments, and bushfire behaviour.

Table 3: Fuel Management Zones (adapted from DSE Code of Practice for Bushfire Management on Public Land 2012)

Fuel Management Zone	Zone Description
Asset Protection Zone	Using intensive fuel treatment, the Asset Protection Zone (APZ) aims to provide the highest level of localised protection to human life and property and key community assets. The goal of fuel treatment in the APZ is to reduce radiant heat and ember attack in the event of a fire. Fuel treatment will be carried out in the APZ through a combination of methods such as mowing, slashing, vegetation removal or burning.
Bushfire Moderation Zone	This zone aims to reduce the speed and intensity of bushfires. This zone complements the APZ in that the use of fuel reduction techniques in the BMZ is designed to protect nearby assets, particularly from ember spotting during a bushfire. Where practicable, the BMZ will aim to achieve ecological outcomes by seeking to manage for ecologically desirable fire regimes, provided bushfire protection objectives can still be met. This may include using a range of fuel management methods.
Landscape Management Zone	Within this zone, planned burning will be used for three broad aims: • bushfire protection outcomes by reducing the overall fuel and bushfire hazard in the landscape • ecological resilience through appropriate fire regimes • management of the land for particular values including forest regeneration and protection of water catchments at a landscape level. Other fuel reduction methods will be used within this zone as appropriate.
Planned Burning Exclusion Zone	This zone excludes the use of planned burning or fuel reduction techniques in areas intolerant to fire.

Figure 5: Fuel Management Zones

Using a hard copy map, define FMZs for the reserve. Once you have determined the zones on the hard copy map, transfer the information to the appropriate Fuel Management Zones table in MapInfo. Use the Conservation Management Planning MapInfo Workspace and edit the Fuel Management Zones table.

Figure 6: Example of Fuel Management Zones at Brown's Lane Reserve

4.3 Habitat Zones

Using the Habitat Zones determined during the Vegetation Quality Assessment (Habitat Hectares), transfer the zones and data to the Habitat Zones table in MapInfo.

5 Developing the CMP

Now that you have collected and collated all of that useful information, it's time to put together the Conservation Management Plan.

Using the Conservation Management Plan Template start to put the information you have collected into the document.

5.1 Site Overview

The Site Overview section provides background and introduction to the site. It discusses the environmental and landscape context of the site as well as presenting broad overview/background of the management of the bushland at the site to date.

Include a map of the reserve which shows the location of the reserve in relation to Nillumbik Shire Council's boundaries and includes aerial photography, property boundaries, reserve boundaries, contours and the location of waterways or wetlands.

5.2 Values and Assets

The Values and Assets section of the CMP allows you to describe and discuss the values and assets existing within the reserve or surrounding the reserve.

5.2.1 Vegetation

In this section you should provide a description of the extent quality and significance of the indigenous vegetation at the site, as well as discussing and describing the Ecological Vegetation Classes and providing a summary of the Vegetation Quality Assessment. You will need to complete Appendices A and D of the CMP Template.

The EVC Benchmarks may provide you with useful information in completing this section.

5.2.2 Fauna

In this section you should provide a description of the fauna occurring within or surrounding the reserve. You should discuss any significant species recorded within or near the reserve, levels of significance i.e. National, State, Regional, Local of particular species and any management requirements of the species.

You will need to complete Appendix B of the CMP Template.

5.2.3 Habitat Values

In this section you will need to provide a description of any particular habitat values of the site. Here you may discuss the presence or absence of Large Old Trees (LOTs), hollow bearing trees, logs or other habitat features.

5.3 Threatening processes

Describe and discuss the key threatening processes to the site and recommend management actions for each in relation to native vegetation management for the site. The

headings within the CMP are only given as an indication of the types of threats you may encounter, delete or modify to suit your particular needs.

5.3.1 Habitat destruction, modification and fragmentation

Describe and discuss issues relating to habitat destruction, modification or fragmentation within the reserve.

5.3.2 Pest plants

Describe and discuss distribution and density of weed species across the site. Complete Appendix C - Weed List. Discuss the negative or positive impacts of the weeds.

Using the data you collected during the Site Assessment, prepare and insert a map which shows the high threat weed species present within the reserve.

