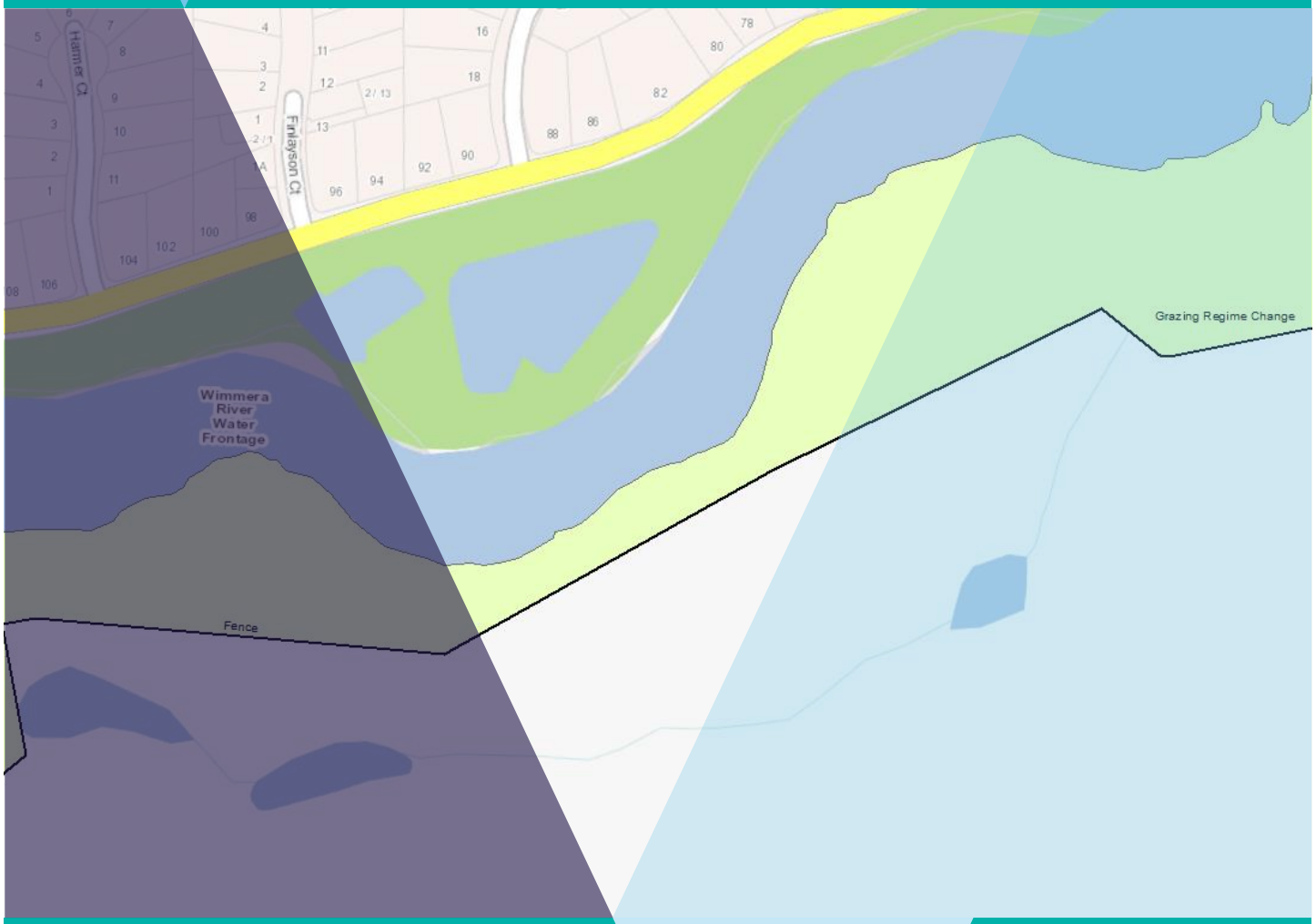
Spatial Output Reporting Guideline

A Guide for Natural Resource Managers



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VICTORIA State Government
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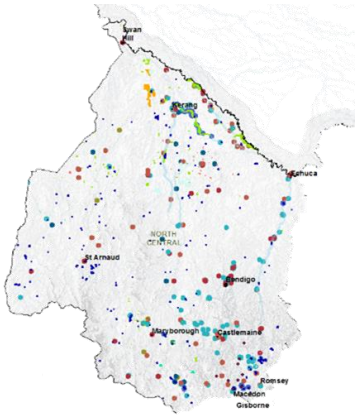
1. Introduction

1.1 What is the purpose of this document?

This document has been developed to help natural resource managers who have the responsibility to collect or manage output data provide high quality data to the Department of Environment, Land, Water and Planning (DELWP). The guidance applies to Version 2.0 of the DELWP Output Data Standards, dated June 2015.



The guidance has been organised using a set of questions that users may have. While the Output Data Standards provide some detail, there are many areas of ambiguity, where differing interpretations can be made. This guideline tries to identify those areas and provide a single solution where multiple solutions are sometimes possible.

The Guide will be periodically updated; acknowledging that over time, as new uses of the output data are found, some tweaking may be required.

Guidance in this document is also focussed on achieving a greater level of consistency in the data provided to ensure that collectively we can maximise the potential of the data for reporting purposes. DELWP have found that small differences in interpretation of the Standards can lead to large differences in the data provided.

1.2 What are outputs and why do we collect the data?

The Output Data Standards were developed by DELWP in 2012 to help account for the significant annual investment made by DELWP, and other stakeholders. Since then, the Standards have become embedded in activity planning, implementation and reporting for the ten Victorian Catchment Management Authorities (CMAs).

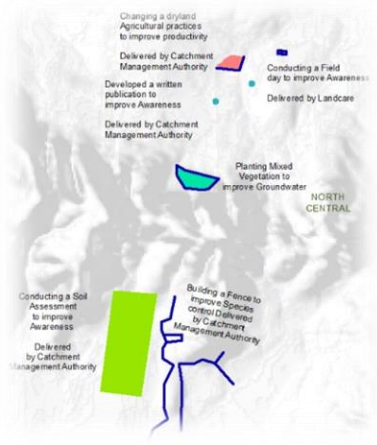
CMAs capture outputs from their investment and effort right across the sector including DELWP programs, Australian Government programs and the efforts of community groups.

It is also expected that over time the use of the Standards will be adopted by other agencies and programs across the sector.

The Standards describe the minimum information requirements for reporting on the most common goods and services (i.e. outputs) that the department purchases through its range of investment programs.

Specifically, the Standards provide:

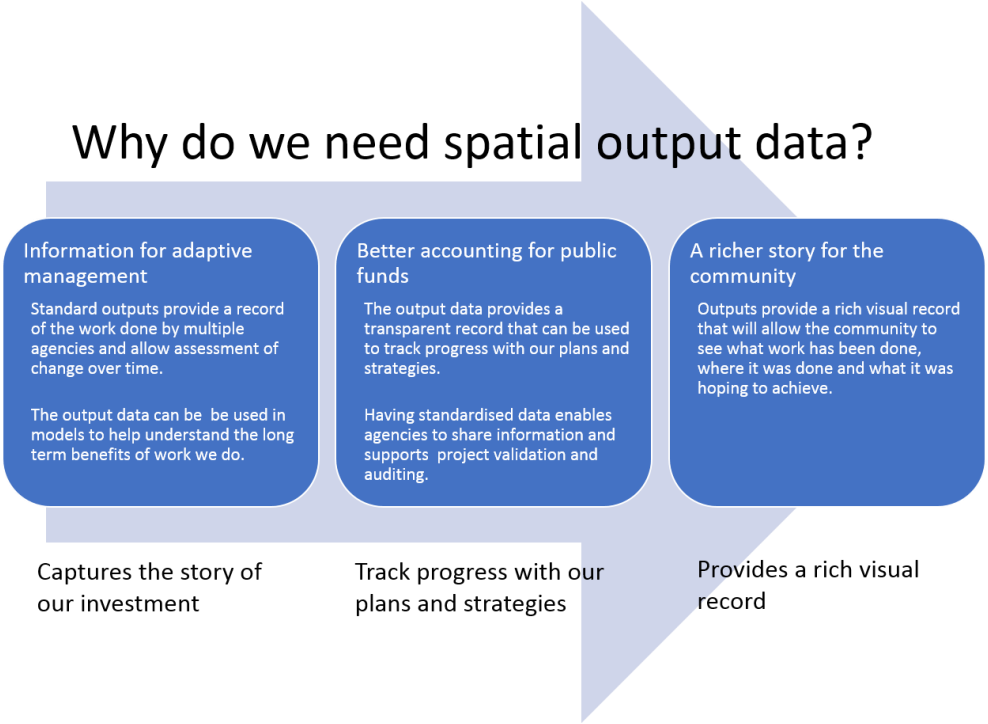
- a range of standard descriptors for the outputs from investment
- clarity on the requirements for reporting on investment outputs
- the basis for consistent data, systems and reporting on investment outputs.