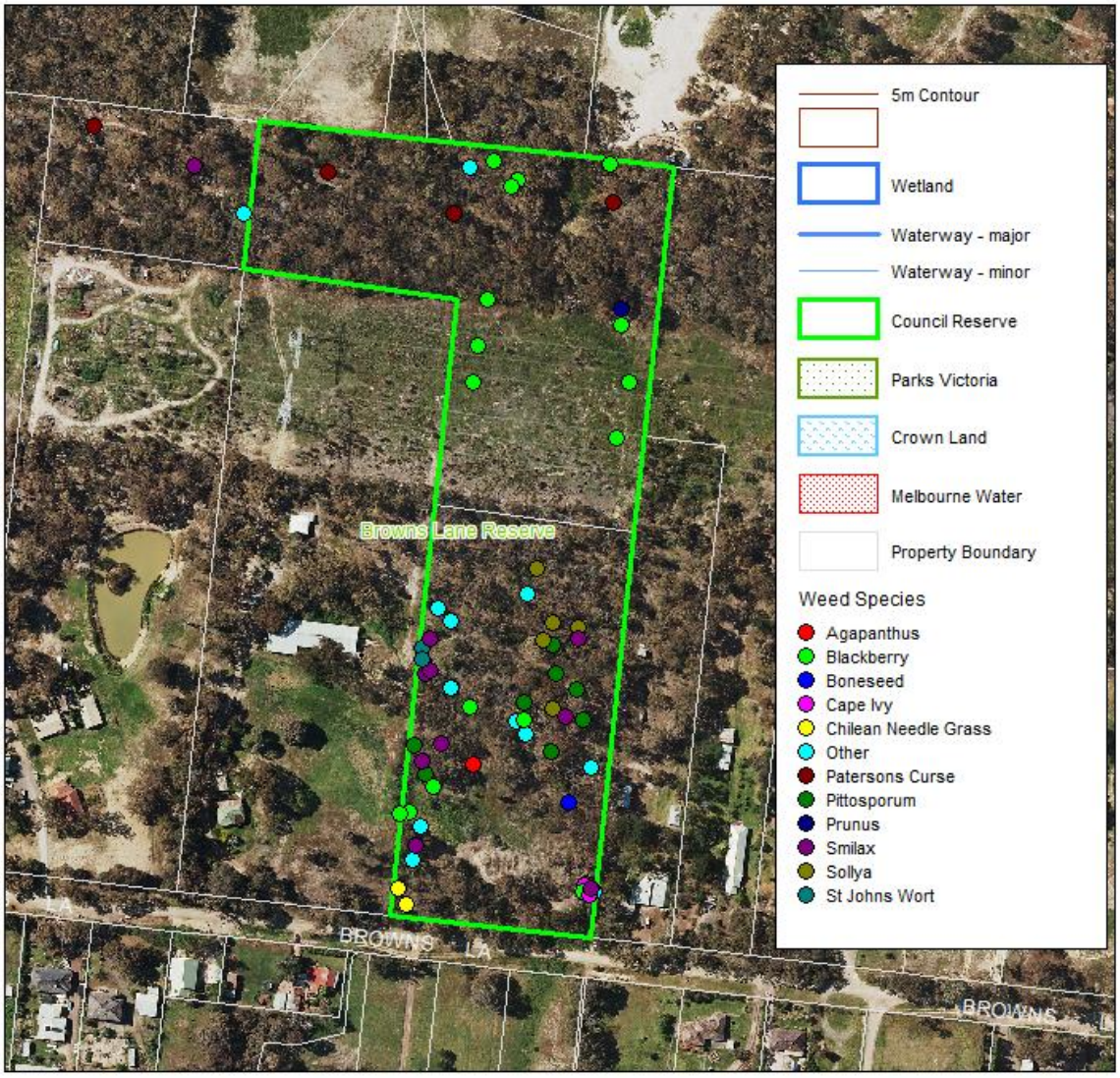

Figure 7: Example of a Weed Map at Brown's Lane Reserve

5.3.3 Pest animals

Describe pest animals known to occur on site including rabbits, foxes, feral pigs, feral cats etc. Describe potential densities and impact of animals on the site.

Using the data you collected during the Site Assessment, prepare and insert a map which shows the location of pest animal burrows, dens or harbour within the reserve.

5.3.4 Tree decline

Describe and discuss any issues relating to tree decline across the site.

5.3.5 Erosion and sediment control

Describe and discuss any issues relating to erosion and sediment control across the site.