Output data can be used to support adaptive management by providing a record of the work done by multiple agencies and allow monitoring of change over time. The data can also be used in models to help predict the long-term benefits of work we do.

Critically, the output data provides a transparent record that can be used to track progress with our plans and strategies, and the standardised data enables agencies to share information and support project validation and auditing.

Output data provides a rich visual record that will allow the community to see what work has been done, where it was done and what it was hoping to achieve.



1.3 What are the CMA responsibilities to provide data?

The newly agreed Statement of Obligations (SoO) for Catchment Management Authorities (2018) requires the authorities to provide output data that represents the most common goods and services funded by the Victorian Government.

The SoO states that CMAs:

> '… shall provide output data to the Department for Victorian Government funded on-ground works completed as part of its operations. The data must conform to the Department's Output Data Standards, or any other standard or guideline issued by the Department.'

This is a new obligation in the SoO and reflects the fact that the Output Data Standards have become central to how CMAs manage their information.

CMAs are also required to provide data in accordance the requirements of the Victorian Water Programs Investment Framework (VWPIF) Funding Agreement between DELWP and CMAs.

1.4 What has changed from the last version of this document?

Since this is the first version of this Technical Guidance document, there are no changes in this version of the guidance document to earlier versions.

2. How do I prepare and submit output data to DELWP?

This section provides general details on the process by which output data is prepared and submitted to DELWP on an annual basis.

2.1 What outputs do I record?

As a general practice, works or activities undertaken under State and Federal Government funded programs are documented using a standard set of output descriptors. A full list of these Standards, as documented in the current version of the DELWP Output Data Standards, Version 2.0, is provided in Appendix 1.

Examples of the outputs typically used for major programs are identified in Table 2, in Section 3 of this document.

Outputs may also be recorded for other programs, including work by voluntary organisations or individuals. However, at this stage, these are not required to be reported to DELWP.

2.2 In what format should the data be stored and provided?

CMAs use a wide variety of software systems for their financial and project management systems and for their spatial information systems (GIS) and field data capture systems. The output Standards provide an important core around which standardised data collection and representation can occur. One of the benefits of the Standards are that they are system agnostic. Importantly, collection and reporting of the data should not be dependent on a specific software or a specific system arrangement.

DELWP's preference is for output data to be provided in an ESRI Geodatabase

To assist with reporting in accordance with the output Standards, DELWP has developed and provides an ESRI Geodatabase template version of the Standards. The Geodatabase template identifies a number of fields that require numeric coded values. However, non-coded values are also acceptable if they are compliant with the Standards. DELWP's preference is for coded values consistent with the Geodatabase template or non- coded values within a Geodatabase with long form field names.

We recognise that not all CMAs have the capacity to provide the Geodatabase with coded values. For this reason, we offer some flexibility, but acknowledge that inconsistencies in the data mean that there is more work to be done in preparation of data products that integrate data from across the CMAs.

A copy of the Geodatabase template is available from the DELWP on-line resources page for Output Data Standards. (See Section 7. 'Where can I get help?' section of this document)

2.3 When do we provide output data to DELWP?

CMAs are required to provide output data to Victorian Water Program Investment Framework programs within 45 days of the end of the financial year (30 June). Provision of data in accordance with the Standards is covered by a Funding Agreement between DELWP and CMAs that covers the provision of selected information relating to expenditure and outputs achieved.

Output data is also used to fulfil reporting requirements to the Federal Government, which is generally required by 1 August.

Summary information derived from output data is also provided for internal Corporate Governance reporting. This information is also presented in the annual Actions and Achievements Report prepared by CMAs.

2.4 What is the process for providing output data to DELWP?

The process for CMAs in providing output data requested by DELWP, involves the following steps**:**

- CMAs prepare or extract a version of the output data from their current spatial or information management systems.
- The data is checked for compliance with the Output Data Standards to ensure that:
    - Field names are consistent with the Geodatabase template or the Standards.

    - All attribute values are consistent with the Standards.
    - All attributes are provided – there are no gaps or invalid values.
    - Spatial objects are consistent with the Standards.
- The responsible officer in the CMA emails the data to the Water and Catchments Group Investment mailbox.

The process DELWP undertakes after receiving your CMA output data involves:

- DELWP undertakes a series of quality assurance processes to review the spatial and attribute integrity of the data provided.
- DELWP requests the resupply or clarification on the data supplied prior to acceptance of the data.
- A process of feedback continues between DELWP and CMAs until the data satisfactorily meets the required standard.
- DELWP makes the data available to help support future decision making.

3. How do I apply the Standards in Program Delivery?

This section provides some guidance on how to apply the Output Data Standards in the delivery of current environmental programs. In addition to identifying the recommended outputs to be applied in environmental program delivery, a set of case studies are presented that outline the how CMAs are currently incorporating the Standards into the delivery of four programs (see Attachments C to F).

3.1 Which Environmental Programs should I record output data for?

Current environmental programs for which output data is used to identify and record works undertaken include:

- Landcare
- Victorian Water Programs Investment Framework (VWPIF) programs (see
- Environmental Water
- Sustainable Irrigation Program (SIP)
- Our Catchments Our Communities (OCOC)
- National Landcare Program (Federal)
- State Biodiversity
- Biodiversity on Ground (BOG)
- Threatened Species Protection Initiative (TSPI)
- Victorian Environmental Partnerships Program (VEPP)
- Gippsland Lakes Coordination Committee
- Murray Darling Basin Programs (northern CMAs)
- Port Phillip Project Bay Environment Management Plan (protecting the Bay)
- Natural Disaster Relief Recovery Assistance (NDRRA) (Federal)

A list of the funding source codes associated with these Environmental Programs to be used in the submission of output data is provided in Appendix B.

3.2 When should you use an Output?

An output should be reported where an activity is finalised and is directly attributed to monies and resources expended or invested through a funding agency. All outputs within a single financial year should be reported together.

For some outputs, particularly 3.1 Grazing and 3.2 Agricultural Practice, it is important that they represent a specific item that an investor is paying for, and that they are not used to represent an outcome from another output. Changed agricultural practices, for instance, could be an outcome from fencing or management plans. The purpose of the output is to provide an opportunity to identify a small range of activities where we invest in direct interventions.

3.3 Which outputs should I record for individual investment programs?

The outputs typically used in recording works undertaken for the environmental programs identified are presented in Table 1. The table identifies those outputs that are ‘often’ used, ‘sometimes’ used, and ‘rarely’ used based on ‘best practice’ in relation to each of these programs. It’s worth checking this table to see if the outputs you are reporting represent common practice.

Table 1 List of outputs expected to be used in recording works undertaken for current environmental programs

	Program	Waterway Health	Environmental Water	Sustainable Irrigation Program	Our Catchments Our Communities	National Landcare Program	State Biodiversity	Gippsland Lakes Coordination Committee	Murray Darling Basin Programs	Port Phillip Bay Environment Management Plan*	Flood recovery (NDRRA)
Output Type											
1	**Structural works**										
1.1	Channel	S		O					O		S
1.2	Water storage	S		O					O		
1.3	Pump	S		O							
1.4	Irrigation infrastructure			O							
1.5	Waterway structure	S			O	O	O	O	O		O
1.6	Terrestrial structure										
1.7	Terrestrial feature										
1.8	Monitoring structure	S			O	O	O	O			
1.9	Fence	O			O	O	O	O			O
1.10	Visitor facility				O						
1.11	Road				S						S
1.12	Crossing										S
2	**Environmental works**										
2.1	Vegetation	O			O	O	O	O			O
2.2	Weed control	O			O	O	O	O			
2.3	Pest animal control	S			O	O	O	O			
2.4	Over-abundant wildlife control										
2.5	Threatened species response	S			S	S	S	S			
2.6	Emergency species response										
2.7	Soil treatment					S					
2.8	Earth works	S									O
2.9	Rubbish removal	S									S
3	**Management services**										
3.1	Grazing	S			S	S	S	S			
3.2	Agricultural practice				O	S					
3.3	Water		O		R				O		
3.4	Fire				R						
4	**Planning and regulation**										
4.1	Approval and advice	S		O	S	S	S	S			S
4.2	Management agreement	O			O	S	S	S			
4.3	Assessment	O	S	O	S	S	S	S	O		
4.4	Engagement event	O	O	O	O	S	S	S	O		
4.5	Partnership	S		O	O	S	S	S	O		
4.6	Plan	S	O	O	O	S	S	S			
4.7	Publication	S	S	S	S						
4.8	Information management system	R	R		R	R	R	R			

Codes refer to frequency of use based on Best Practice: O – Often, S – Sometimes, R – Rarely

3.4 What are some practical example of using the Standards in Program Delivery?

Practical examples that represent ‘best practice’ in the application of the DELWP Output Data Standard when reporting on environmental works are provided in Appendix C to F of this document.