5.3.6 Direct human impacts

Describe and discuss any issues relating to direct human impacts on the site. This may include rubbish, recreation, timber cutting, removal of firewood and debris.

If required, you may provide a map showing the locations of any issues that you mapped during the site assessment.

5.3.7 Drainage/stormwater

If applicable, describe and discuss any negative drainage or stormwater impacts the reserve might be experiencing.

Some sites may have Waterwatch monitoring data for them. This information can be found at: http://www.vic.waterwatch.org.au/monitoring-and-data/1065/.

To interpret the data there is a manual here: http://www.vic.waterwatch.org.au/monitoring-and-data/1011/

5.4 Altered fire regime

If applicable, describe and discuss the impacts of altered fire regime's on the reserve. Is the lack of fire affecting the vegetation communities and suitable habitat at the site?

What sort of fire regime would have been expected here? What species/species composition is it affecting?

You may wish to use the CFA's Fire Ecology Guidelines.

5.4.1 Altered browsing/grazing regime

If applicable, describe and discuss the impacts of altered browsing and grazing regimes on the reserve. What sort of grazing regime would have been expected here, e.g. small browsing mammals which now aren't present? What species/species composition is it affecting?

5.4.2 Altered water quality and flows

If applicable, describe and discuss the impacts of altered water quality and flows on the reserve. Is this area on the floodplain? What is the expected flood regime? How is drainage affecting the site?

5.5 Management Zones

In this section of the CMP you will be required to discuss and present the different Management Zones within the reserve.

5.5.1 Management Zones

Referring back to the Management Zones you mapped in Section 4 of this manual provide detailed descriptions on each of the Management Zones you have mapped. Include the following information:

- Name of the Zone
- Values/assets present in that zone
- Threats to the zone
- Management actions required for the zone

Prepare and insert a thematic map of the reserve which shows all of the Management Zones.

5.5.2 Fuel Management Zones

Referring back to the Fuel Management Zones that you mapped in Section 4 of this manual, you will need to describe and discuss each FMZ. You may wish to cover topics such as:

- Overall Fuel Hazard Assessment results
- Key fuel management issues i.e. bark, Kunzea etc.
- Assets potentially at risk i.e. nearby houses, LOTs, logs
- Areas to be exempt from burning
- Potential areas for ecological/prescribed burning.

Prepare and insert a thematic map of the reserve which shows the Fuel Management Zones, as well as the Overall Fuel Hazard Assessment results.

6 Works planning and reporting

A Works Plan is an Excel spreadsheet that turns a Conservation Management Plan and its goals into on-ground actions. The best works plans constantly evolve based on the outcome of works and change to the threatening process through a cycle of plan, do and review (Figure 2).

The Works Plan provides space to include the 5-year goals from the Conservation Management Plan, annual works for the current financial year and reporting of works done and final costs.

Develop a Works Plan for each reserve where works you are contracting works. Depending on the level of planning that has occurred for the reserve it may include a 5-year goals as well as annual actions and budgets. When a Works Plan precedes the Conservation Management Plan you can hide the goals section until you have developed them.

The following section provides a method for creating a Works Plan, recording works and reviewing the Works Plan.

6.1 Working with contractors

The system is designed to set up a conversation between land mangers (you) and environmental contractors. It helps you set goals for management, plan actions, allocate budgets and report to funding bodies. It allows contractors to understand their responsibilities, provide input into planning, share their knowledge of reserves, report on works and provide accurate invoicing. Collectively it allows land managers and contractors to record a history of a reserve and to share intentions and actions. See Figure 8 and Table 4.

When working with contractors provide them with the following resources (available in G:\Environmental_Works\Administration\Policies_Procedures\Environmental_Works_Toolkit):

- Contractor Reporting Procedure
- Works Plan with works plan, weed record and rabbit record worksheets (Excel spreadsheet)
- Weed and Rabbit Field recording sheets (if required)
- A template for recording details of weed control works and weed mapping in Apple Numbers format for collecting data in the field using an iPhone or an iPad (if required).
- Quick references for collecting weed and rabbit control and mapping data
- Reserve maps (if required)
- Existing weed/rabbit/threat mapping data (if available/required)

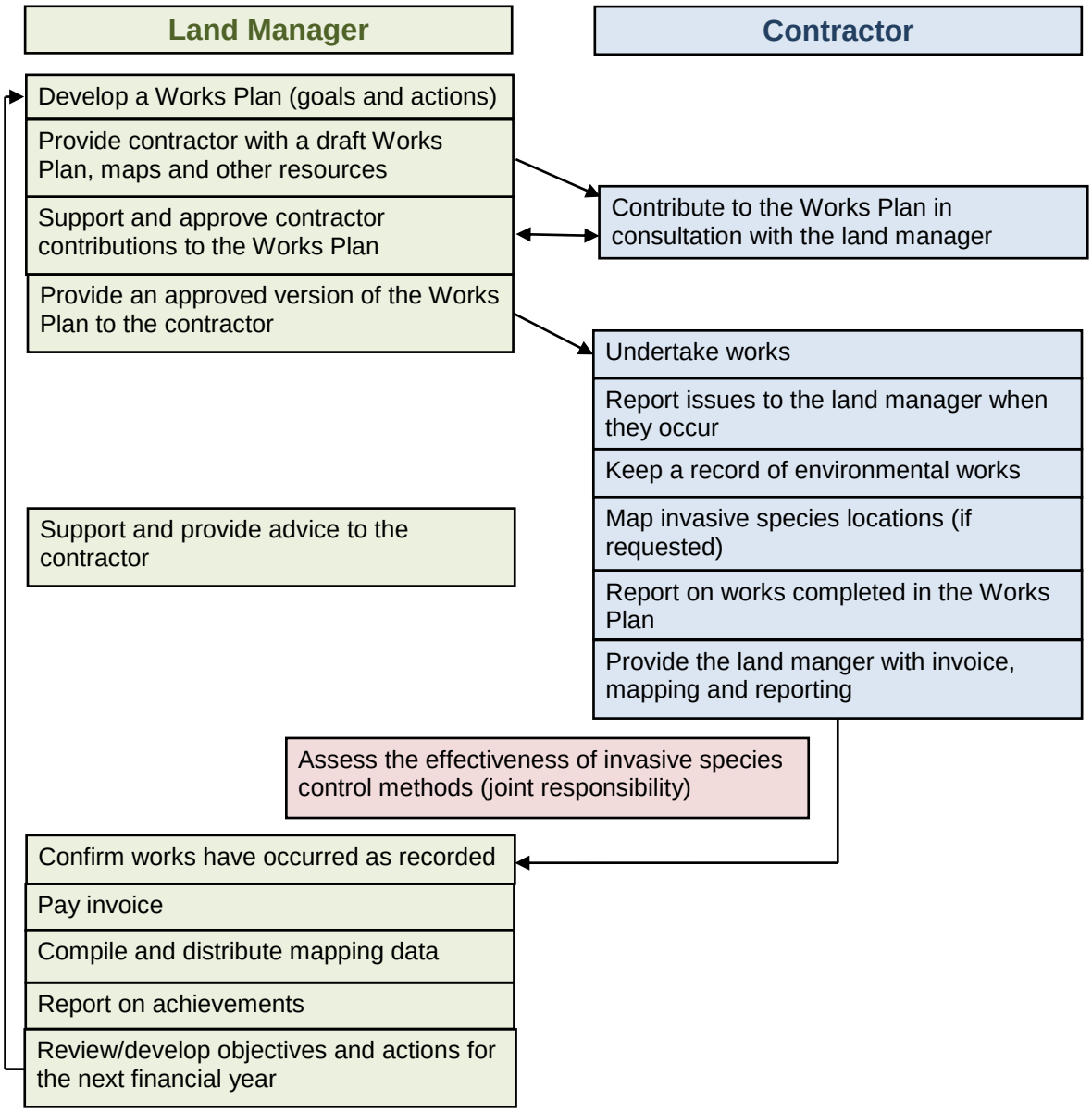

Figure 8: Works planning, mapping and reporting procedure for contractors

Table 4: Contractor data management requirements

Works Planning	1. Prior to starting on-ground works, work with the land manager to develop a Works Plan for the year. 2. Return the Works Plan to the land manager for approval. Note: You are authorised to start works once the land manager provides you with the approved Works Plan and a purchase order.
Implementation	3. Record and map weed and/or rabbit control and, when specified in the Works Plan, map locations of uncontrolled infestations. 4. Report against the Works Plan.
Invoicing and Reporting	5. With each invoice, send the land manager the most up-to-date Works Plan with a record of completed weed control works.
Final Reporting and Data Submission	6. With the final invoice for the current financial year's budget, send the land manager the completed Works Plan, any records of weed and rabbit control works/locations and all associated mapping data.