These four case studies present examples of the general approach and workflow used when applying the DELWP Output Data Standards, including the sequence of activities.

The case studies in how CMAs are using the Standards in Program Delivery have been provided by the North Central and West Gippsland CMAs.

What are some practical approaches when reporting on…

Environmental Water Program works - that trigger fish breeding, boost vegetation, improve water quality and provide habitat for birds and animals. (See Case Study 1, Appendix C)	
Landcare Program works - that protect, enhance, and restore our natural environment, and improve agricultural productivity in partnership with landholders, Landcare groups, and the wider community. (See Case Study 2, Appendix D)	
Sustainable Irrigation Program works - that reduce adverse impacts of irrigation whilst improving water use efficiency and best practice in environmental and agricultural outcomes. (See Case Study 3, Appendix E)	
Waterway Health Program works - that support river health, provide more recreational opportunities, improves the habitat for native plants and animals, and offers cleaner drinking water supplies. (See Case Study 4, Appendix F)	

Figure 1 Some practical approaches to reporting.

4. What are the most common issues with output reporting?

4.1 What have we learnt from the data you provided previously?

This section provides advice on the treatment of common issues observed in applying the DELWP Output Data Standards and provision of output data.

General advice is provided in relation to issues observed in previous years, with detailed guidance provided in relation to issues where it is viewed warranted.

The key to our ability to use the output data to help tell some important stories about the work of our sector is consistency in the data provided. And consistency is important within the spatial elements of the data, the lines, points and polygons; and the tabular data, the field names and attribute values.

When data has been provided to DELWP, the Waterway Investment Program have spent additional and considerable effort in quality checking and re-formatting the data to reflect the Standards. While each year the data has been getting better, the data still needs substantial work to develop a state-wide database.

The table below provides a summary of advice provided in previous years to help avoid common errors.

Table 2 Some general advice provided in previous years to help improve the data provided

Common issues with data in previous years include:	Our Advice
Standard fund source code, as identified in PIRS, are not used.	Standard fund source codes, as identified in PIRS, and as outlined in Appendix B, must be used.
Custom or parallel domain based geodatabase systems – some CMAs create their own domains, using slightly different names, that replicate standard domains.	Domains should be consistent with the ESRI Geodatabase template. However, if these numeric domains are not used, attribute values must be consistent with the Standards.
Multiple spatial references when reporting; some data is provided in MGA54 and MGA55.	Data must be provided in Vicgrid94; EPSG:3111
Use of non-ascii characters in attributes – for example, leading hyphens in values.	We can't overemphasise that the ability to use summary information from the data provided is dependent on consistent data in the attributes.
Truncated field names when reporting with shapefiles.	In cases where shapefiles are the only option, to help us, a translation table showing how the truncated shapefile fieldnames relate to the Standards must also be provided.
Use of non-standard formatting in content. Common attributes impacted are: Year Completed, Fund source and Project ID.	We can't overemphasise that the ability to use summary information from the data provided is dependent on consistent data in the attributes.
Use of non-standard content in common attributes.	
Not populating some common attributes.	The usefulness of the output data is maximised when the data is complete. Data gaps, especially whole attributes, can limit the utility of the whole state-wide data.
Use of multiple attributes for single categories (i.e. fundsource1, fundsource2)	Please do not provide additional data. Data that is not required in the Standards may require additional work in quality checking and limits the capacity to automate some common procedures.
Delivery of multi-point features.	Multi-point features are not supported. Consistency with spatial elements of the data Standards is critical to our capacity to integrate data sets from across CMAs and other agencies.
Some outputs have the incorrect date.	Outputs should only be recorded for the year in which associated works are completed. Additional advice in relation to this issue is provided in the next section.

Additional guidance concerning several common issues that apply to a number of individual outputs are provided in the remainder of this section. These commonly observed issues in relation to application of the Standards include:

- What is the correct date for an individual output to be reported?
- Can a Project ID have more than one output in more than one year?
- Treated verses controlled extent
- Spatial representation of non-physical activities
- Use and access to Target Species list

4.2 What is the correct date for an individual output to be reported?

Outputs should only be recorded for the year in which associated works are completed. There are no exceptions. This is to avoid double counting or duplication. Outputs should be reported for the year identified in the 'Year Completed' field, where 1617 refers to works completed in the 2016/2017 Financial Year.

It is noted that a common mistake is to identify the output or the 'Year Completed' to be the year the works are funded, rather than the year they were completed. It is anticipated that a level of reconciliation will occur at the end of the financial year to ensure works undertaken are reflected in the expenditure reporting for a financial year.

4.3 Can a Project ID have more than one output in more than one year?

The one Project ID may be used to relate different output types completed in relation to the one project. For example, in one-year Fencing (1.9 Fence), or Weed control (2.2), may be used, while in a second year, revegetation (2.1 Vegetation), and additional weed control (2.2), may be undertaken. In this situation, four outputs, two recorded for each year, are used in relation to the one project, each with the same Project ID.

In the case of a baiting program (2.3 Pest Animal Control), where the baiting station is revisited, and baiting reapplied each year over several years, it is appropriate to provide a separate output (for 2.3 Pest Animal Control) for each year active treatment was undertaken for the spatial extent identified.

4.4 What's the difference between treated verses controlled extent?

Many of the outputs identified under the Environmental Works section of the DELWP Output Data Standards require the identification of the 'Treated' or 'Treatment area' attribute as either an area or as a percentage of the total 'controlled', 'gross area', or as defined by the 'Spatial object'. This spatial object may be a polygon feature, as in the case of 2.2 Weed control output, or a point feature, as in the case of 2.6 Emergency species response output.

An explanation of these terms and their interpretation in applying the Standards is provided here.

The term 'controlled' area is the 'gross area' over which works are effectively performed or looked over for a particular threat. This may be a property or paddock, or section of these, or it may be a section of a river reach or wetland. It is often the area identified in contracts that depict or define the area over which works are to be performed. The area controlled is the area that the spatial object should represent.

The term 'treated' is a sub-unit of the 'controlled' area for which particular treatments such as the spraying of targeted weeds were undertaken. Hence, 'treated' will be smaller than, and expressed as a portion, or percentage of, the 'controlled' area. The area treated is a specific attribute of the output and should be represented as a text description, not a spatial object.

In summary, for weed control the controlled area can also be thought of as the area over which contractors are required to walk and look over or around for the threat of weeds, whether they are spraying or not. The treated area is the percentage of the controlled area they actually spay (or treat).

Figure 2 provides a sketch showing the relationship between the 'controlled' or gross area for which treatments, such as the spraying of targeted weeds, are performed, and the area identified by use of the term 'treated'.

The figure on the left shows how the 'controlled' area should be a fair depiction of the area over which works are performed, whereas the depiction of the 'controlled' area on the right shows a large area to the bottom that is realistically outside the area of effective control. A pragmatic approach must be applied to estimating

the polygon size for the spatial object. DELWP will provide feedback to CMAs in cases where the spatial object for controlled is unrealistic for the area treated.