6.2 Develop a works plan

The Works Plan template and an example is located at G:\Environmental_Works\Administration\Policies_Procedures\Environmental_Works_Toolkit

Action

1. Set up a works plan for your reserve using the Excel template. Enter the name of the reserve in the title of the worksheet. You may choose to have separate works plans for different contractors or management zones within a site. See Section 6.5 for guidance on naming and managing Work Plan files.
2. List all the weeds and other threats you plan to manage and activities you plan to undertake. For each, complete sections 1 and 2 of the Work Plan template. See Figure 9 and Table 5 for details.
   Note: You can develop a works plan in stages by first planning actions for one year, and set a five year goal and actions for subsequent years as you improve your knowledge of the site.
3. Provide the Works Plan to the contractor and ask them to fill in section 3. Only provide the contractor with the actions for which they are responsible. Note: You can use the work plan in this way to get a quote from a contractor.
4. Review the contractors suggested changes and costs and make changes to the plan as appropriate. This may involve a discussion with the contractor.
5. Hide the Budget and Suggested changes columns (select the columns, right click the selected area and select Hide).
6. Raise a purchase order.
7. Enter the works in Rapid Asset.
8. Add the word approved and the work order number in the Works Plan file name and send the approved Works Plan back to the contractor so they can commence work.

Figure 9: Planning component of Works Plan

Section 1				Section 2			Section 3				Section 4	
				Year 1								Year 2
Works plan				Annual works plan			Contractor planning (cost and time works)				Actual Works	….
Works ID	Weed/ Threat/ Activity	Location	Five year goal	Action	Control Method/s	Budget ($ exGST)	Suggested changes to actions or control methods	Timing	Estimated hours	Estimated cost ($ exGST)	….	….

Table 5: Works Plan Details

Field	Details
Section 1: Overall Works Plan	
Works ID	Number your works so contractors can reference them when mapping. A simple way to number works is: [Asset ID or Reserve ID]-[sequential numbering – 001,002,003, etc.]
Weed/ Threat/ Activity	Weed species or other threatening process (e.g. rabbit control or erosion) you are going to manage, or activity you are going to undertake (e.g. revegetation or fencing). You can group together weeds that are controlled together (e.g. woody weeds or bulbous weeds) and have the same goals and actions. However, consider the type of information you want to collect. Two weed species may have the same control methods but may have different spread patterns or cause different environmental impacts.
Location	The specific location of works. Include for clarity and if not applicable or the goals and actions are for the whole site leave blank. Depending on your project and site characteristics, you might break up control of a specific weed by reserve, zones within a reserve, or by weed infestations. When deciding on the best scale to set goals and actions, consider the scale at which the area is managed and at which you require reporting. For most instances a budget will be set at a reserve scale and a single contractor will manage that reserve. If in doubt, keep the plan as simple as possible.
Five year goal	Goal for each weed, threat or activity. Although the column heading is five year goal, change this to suit your project and/or existing management plans. You can set multiple goals for a specific weed at a specific location within a single cell by pressing CTL+Enter to create a new line. Number multiple goals for clarity. See following for guidance on setting goals.
Section 2: Annual Works Plan - Complete for each year.	

Field	Details
Action	The action/s you plan to undertake for that weed, threat or activity in that year. For weed control, include treatment of weeds, mapping, weed surveillance, landholder engagement and management of threatening process causing weeds to establish and spread. You can set multiple actions for a specific weed at a specific location within a single cell by pressing CTL+Enter to create a new line. Number goals for clarity. See followingfor guidance on setting actions.
Control Method/s	The planned control method/s for the weed (e.g. cut and paint, drill and fill, hand pull, etc.). You may need different control methods for different age classes and/or for areas with more sensitive vegetation.
Budget	Hide the budget column If you haven't divided the budget by different weeds/threats or if you are asking for a quote. List the total budget next to the worksheet tile. To hide the column right click the column heading and select Hide.
Section 3: Contractor Planning – to allow contractors to make suggestions to the Works Plan and to cost and time actions.	
Suggested changes to actions or control methods	Space for contractor to suggest changes to the actions or the control methods. To hide the column right click the column heading and select Hide.
Timing	Space for contractor to plan the timing of the action/s (e.g. which season or months).
Estimated Time (hrs)	Space for contractor to estimate the number of man hours the action/s will take.
Estimated Cost ($ exGST)	Space for contractor to estimate the cost of the action/s.