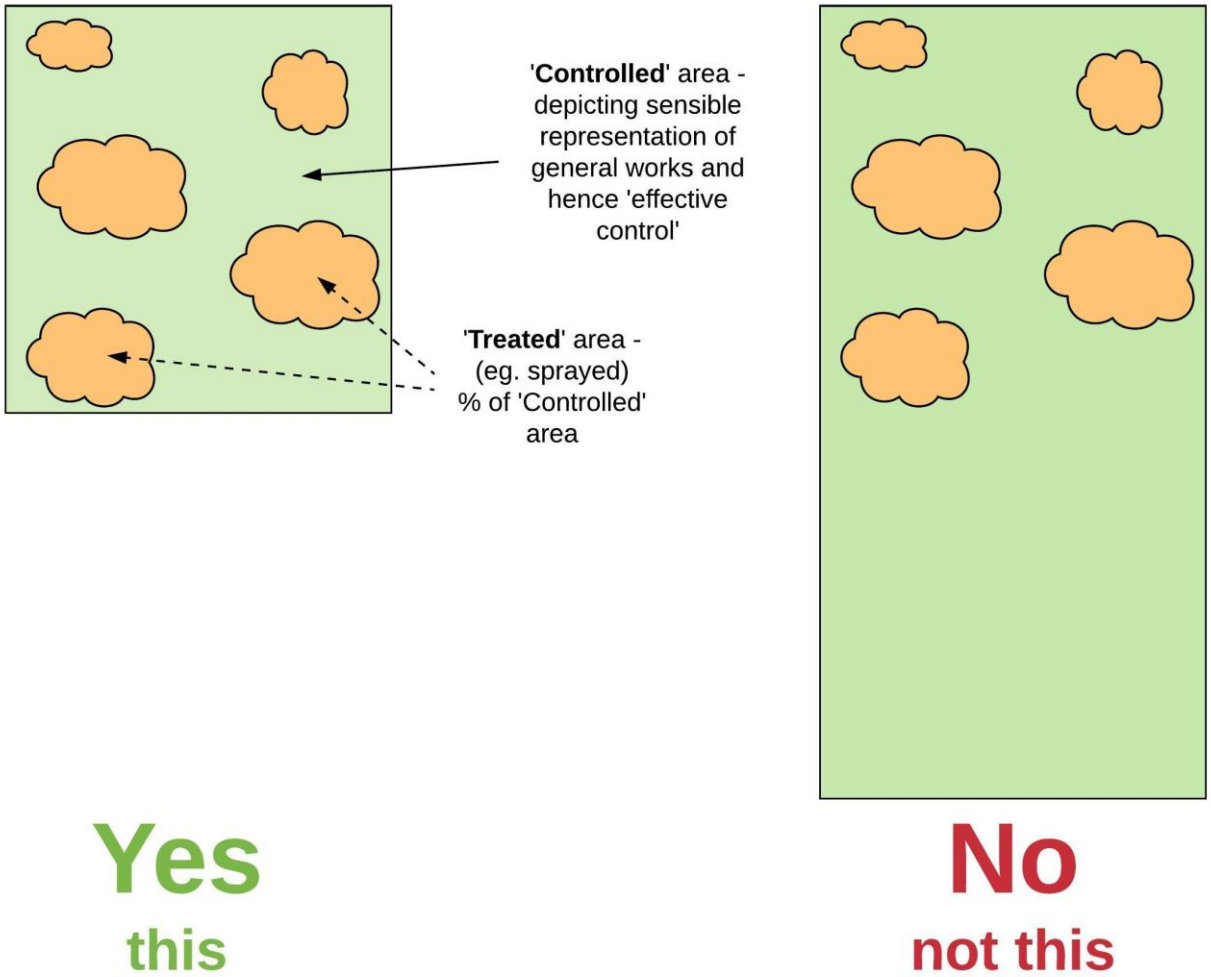


Figure 2 Sketch showing the area identified by use of the term 'treated', which is defined as a sub-unit of the 'controlled' or gross area for which treatments, such as the spraying of targeted weeds, are effectively performed.

4.5 How do I avoid large polygons?

Non-physical outputs such as Management Services and Planning and Regulation must be represented as spatial objects. However, the following rules should be applied to avoid large polygons that cover a whole region and obscure other works:

- Where a plan relates to an individual property, or collection of properties or a wetland, a polygon describing the area to which the plan relates is appropriate.
- Where the output relates to an area that is less than a quarter of a CMA (for example, a sub-catchment or smaller) a polygon must be used.
- Where a plan or strategy relates to the CMA as a whole, the point location for the CMA head office should be used.

4.6 What if my Engagement Event is not at my project site?

Where an Engagement event (4.4) is held at an office location, instead of on-site for convenience, the location of where the engagement event was held should be recorded. The' Name/Title' attribute should be used to identify the location to which the event relates where viewed to be of value.

4.7 Where do I find the Target Species list?

The Target Species attribute is required in many outputs, including those in the Structural Works, Environmental Works, and Planning and regulation areas.

For Target species details, users are required to use the species ID from the Victorian Biodiversity Atlas. The full list of species can be obtained from:

https://vba.dse.vic.gov.au/vba/index.jsp

Select under the 'Search' tab the 'Download species checklist' to obtain a copy in csv file format.

4.7 Grazing output – outputs are not outcomes

The Grazing (3.1) output should only be reported when we specifically invest in stock management. It should not be reported when grazing regime is changed due to investment in other outputs, such as fencing or a management plan.

Outputs that represent the benefits/outcomes of the investment, but have no specific investment activities associated, must not be reported. Outcomes however, can be identified in the 'Planned management outcome' common attribute for the output where they reflect the key management outcome of the works undertaken.

4.8 Only one funding source per output

In many cases, a single project may include the use of multiple fund sources.

For example, a waterway project may deliver 5km of fence. 2.5 km of the fence is funded by the RRAP and 2.5 km of the fence is funded by On-Ground Works.

The output data provided to DELWP for such a project must have two unique records - one that identifies that half of the fence was funded by the RRAP, and the other that identifies half was funded by On-Ground Works.

5. Guidance concerning Common Output Attributes

This section provides guidance concerning known issues and advice in their treatment in relation to common attributes.

Table 3 Description of common attribute data required for each output.

Attribute	Current Description	Source	Guidance Note
Output ID	Unique identifier for each output delivered. The Output ID should be composed of a two-to-six letter agency code (e.g. PV, NECMA, TFN, etc), followed by a unique number, e.g. EGCMA000001. Where an output is composed of more than one spatial feature, the Output ID applies to both spatial features. The sequence of these IDs is unimportant; however, it is crucial that each ID is unique to the output.	Provided by delivery agent as part of output reporting	CMAs should prefix with their CMA (ie. WGCMA) in ID, followed by a number they use, or a unique number they generate.
Output Data Standards	1.1, 1.2, etc This version is v2.0	See Output Data Standards	None
Output title	Used to simplify data collection by grouping goods and services which have similar data requirements, e.g. Channel, Assessment.	See individual outputs for relevant values	None
Output type	Provides a more detailed classification of outputs.	See individual outputs for relevant values	None
Activity type	Broadly defines the changes being made to the output using terms such as: install, maintain, modify, remove, develop and review.	See individual outputs for relevant values	None
Year completed	Identifies the financial year in which the output was completed. Outputs are reported annually. Where the same output is delivered again in the following year (e.g. maintenance of vegetation) the outputs should be reported separately.	Provided by delivery agent as part of output reporting	The Financial year is to be expressed as a 4 digit integer where 1718 is used to denote the Financial year 2017/18.

Attribute	Current Description	Source	Guidance Note
Fund source	The name of the key fund source. This could be a code for or name of a DELWP investment program or, where the investor is not DELWP, the appropriate agency code or name for the investment source. In the case of funding from private individuals, it would be enough to say 'Private landholder'.	Provided by relevant agency or investment program	See Appendix B, for a list of Current fund sources for Environmental Programs, and the codes to be used in the submission of output data. It is not sufficient to use text descriptions for the VWPIF funded outputs. You must use the fund source code as identified in PIRS. Note that only one Fund source can be assigned to the one output feature. The term 'key' fund source should be read to mean 'the' fund source. * See note on page 12 under 4.8 *Only one funding source per* output.
Project ID	For investment through the VWPIF this should be the Project Implementation and Retrieval System (PIRS) number for the project. Where the investor does not use PIRS, a project id should be provided through the grant application.	Provided by relevant agency or investment program.	The requirement for a PIRS code to be used where it exists, and for non PIRS projects, a code that can be easily linked to the investment program is reinforced.
Delivery agent	Identify the community partner or relevant government agency involved in the delivery of the output. This information identifies outputs that are delivered with significant support from community groups or are delivered through government agencies. If delivery is shared across multiple agencies, provide the major delivery partner. This is general information, so there is no need to specify the exact name of the group – use one of the following: • Landcare • Management committee • Friends-of group • Private land manager • Traditional owner • Catchment Management Authority • Parks Victoria • DELWP • Trust for Nature	Provided by delivery agent as part of output reporting	None

Attribute	Current Description	Source	Guidance Note
River-related works	Identifies if the output occurred on the left or right side of the river (facing downstream). Left Right Both Not applicable	Provided by relevant agency	This attribute identifies all works of a riparian nature, or undertaken in the riparian zone. The value of this information is that it helps answer questions relating strategic plan targets, such as % waterway restored on both sides of the waterway.
Planned management outcome	The key management outcomes that the output is contributing to in the appropriate plan or strategy. If there is no specific outcome documented in a plan (or no plan), provide an appropriate title from the list in Appendix 1.	Provided by relevant agency or investment program	If there is no specific outcome documented in a plan (or no plan), provide an appropriate title from the key management outcome list as provided in Appendix 2 of the Output Data Standards.
Planned management outcome direction of change	Broadly defines the outcomes sought using the following categories: Increase Maintain Reduce	See individual outputs for relevant values	None
Region, area or reach	Relevant region, area or reach that is the subject of the management outcome, e.g. appropriate river reach in AVIRA. Appropriate areas are defined in plans and strategies and should be provided by investors.	Identified by relevant agency or investment program	Where a specific area is not supplied by the investor, provide a description of the area impacted by the output. For instance, the name of a park, small locality or reference to identifiable landmarks.
Specific Attribute #1 (e.g. Volume of water conveyed)	Specific attributes are provided within each Standard. Provide a new tabular column for each specific attribute as required.		None

6. Guidance for Individual Outputs

This section provides guidance notes in relation to individual outputs. It provides information on known issues and advice in their treatment in relation to:

- Attribute issues
- Interpretation
- Units
- Specific examples of use where required to illuminate an issue and advise to address it.
-

**All outputs are included in this section, however, not all outputs include guidance. In the future, more advice may be added to this section.

6.1 Structural Works

Structural works are outputs associated with the management of man-made structures. Structural works include:

Output Type	
1	**Structural works**
1.1	Channel
1.2	Water storage
1.3	Pump
1.4	Irrigation infrastructure
1.5	Waterway structure
1.6	Terrestrial structure
1.7	Terrestrial feature
1.8	Monitoring structure
1.9	Fence
1.10	Visitor facility
1.11	Road
1.12	Crossing

1.1 Channel

Specific attributes

Title	Output type	Activity type	Spatial object	Water volume	Specific type
Description	Select one from list	Select one from list	Location of structure	Volume of water conveyed	Select one from list
Valid values	Channel Drain	Install Maintain Modify Remove	Line	ML	Community Environmental water Irrigation supply Primary Swale
Guidance Note	The above Valid values are to be treated as separate options – Channel or Drain.	None	None	None	None

General Guidance Note

There is a typographical error. Valid attributes for the 'Output type' attribute include either 'Channel' or Drain'.

1.2 Water Storage

Specific attributes

Title	Output type	Activity type	Spatial object	Water volume	Specific type
Description	Select one from list	Select one from list	Location of structure	Volume of water stored	Select one specific type for the output
Valid values	Constructed wetland Dam Sump Tank Trough Weir	Install Maintain Modify Remove	Point	ML N/A	Effluent Irrigation Livestock Re-use system
Guidance Note	None	None	None	None	None

1.3 Pump

Specific attributes

Title	Output type	Activity type	Spatial object	Tenure
Description	Select one from list	Select one from list	Location of structure	Land manager
Valid values	Ground water Surface water	Install Maintain Modify Remove	Point	Private Public
Guidance Note	None	None	None	None

1.4 Irrigation infrastructure

Specific attributes

Title	Output type	Activity type	Spatial object	Previous type	Specific activities	Water savings
Description	Select one from list	Select one from list	Location of irrigation structure	Select the previous type of infrastructure where there was some	List the activities	Estimate the water savings
Valid values	Gravity Pressurised	Install Maintain Modify Remove	Polygon	Drip Flood/furrow Other N/A	Laser levelling Laying pipe Scheduling	ML
Guidance Note	None	None	None	None	None	None

General Guidance Note

This output relates to irrigation improvements rather than irrigation structures. This output should be used in combination with other outputs (such as 1.1 Channel, 1.2 Water storage, or 1.3 Pump) to describe overall irrigation infrastructure improvements.

For an example of how this Standard can be applied in relation to works undertaken under the Sustainable Irrigation Programs, see Case Study 3 – Sustainable Irrigation (Appendix E) of this document.

1.5 Waterway structure

Specific attributes

Title	Output type	Activity type	Spatial object
Description	Select one from list	Select one from list	Location of structure
Valid values	Carp screen Chute Fish barrier Fishway Flow regulator Groyne Large wood Outlet Pile field Rock seeding Sill	Install Maintain Modify Remove Replace	Point
Guidance Note	None	None	None

1.6 Terrestrial structure

Specific attributes

Title	Output type	Activity type	Spatial object
Description	Select one from list	Select one from list	Location of structure
Valid values	Hygiene station Sediment trap Erosion control	Install Maintain Modify Remove Replace	Point
Guidance Note	None	None	None

1.7 Terrestrial feature

Specific attributes

Title	Output type	Activity type	Spatial object	Target Species
Description	Select one from list	Select one from list		Select species ID from Victorian Biodiversity Atlas
Valid values	Man-made ground feature Natural ground feature Nest box	Install Maintain Modify Replace	Point	
Guidance Note	None	None	None	None

1.8 Monitoring structure

Specific attributes

Title	Output type	Activity type	Spatial object	Description
Description	Select one from list	Select one from list	Location of structure	Identify what the structure is intended to monitor.
Valid values	Bore Hide Measuring Station Trap	Install Maintain Modify Remove Replace	Point	Fauna Flora Groundwater Soil Surface water Weather
Guidance Note	None	None	None	None

1.9 Fence

Specific attributes

Title	Output type	Activity type	Spatial object	Change in access	Specific type	Target species	Area fenced
Description	Select one from list	Select one from list	Location of structure. Where sections of fence are >10 m apart they should be recorded separately	Identify whether the management outcome area represents the containment or exclusion of the disturbance	Select one from list	Select animals not wanted on site	Calculate the area contained/ excluded by construction of fence
Valid values	Bollard Fence	Install Maintain Remove Modify Replace	Line	Containment Exclusion	Conventional Electric Mesh Waterway Combination Other	Domestic stock Environmental pest animals Native species N/A	Hectares
Guidance Note	None	None	None	None	None	None	None

General Guidance Note

In most situations the Fence output type will be used in combination with another output type that is represented by a polygon feature. In most cases, the output will be associated with a plan, some vegetation or other activities – features recorded as polygons.

If a polygon feature is linked to the fence, the 'Area fenced' attribute should describe the area of that polygon.

For example, the Fence output may be used in combination with a Vegetation output to identify the area of revegetation and the fencing associated with it.

A likely exception to the above requirement is where the Fence output is used for replacement or maintenance of an existing fence, e.g. replacing a flood damaged fence. In this case, the area fenced attribute should be left blank.

A 'waterway' fence

In relation to use of the 'Specific type' attribute, the value 'waterway' must not be used to describe a fence installed for riparian purposes. A waterway fence is a description for a flood-proof fence.

When reporting fence, you must always specify 'left', 'right', 'both' or 'not applicable' in the 'River-related works' common attribute. This enables DELWP to identify whether the fence is associated with a waterway and is therefore a riparian output. Fences installed for purposes other than riparian outputs must specify 'not applicable' in the 'River-related works' common attribute.

1.10 Visitor facility

Specific attributes

Title	Output type	Activity type	Spatial object	Data storage	Specific type
Description	Select one from list	Select one from list	Location of structure	Identify where the assessment	Select the from list
Valid values	Building Operations Recreational	Install Maintain Modify Remove Replace	Point	Recweb PV asset system Other N/A	Barbecue Bench-seat Boardwalk Boat ramp Car park Elevated stairs Generator Hand rail Horse yards Hang gliding launch Hut Information shelter Jetty Payment point Picnic shelter Picnic table Retaining wall Rubbish bins Signage Toilet block Trail bike prop Viewing platform
Guidance Note	None	None	None	None	None

1.11 Road

Specific attributes

Title	Output type	Activity type	Spatial object	Data storage	Specific type
Description	Select one from list	Select one from list	Location of structure	Identify where the assessment data is stored	Identify the specific type of road category
Valid values	Firebreak Road Trail	Install Maintai n Modify Remove	Line	PV asset system Recweb Other N/A	Operational Private Public N/A
Guidance Note	None	None	None	None	None

1.12 Crossing

Specific attributes

Title	Output type	Activity type	Spatial object	Data storage	Specific type
Description	Select one from list	Select one from list	Location of structure	Identify where the assessment data is stored	Select one from list
Valid values	Bridge Causeway crossing Culvert Ford	Install Maintain Modify Remove	Point	PV asset system Recweb N/A	900–1,200 mm 900–1,800 mm 1,500–1,800 mm 2,100–2,400 mm 2,100–2,700 mm 3,000–3,600 mm Concrete Concrete/steel Concrete/steel/ timber Concrete/timber Log earth fill Log fill Steel Unknown
Guidance Note	None	None	None	None	None

6.2 Environmental Works

Environmental works outputs are a mixture of goods and services outputs involving the modification of environmental characteristics (e.g. soil, water, vegetation). Environmental works outputs include:

Output Type	
2	Environmental works
2.1	Vegetation
2.2	Weed control
2.3	Pest animal control
2.4	Over-abundant wildlife control
2.5	Threatened species response
2.6	Emergency species response
2.7	Soil treatment
2.8	Earth works
2.9	Rubbish removal

General Guidance Note

The 'Spatial object' should apply the terms 'controlled' and 'targeted' in accordance with the guidance provided in Section 4.3 of this document.

Application of these terms is particularly applicable when capturing the spatial location of Environmental Works, particularly:

- 2.2 Weed Control
- 2.3 Pest Animal Contrail
- 2.4 Over-abundant wildlife
- 2.7 Soil Treatment

For these works 'controlled' area is the gross area often at a property or paddock level.

The term 'Treated' is a sub-unit of the 'controlled' area for which particular treatments such as the spraying of targeted weeds were undertaken.

Hence, 'Treated' will be smaller than, and expressed as a portion or percentage of the 'controlled' area.