When planning works consider any specific issues or risks arising from works and how they will be managed. For example, contractor safety, public safety (such as pine trees falling after being drilled and filled, birds or people eating sprayed blackberries), untested control methods, cultural heritage, damage to native vegetation, removal of habitat, weed reinvasion following removal, waterway pollution by herbicide runoff, *Phytophthora cinnamomi* infection, erosion and fire hazards.

If a control method has not been proven or there are specific risks (e.g. off-target damage), discuss with the contractor how the effectiveness of the control method will be assessed.

6.2.1 Setting Goals

Outcome based goals

When setting goals consider the level of service for your reserve (Reserves Prioritisation and Planning Guidelines) and the biosecurity approach. Set goals that are S.M.A.R.T (**S**pecific, **M**easurable, **A**chievable, **R**elevant and **T**ime-bound). Goals should reflect the outcomes you want to achieve. You may vary your goals from the level of service depending on the:

- natural values to be protected
- vegetation type
- slope
- level of threat
- current availability of resources ($, time)
- weed or pest animals ecology
- ease of control
- accessibility
- your ability to control external weed sources, pest animals and threatening processes

Make sure you have a good understanding of the ecology of a weed or pest animal before setting control goals.

Wording goals

The language used when setting goals is very important because they provide a benchmark to monitor the success of your project. Goals need to make it very clear what you intend to achieve and where. For weed control, use words such as Maintain, Eliminate, Reduce, Remove or Engage.

Maintain: For example: “maintain an area free of a weed species”. A maintain goal may apply to an area in which a weed has been removed (or is not yet present but likely to invade) and would involve actions such as surveillance for and treatment of all new infestations.

Eliminate: A nice way of saying kill. For example: “eliminate all isolated infestations”, “eliminate a particular infestation” or “eliminate all plants within a particular area”. Even if a weed is eliminated it is likely there will be a soil seed bank, a small number of remaining undetected plants and/or ongoing dispersal from outside the site. Thus, ongoing maintenance works will probably be required.

Reduce: A reduction in the cover of a weed, extent of a weed infestation or level of soil seed bank.

Remove: Use a remove goal to relate to the protection of a particular biodiversity asset. For example: “remove all plants from around a significant species” or for a climbing weed – “remove all aerial parts from native plants”.

Engage: For example: “Engage adjacent land holders to treat their infestations of a particular weed”.

Eradicate: Don’t use the word ‘eradicate’ unless dealing with a small infestation of a high threat new and emerging weed (such as a state controlled weed), as it is defined as complete and permanent removal of a weed. For most weeds even once all plants are eliminated, seeds or propagules will remain in the soil or will be able to enter the site from nearby populations.

Containment

How you contain a weed infestation will depend on the ecology of the weed and its current extent. If the level of service is to contain and/or prevent spread, the specific goals may include:

- Eliminate all plants within a defined distance of a biodiversity asset
- Eliminate isolated infestations
- Eliminate recruiting individuals
- Reduce the extent of a core infestation
- Prevent a core infestation from seeding (e.g. by quick spraying, slashing or deadheading)

6.2.2 Setting Actions

Input based actions

Unlike a goal which is outcome based, actions should be input based, relating to what you want done on or for the site. Outcomes are difficult to measure over a single year due to environmental variability and variable responses of weeds to control. Input-based actions make it clear what you want done, make it easier for contractors to cost works and can be measured in the short term.

Wording actions

Writing clear, unambiguous actions is important to provide a clear line of communication with contractors and allow you to assess if the action is completed. Use words like treat, systematically search, map and engage:

- **Treat:** Use the word 'treat' to represent any control activities – the specific method can be included in the control method column. Specify the lifeform and location – for example: "Treat all mature sweet pittosporum in the rehabilitation area".
- **Systematically search:** For example: "systematically search an area of a reserve and treat all infestations found". This builds surveillance into your action and gives you some certainty that areas are weed free.
- **Map:** Sometimes mapping is required to plan and prioritise future actions (see Section 3.4 and the Contractor Reporting Procedure).
- **Engage:** You may wish to specify how you want to engage a landholder, although as a different department or organisation than the land manger (you) often delivers programs available to assist landholders, you may wish to leave the action vague and provide details in the comments section at the end of the year.

Dividing up actions over the length of a project

- Consider the sequence of actions required to achieve your goals.
- Consider budget and resource availability.
- For revegetation consider:
  - Ordering plants
  - Preparing the site
  - Planting
  - Watering
  - Follow up weed control
  - Removing guards
- For weeds consider:
  - the ecology of the weed. For example: Boneseed's seed can remain viable in the soil for up to 10 years. It reaches maturity at 18-24 months, flowers in autumn, fruits in winter-spring and seeds are mostly dispersed locally. Therefore, a systematic

search and treatment of all plants every 2 years in autumn, when the plant is flowering, should reduce the seed bank to negligible levels within 10 years.
  - how the weeds will respond to other actions such as rabbit control, weed control or ecological and fuel reduction burns.
  - what plants may grow in the spaces created by treated weeds. Think about how you can stagger works or change control methods to prevent re-infestations of the treated weed or infestations by new weeds.
  - how weeds may spread if you don't do a particular action. Plan the actions first that protect a biodiversity asset or prevent a situation worsening.
  - that sometimes a big push in the early years, particularly if there are lots of mature seeding plants, can allow you to get ahead of a weed.
  - that in more degraded areas staggered removal of weeds is often desirable to allow natural regeneration of native species. Staggered removal may also be appropriate in more intact areas to make sure you don't impact too heavily on fauna populations that might be using weeds for habitat.
  - that it may take treatment of the same area over several years to exhaust a seed bank – consider the length of time seed remains viable in the soil.
  - Even once you reach your goal you will probably still need to systematically search for and treat new infestations and emerging seedlings.
- Build flexibility into your actions considering unexpected weather conditions, weed growth or wildfire.

6.3 Report actions (end of the financial year)

Keeping a good record of actual works completed allows you to develop a site history and cost and plan future works. This information is also very useful when reporting to funding agencies.

Action

1. At the end of each year ask the contractor to complete section 4 of the Works Plan (as per Figure 10 and Table 6) and return it to you.
2. If you have works from several contractors and/or works completed in-house compile the separate Works Plans/reporting into one document.

Figure 10: Reporting component of the Works Plan

Section 4

Year 1					
Actual Works					
Progress	**Comments**	**Suggested follow-up works**	**Actual hours**	**Actual Cost ($ exGST)**	**Invoice number/s**

Table 6: Details of the reporting component of the Works Plan

Field	Details
Section 4: Actual works – to allow contractors to report on works completed. Also allows the land manager (you) to report on actions completed in-house.	
Progress	Contractor progress towards completing the action selected from a dropdown menu including: Not started; In progress; Partially completed action; Completed action; Exceeded action. In progress should only be included in interim reporting.
Comments	Contractor comments. Particularly if the action wasn't fully completed or was exceeded.
Suggested follow-up works	Contractor suggestions for works in the following years. Use the responses in this section when planning future works.
Actual Hours	Contractor to enter the number of man hours the action took.
Actual Cost ($ exGST)	Contractor to enter the actual cost of completing the works – as reflected in the their invoicing.
Invoice number/s	Contractor to enter invoice number of works Use this section to reconcile accounts.

6.4 Review the plan (end of financial year)

An important step in planning weed management is checking back with your works plan to see how far you've progressed and how you can adapt and improve the plan for future weed management. The continuous cycle of; plan, do, review (see Figure 2: Plan, Do and Review) will not only enable you to carry out considered and strategic weed management, but allow you to adapt to changing environmental conditions and budgets, respond to emerging issues and improve your management over time.

Action

1. Review the plan each year based on the actions achieved and changes in weed and pest animal presence, priorities, threats, cover and abundance. Use the suggested follow up and comments responses provided by the contractor. Always reflect back to your five year goals to determine what steps you need to take to achieve them.

6.5 File management of Works Plans

The following section provides guidance to naming and working with Work Plan files to prevent confusion or data loss.

Master works plan: Create a single master Works Plan for each reserve (or project if appropriate). Include the name of the reserve or project). At the end of the financial year copy all changes and additions into this file. Also, make changes to future years actions in this file when reviewing the plan.

Naming convention: WP_Master_[Reserve name(or project name)]

Contractor works plans: From the master Works Plan, create a version to give to each contractor working on the site (you may only have one). Remove all actions that are not

the responsibility of that contractor. Delete or hide all columns in subsequent years except the action and control method columns (decide if you want to disclose future budgets). Include the year and a short description in the title of the works plan to make the version clear.