2.1 Vegetation

Specific attributes

Title	Output type	Activity type	Spatial object	Specific activities
Description	Select one from list	Select one from list	Area where vegetation has been established, maintained or modified	Select multiple from list
Valid values	Mixed Native indigenous Native non-indigenous Non-native	Establish Maintain Modify	Polygon	Direct seeding Long-stem planting Mulching Plant guarding Seed bank introduction Supplementary watering Thinning Seedling planting
Guidance Note	None	None	None	None

General Guidance Note

The Vegetation output can be used in combination with the Agricultural practice output (3.2) to identify changes to land cover where this is viewed to have significant environmental benefits. Hence, the Vegetation output can be used to identify the establishment of native vegetation (e.g. native pasture, saltbush), and non-native vegetation (e.g. legumes, crop types).

2.2 Weed control

Specific attributes

Title	Output type	Activity type	Spatial object	Specific activity
Description	Select one from list	Select one from list	The gross area over which weeds were controlled, including the area searched for target weeds and treated where present.	Select primary treatment method from list
Valid values	Non-woody Woody	Establish Maintain Modify	Polygon	Biological Chemical Manual Mechanical
Guidance Note	None	None	None	None

Title	Biosecurity aim	Treatment coverage	Target species arrangement	Target species
Description	Select one from list	Estimate the percentage (nearest 10%) of the output polygon that was treated	Select one from list identifying the arrangement of the target species within output polygon	Identify the species ID using Victorian Biodiversity Atlas
Valid values	Asset-based protection Containment Eradication Prevention	Percentage	Scattered individuals Small patches Large patches Majority coverage Complete coverage	
Guidance Note	None	None	None	None

2.3 Pest animal control

Specific attributes

Title	Output type	Activity type	Spatial object	Biosecurity aim	Specific activities	Target Treatment coverage	Target species
Description	Select one from list	Select one from list	The gross area over which pest animals were controlled, including the area searched for target species and treated where present. (Due to the diffuse nature of pest animal treatment this will be an estimate)	Select one from list	Select one from list	Estimate the percentage (nearest 10%) of the output polygon that was treated	Select species ID from Victorian Biodiversity Atlas
Valid values	Estuarine Inland aquatic Marine Terrestrial	Establish Maintain Modify	Polygon	Asset based protection Eradication Containment Prevention	Bait Biological Fumigate Habitat destruction Manual removal Muster Shoot Trap	Percentage	
Guidance Note	None	None	See note below	None	None	None	None

General Guidance Note

As a general rule, based on current research advice, the following standard buffers should be applied in spatially depicting the gross area controlled when using baits for pest animal control:

- Baits for Fox control – 1000m radius
- Baits for Rabbit control – 200m radius

2.4 Over-abundant wildlife control

Specific attributes

Title	Output type	Activity type	Spatial object	Specific activities	Treatment coverage	Target species
Description	Select one from list	Select one from list	The gross area over which over-abundant wildlife was controlled, including the area searched for target species and treated where present. Due to the diffuse nature of animal treatment this will be an estimate	Select one or more from list	Estimate the percentage (nearest 10%) of the output polygon that was treated	Select species ID from Victorian Biodiversity Atlas
Valid values	Estuarine Inland aquatic Marine Terrestrial	Establish Maintain Modify	Polygon	Disturb (e.g. noise) Fertility control Shoot Translocate Trap Muster Poison	Percentage	
Guidance Note	None	None	None	None	None	None

2.5 Threatened species response

Specific attributes

Title	Output type	Activity type	Spatial object	Specific activities	Treatment Area	Target species
Description	Select one from list	Select one from list	Location of response	Select one or more from list	Estimate the area over which response undertaken	Select species ID from Victorian Biodiversity Atlas
Valid values	Estuarine Inland aquatic Marine Terrestrial	Establish Maintain Modify	Point	Caging Captive breeding Capture/release Collect/ store seed or vegetative material Inoculation of soil Pollination Propagation Reintroduction/ translocation Supplementary watering/feeding Other	Hectares N/A	
Guidance Note	None	None	None	None	None	None

2.6 Emergency species response

Specific attributes

Title	Output type	Activity type	Spatial object	Specific activities	Treatment Area	Target species	Event type
Description	Select one from list	Select one from list	Location of response	Select one or more from list	Estimate the area over which response undertaken	Select species ID from Victorian Biodiversity Atlas	Select one or more from list
Valid values	Estuarine Inland aquatic Marine Terrestrial	Establish Maintain Modify	Point	De-oiling Disentanglement Rehabilitation Translocation Veterinary treatment Whale stranding Other	Hectares N/A		Chemical spills Disease Entanglement Fire Flood Stranding Other
Guidance Note	None	None	None	None	None	None	None

2.7 Soil treatment

Specific attributes

Title	Output type	Activity type	Spatial object	Specific activities
Description	Select one from list	Select one from list	Location where soil treatment was done	Select one from list
Valid values	Biological Chemical Mechanical Temperature	Establish Maintain Modify Remove	Polygon	Biological additive Clay topping Ripping Scraping Chemical ameliorant Drying Liming Organic matter
Guidance Note	None	None	None	None

2.8 Earth works

Specific attributes

Title	Output type	Activity type	Spatial object	Specific activities	Treatment Area
Description	Select one from list	Select one from list	Location where earth work was altered	Select one from list	Calculate area over which works undertaken
Valid values	Armouring Battering Barrier Dredging Levee Levelling	Establish Maintain Modify Remove	Point	Estuary closing Estuary opening Reclamation Other	Hectares
Guidance Note	None	None	None	None	None

2.9 Rubbish Removal

Specific attributes

Title	Output type	Activity type	Spatial object	Specific activity	Treatment coverage
Description	Select one from list	Select one from list	The gross area over which rubbish was removed, including the area searched for rubbish and treated where present.	Select primary treatment method from list	Estimate the percentage (nearest 10%) of the output polygon that was treated'.
Valid values	Estuarine Inland aquatic Marine Terrestrial	Establish Maintain Modify	Polygon	Manual Mechanical	Percentage
Guidance Note	None	None	None	None	None

6.3 Management Services

Management services outputs involve the modification of land management, generally described as behaviour or practice change. Often associated with a management agreement, such changes may be delivered immediately (e.g. planned burning) or across the year (e.g. controlled grazing). Management services outputs include

Output Type	
3	**Management services**
3.1	Grazing
3.2	Agricultural practice
3.3	Water
3.4	Fire

3.1 Grazing

Specific attributes

Title	Output type	Activity type	Spatial object	Specific activity	Timing	Intensity
Description	Select one from list	Select one from list	Area over which grazing output has occurred	Select one from list	Select one from list	Select one from list
Valid values	Riparian Terrestrial Agricultural	Establish Maintain Modify Remove	Polygon	Continuous Controlled Exclusion	Autumn Winter Spring Summer N/A	High Medium Low N/A
Guidance Note	None	None	None	None	None	None

General Guidance Note

The grazing output should only be reported when we specifically invest in stock management. It should not be reported when grazing regime is changed due to investment in other outputs, such as fencing or a management plan.

Outputs that represent the benefits/outcomes of the investment, but have no specific investment activities associated, must not be reported.

3.2 Agricultural practice

Specific attributes

Title	Output type	Activity type	Spatial object	Specific activities
Description	Select one from list	Select one from list	Area over which agricultural practice output has occurred*	Select one from list
Valid values	Dryland Irrigation	Establish Modify Maintain Remove	Polygon	Biomass/ groundcover Cropping Nutrients Chemicals Other
Guidance Note	None	None	None	None

General Guidance Note

* It is noted that in PIRS the unit measure of this output is Number (not Area, as per Vegetation). Area is to be expressed in Hectares.

3.3 Water

Specific attributes

Title	Output type	Activity type	Spatial object	Timing	Volume of	Type of flow	Source of flow
Description	Select one from list	Select one from list	Area over which water output has occurred	Timing of water released/withheld	Identify the total volume of	Select one or more from list	Select one from list
Valid values	Estuary River reach Wetland Floodplain	Establish Maintain Modify Remove	Polygon	Autumn Spring Summer Winter	ML N/A	Bank full Base flow Cease to flow Fill Flooding Fresh Low flow Overbank flow Partial fill Top-up Drying	Consumptive Mixed Water holdings
Guidance Note	None	None	See below note.	None	None	None	None

General Guidance Note

As a general rule the polygon for a section of a watercourse will developed by buffering the section of the watercourse between the point where the release of water commenced to where the release effectively stops impacting the section of watercourse. This includes the delivery of water into wetlands, where the source of water released to the delivery point into the wetland, is to be identified. A buffer distance of 20m is typically applied.

3.4 Fire

Specific attributes

Title	Output type	Activity type	Spatial object
Description	Select one from list	Select one from list	Area over which fire output occurred
Valid values	Ecological Fuel Reduction	Establish Maintain	Polygon
Guidance Note	None	None	None

6.4 Planning and Regulation

Planning and regulation outputs are a mixture of goods and services outputs related to the information needs of planning and regulation. Planning and regulation outputs include:

Output Type	
4	**Planning and regulation**
4.1	Approval and advice
4.2	Management agreement
4.3	Assessment
4.4	Engagement event
4.5	Partnership
4.6	Plan
4.7	Publication
4.8	Information management system

General Guidance Note

Two areas of general guidance relate to the outputs identified in previous sections: **How do I avoid large polygons?** and **What if my Engagement Event is not at my project site?**

Non-physical outputs such as Management Services and Planning and Regulation must be represented as spatial objects. However, the following rules should be applied to avoid large polygons that cover a whole region and obscure other works:

- Where a plan relates to an individual property, or collection of properties or a wetland, a polygon describing the area to which the plan relates is appropriate.
- Where the output relates to an area that is less than a quarter of a CMA (for example, a sub-catchment or smaller) a polygon must be used.
- Where a plan or strategy relates to the CMA as a whole, the point location for the CMA head office should be used.

Where an Engagement event (4.4) is held at an office location, instead of on-site for convenience, the location of where the engagement event was held should be recorded. The' Name/Title' attribute should be used to identify the location to which the event relates where viewed to be of value.

4.1 Approval and Advice

Specific attributes

Title	Output type	Activity type	Spatial object	Status	Specific type
Description	Select one from list	Select one from list	Identify the centre of the location/ property relating to the administered item	Select one from list	Select one from list
Valid values	Advice Lease Licence Notice Permit Referral response	Establish Maintain Modify Remove	Point	Exempt Issue Refuse Reject Support	Flood Game management Land management Native vegetation New irrigation Weeds and pest animals Soil and salinity Water access Waterway works
Guidance Note	None	None	None	None	None

General Guidance Note

It is noted that the details contained in the Approval and Advice output are typically sourced from the IPAWS (Integrated Planning and Works System for statutory referrals, advices and permits) where Statutory approvals and advice (such as Floodplain Statutory approvals and advice) are exported from IPAWS and used to populate information into this output. IPAWS is being used by all CMAs and the data is typically exported once a year.

4.2 Management agreement

Specific attributes

Title	Output type	Activity type	Spatial object	Party	Duration
Description	Select one from list	Select one from list	Area/s covered by the agreement	Identifies the status of the party entering into the agreement	Duration of the agreement where relevant Agreements on property title are considered long term or permanent (99 years should be used).
Valid values	Binding non-perpetual Binding perpetual	Establish Maintain Modify Remove	Polygon/s	Private landholder Public landholder	Years
Guidance Note	None	None	None	None	None

General Guidance Note

It is noted that where the duration for an agreement is either long-term or perpetual, such as in the case of many riparian agreements and Trust for Nature Covenants, a value of 99 years should be used. 'Long-term' for riparian agreements refers to those agreements which are binding on the existing landholder for the time of their ownership of the property (which could be for several decades) but they are not on-title so not binding on future owners.

Where the output relates to an area that is less than a quarter of a CMA (for example, a sub-catchment or smaller) a polygon must be used.

4.3 Assessment

Specific attributes

Title	Output type	Activity type	Spatial object	Data storage	Database ID	Specific activities
Description	Select one from list	Select one from list	Area where assessment was conducted	Identify where the assessment data is stored. Including DELWP databases where appropriate	Identify the ID for the entries into the database	Select one from list
Valid values	Agronomic Cultural Ecological Fauna Flora Geological Geospatial Heritage Invasive species Property Social Soil Groundwater Surface water Weather	Establish Maintain Modify	Polygon	Agency database Atlas of Living Australia, Birds Australia Atlas Victorian Biodiversity Atlas Victoria water data warehouse Salinity Register Waterwatch/ Estuary watch data warehouse Monitoring Sites Database		Inspection Survey Model Remote Visual Other
Guidance Note	None	None	None	None	None	None

4.4 Engagement event

Specific attributes

Title	Output type	Activity type	Spatial object	Name/title	Participants
Description	Select one from list	Select one from list	Location where the event was held	Provide the name of the event	Total number of participants who attended
Valid values	Conference Field day Meeting Presentation Training Workshop	Attend Coordinate Establish Sponsor Support	Point	Text field	
Guidance Note	None	None	None	None	None

Title	Event length	Number of events	Target audience	Focus
Description	Length of the event, to the nearest hour	Where events have identical values for all other attributes (e.g. location, type, year completed) they	Select multiple from list	Record the primary focus for the event
Valid values	Hours	Events	Agency staff CBNRM group General community Indigenous Land managers Schools Youth Other	Conservation management/ techniques Data management and reporting General Occupational health and safety Survey and monitoring Recruitment Planning Consultation Collaboration
Guidance Note	None	None	None	None

General Guidance Note

The spatial location should show where the engagement event occurred.

Where an engagement event (4.4) is held at an office location remote from the actual project area, the spatial location assigned should be that of where the engagement event was held. The Name/Title attribute should identify the location to which the overall project relates.

4.5 Partnership

Specific attributes

Title	Output type	Activity type	Spatial object	Parties	Duration
Description	Select one from list	Select one from list	Identify a location to 'represent' partnership operations	Identify the organisations or individuals who are parties to the partnership	Duration of the partnership, where considered permanent 99 years should be used
Valid values	Agencies/ corporates Community groups Mixed	Establish Maintain Modify	Point	List	Years
Guidance Note	None	None	None	None	None

General Guidance Note

Partnerships should be based on the agreement documentation (e.g. memorandum of understanding, or equivalent) that may be legally or non-legally binding, but which identifies, and is signed by, all partners to the agreement. Hence, there is one partnership for each such agreement, which may comprise two or more partners. Where there is separate agreement documentation with each partner, each agreement may be viewed as a separate partnership.

4.6 Plan

Specific attributes

Title	Output type	Activity type	Spatial object	Name/title
Description	Select one from list	Select one from list	Area covered by the plan	Unique identifier for plan/strategy recorded in the outputs
Valid values	Engagement Property Management Strategy	Establish Modify Review	Polygon	Full title of plan/ strategy
Guidance Note	None	None	None	None

Specific attributes

Title	Year commenced	Duration	Focus	Target audience
Description	Commencement date (month/year)	Duration of the plan (years)	Select multiple from list	
Valid values	Month/year	Years	Conservation Culture/heritage Fire Fish Flora Irrigation Management practices Fauna Other	Agency staff CBNRM group General community Indigenous Land managers Schools Youth Other
Guidance Note	None	None	None	None

4.7 Publication

Specific attributes

Title	Output type	Activity type	Spatial object	Specific type	Frequency	Target audience
Description	Select one from list	Select one from list	Identify a location to 'represent' publication's target audience	Select one from list	Select one from list	
Valid values	Written Audio Visual	Establish Maintain Modify	Point	Fact sheet Media release Newsletter Newspaper Report Social media Standard Website Television Video Radio DVD Flyer/ Pamphlet Booklet Podcast Other	Once Ad hoc Annually Monthly Quarterly	Agency staff CBNRM group General community Indigenous Land managers Schools Youth Other
Guidance Note	None	None	None	None	None	None

4.8 Information management system

Specific attributes

Title	Output type	Activity type	Spatial object	Name/title	Owner
Description	Select one from list	Select one from list	Identify a location that 'represents' the output's application.	Provide the name of the system	List who will own and maintain the system
Valid values	Database Decision support	Establish Maintain Modify	Point	Text	Text
Guidance Note	None	None	None	None	None

7. Where can I to get help?

Who to contact

Advice on who to contact in relation to the application of the DELWP Output Data Standards, are as follow:

Dr Dale Watson

Manager Integrated Catchment Reporting
Catchments, Waterways, Cities and Towns
Water and Catchments | Department of Environment, Land, Water and Planning

Level 13, 8 Nicholson St, East Melbourne, Victoria 3002
T: 03 9637 9425 | **M:** 0439 392 842 | **E:** dale.watson@delwp.vic.gov.au

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On-line Resources

An on-line resource with links to a number of key reporting documents, including the current version of the Output Data Standards and Technical Guidance Documentation is available at the following DEWLP web-page:

https://www.water.vic.gov.au/waterways-and-catchments/our-catchments/integrated-reporting

In the future we will use this page to update related information; including any additional guidance for reporting

8. How to contribute to this document?

This Technical Guidance Document will be reviewed and updated on an annual basis.
Feedback on this document, including issues, contributing material, or thoughts on the material provided should be emailed to:

E: dale.watson@delwp.vic.gov.au

Appendix A DELWP Output Data Standards

Output Type	
1	**Structural works**
1.1	Channel
1.2	Water storage
1.3	Pump
1.4	Irrigation infrastructure
1.5	Waterway structure
1.6	Terrestrial structure
1.7	Terrestrial feature
1.8	Monitoring structure
1.9	Fence
1.10	Visitor facility
1.11	Road
1.12	Crossing
2	**Environmental works**
2.1	Vegetation
2.2	Weed control
2.3	Pest animal control
2.4	Over-abundant wildlife control
2.5	Threatened species response
2.6	Emergency species response
2.7	Soil treatment
2.8	Earth works
2.9	Rubbish removal
3	**Management services**
3.1	Grazing
3.2	Agricultural practice
3.3	Water
3.4	Fire
4	**Planning and regulation**
4.1	Approval and advice
4.2	Management agreement
4.3	Assessment
4.4	Engagement event
4.5	Partnership
4.6	Plan
4.7	Publication
4.8	Information management system

Appendix B DELWP and other Programs

Current programs, and the fund source codes to be used in the submission of output data. Where provided, please use the fund source codes identified below.