Naming convention: WP_ [Reserve name(or project name)]_[Year (eg.12-13)]_[Work order number]_[Short description/contractor name to distinguish between different plans]_Proposed

And once the Works Plan is approved, change the word proposed to approved.

Quote requests: You can use the works plan format to request a quote from a contractor. Create a version of the Works Plan (from the master works plan if available) which only contains the actions you want quoted.

Include the words quote request in the title of the works plan.

Naming convention: WP_Quote Request_[Reserve name(or project name)]_[Year (eg.12-13)]_Short description/contractor name to distinguish between different plans]

Appendix A - VQA Field Sheet

Vegetation Quality Field Assessment Sheet

Version 1.3 - October 2004

Department of Sustainability and Environment

Site Name/No. ..... Location ..... Date .....

Assessor(s) ..... Map Name/No. ..... AMG / MGA .....

Tenure ..... EVC ..... Bioregion .....

'Site Condition Score'

Large Trees *Score* ☐

Category & Description	% Canopy Health*		
	> 70%	30-70%	< 30%
None present	0	0	0
> 0 to 20% of the benchmark number of large trees/ha	3	2	1
> 20% to 40% of the benchmark number of large trees/ha	4	3	2
> 40% to 70% of the benchmark number of large trees/ha	6	5	4
> 70% to 100% of the benchmark number of large trees/ha	8	7	6
≥ the benchmark number of large trees/ha	10	9	8

Large trees are defined by diameter at breast height (dbh) - see EVC benchmark.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Tree Canopy Cover *Score* ☐

Category & Description	% Canopy Health *		
	> 70%	30-70%	< 30%
< 10% of benchmark cover	0	0	0
< 50% or > 150% of benchmark cover	3	2	1
≥ 50% or ≤ 150% of benchmark cover	5	4	3

Tree canopy is defined as those canopy tree species reaching ≥ 80% of mature height - see EVC benchmark description.

* Estimate proportion of an expected healthy canopy cover that is present (i.e. not missing due to tree death or decline, or mistletoe infestation).

Lack of Weeds *Score* ☐

Category & Description	'high threat' weeds*		
	None	≤ 50%	> 50%
> 50% cover of weeds	4	2	0
25 - 50% cover of weeds	7	6	4
5 - 25% cover of weeds	11	9	7
< 5% cover of weeds**	15	13	11

* proportion of weed cover due to 'high threat' weeds - see EVC benchmark for guide.

'High threat' weed species are defined as those introduced species (including non-indigenous 'natives') with the ability to out-compete and substantially reduce one or more indigenous life forms in the longer term assuming on-going current site characteristics and disturbance regime.

The EVC benchmark lists typical weed species for the EVC in the bioregion and provides an estimate of their 'invasiveness' and 'impact'. In general, those weed species considered to have a *high impact* are considered *high threat* regardless of their invasiveness.

** if total weed cover is negligible (<1%) and high threat weed species are present then score '13'.

Understorey Life forms

LF Code from EVC benchmark	# spp observed / Benchmark spp.	% cover observed / Benchmark % cover	Present (✓)	Modified (✓)
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		
	/	/		

Present

For life forms with benchmark cover of < 10%, considered 'present' if
- any specimens are observed.

For life forms with benchmark cover of ≥ 10%, considered 'present' if
- the life form occupies at least 10% of benchmark cover.

Modified (apply only where life form is 'present')

For life forms with benchmark cover of <10%, then considered substantially 'modified' if the life form has either:
- < 50% of the benchmark species diversity; or
- no reproductively-mature specimens are observed.

For life forms with benchmark cover of ≥ 10%, then considered substantially 'modified' if the life form has either:
- < 50% of benchmark cover; or
- < 50% of benchmark species diversity; or
- ≥ 50% of benchmark cover due largely to immature canopy specimens but the cover of reproductively-mature specimens is < 10% of the benchmark cover.

Understorey *Score* ☐

Category & Description		
All strata and Life forms effectively absent		0
Up to 50% of life forms present		5
≥ 50% to 90% of Life forms present	• of those present, ≥ 50% substantially modified	10
	• of those present, < 50% substantially modified	15
≥ 90% of Life forms present	• of those present, ≥ 50% substantially modified	15
	• of those present, < 50% substantially modified	20
	• of those present, none substantially modified	25

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