For all others, please use the exact text description provided below. Where there is no appropriate code, use a short plain language description from the funding agreement.

Code	Environmental Program / Fund Source
CW514-47	Environmental Water – Environmental Water Reserve Officers
CW514-48	Environmental Water Infrastructure Works and Measures
CW514-49	Environmental Water Improving and Demonstrating Outcomes
CW514-50	Environmental Water Community Engagement
CW514-57	Environmental Water Community Engagement - Shared benefits
CW514-51	On Ground Works
CW514-52	Regional Riparian Action Plan
CW514-53	Water Statutory Functions
CW514-54	Snowy River Restoration
CW514-55	Gippsland Lakes Coordination Committee
CW514-56	Our Catchments Our Communities (OCOC) - Integrated Catchment Management
CW514-59	CMA Monitoring & Research
CW514-60	Improving Ramsar Site Management
CW514-58	Partnerships for ICM
CW513-57	On-Farm Water Use Efficiency and Best Practice
CW513-58	BSM2030 and Monitoring
CW513-59	Irrigation Frameworks
CW513-60	Irrigation Drainage Works Program
LM010-61	Sustainable Rural Landscapes
	Natural Disaster Relief Recovery Assistance (NDRRA) (Federal)
	National Landcare Program (Federal)
	State Biodiversity
SF211	Biodiversity on Ground (BOG) Tranch 1 (16-17 ERSC Decision)
SF065	Biodiversity on Ground (BOG) Tranch 2 (17-18 ERSC Decision)
CR232	Threatened Species Protection Initiative (TSPI)
CR230	Victorian Environmental Partnerships Program (VEPP)
	Murray Darling Basin Programs (northern CMAs)
	Port Phillip Project Bay Environment Management Plan (protecting the Bay)

Appendix C Case Study 1 - Environmental Water

Case Study provided by North Central CMA

What is best practice when reporting on?

Environmental Water Program works

that trigger fish breeding, boost vegetation, improve water quality and provide habitat for birds and animals?

The North Central's Environmental Water Reserve Officer project staff use output data in an annual cycle. The year is kicked off with Environmental Water Advisory Group meetings and relevant Traditional Owner engagement activities (recorded in **4.4 Engagement Event**, mapped in internal web-map) to review last year's activities and inform the next years, for each system. A Seasonal Watering Proposal is drafted (recorded in **4.6 Plan**, mapped in internal web-map) and submitted for the Victorian Environmental Water Holder (VEWH) for approval and inclusion in the Seasonal Watering Plan.

Water is adaptively managed using the Seasonal Watering Plan, actual water availability, current river conditions and weather information (recorded in **3.3 Water**, standard simplified buffered polygons of the system from delivery to destination, are copied for each flow and attributed with the flow details, in our web-map system). Public notices are printed in local newspapers to keep landholders aware of upcoming flows (recorded in **3.7 Publication** Written, mapped in our web-map system). A report of the years flows are available from our finance system, with overnight updates between GIS and finance systems. Each year photopoint and other monitoring are undertaken to understand shorter and longer term impacts of watering events (recorded in **4.3 Assessment**, mapped in our web-map). This information is reviewed and incorporated into the next year's cycle. The team is held to account monthly for delivering actuals (dollars and outputs) against budget each month.

Summary of outputs applied

Output applied	*Activity*
4.4 Engagement Event	Environmental Water Advisory Group meetings and relevant Traditional Owner engagement activities.
4.6 Plan	Seasonal Watering Proposal drafted and submitted for the Victorian Environmental Water Holder (VEWH) for approval and inclusion in the Seasonal Watering Plan.
3.3 Water	Adaptively manage water using the Seasonal Watering Plan, actual water availability, current river conditions and weather information.
3.7 Publication	Public notices printed in local newspapers to keep landholders aware of upcoming flows.
4.3 Assessment	Each year photopoint and other monitoring undertaken to understand shorter and longer-term impacts of watering events.

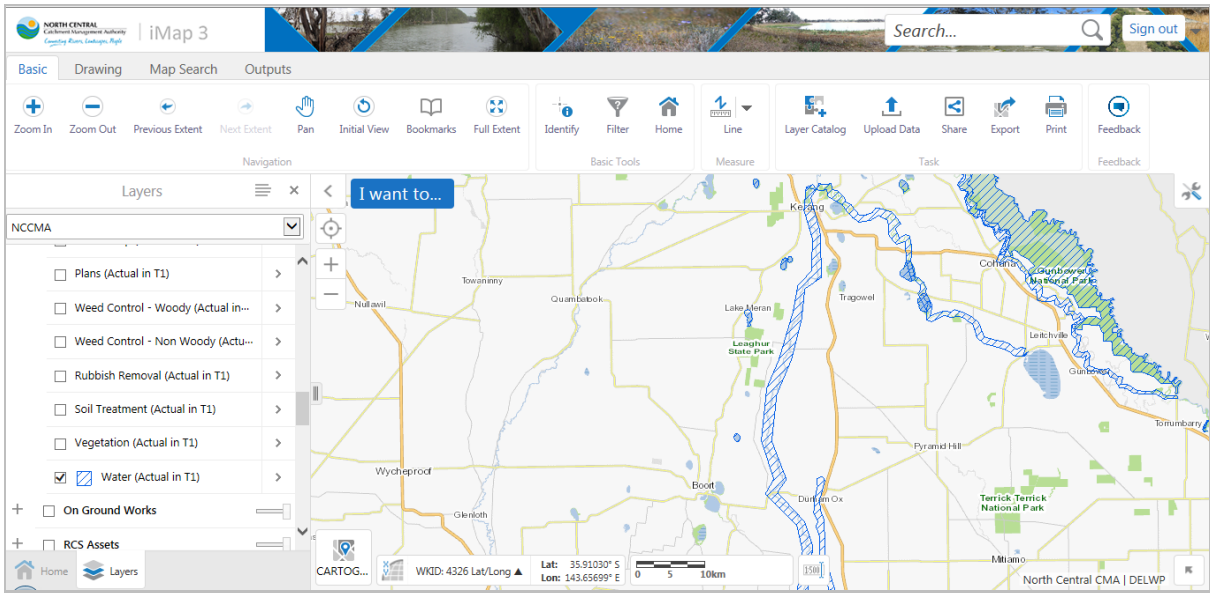

Figure 1. Screen view of mapping of 3.3 Water output information

Figure 2. Photograph from monitoring site (recorded in 4.3 Assessment) on Appin South Bridge, December 2011.

Figure 3. Photograph from monitoring site on Appin South Bridge, February 2017.

Appendix D Case Study 2 – Landcare

Case Study provided by North Central CMA

What is best practice when reporting on?

Landcare Program works

that protect, enhance, and restore our natural environment, and improve agricultural productivity in partnership with landholders, landcare groups, and the wider community?

The North Central Landcare Grants run over an eighteen month cycle. During the application process (normally around eight weeks, 15 May to 30 June, using SmartyGrants), groups are required to map their intended outputs, using an external facing simplified web-map (usually **1.9 Fence**, **2.1 Vegetation**, **2.2 Weed control**, **2.3 Pest animal control**, **4.4 Engagement Event**). These output quantities (generated from the mapping) are used to help assess the project (online, through SmartyGrants). Grant agreements are generated, in August, from SmartyGrants (including output quantities) and sent to groups for signing and payment upon invoice.

The groups have just over twelve months to deliver their project. Reporting is submitted through SmartyGrants and our web-map, in October. The planned (intended) outputs from the application are copied into the reporting web-map system and if they align with what was actually delivered, groups simply confirm this. Otherwise, the outputs are re-mapped by Landcare. Reporting with outputs is provided to the DELWP Landcare team in the second December.

The output quantities are used in other reporting, including Landcare Report Cards and CMA's Action and Achievements report. A number of Landcare Groups or Networks have asked to map historical or non-CMA funded outputs to enable a clear picture of their works history. A revised and simplified version of the outputs is provided to all groups so they can achieve this task. Annual training is provided to relevant groups (Engagement event, mapped in our web-map) from the regions 160 active groups.

Summary of outputs applied

Output applied	*Activity*
1.9 Fence	Groups map intended outputs using SmartyGrants. Planned (intended) outputs from the application are copied into the reporting web-map system and if they align with what was actually delivered, groups simply confirm this. Otherwise, the outputs are re-mapped by Landcare
2.1 Vegetation	
2.2 Weed control	
2.3 Pest animal control	
4.4 Engagement event	Annual training provided to relevant groups.

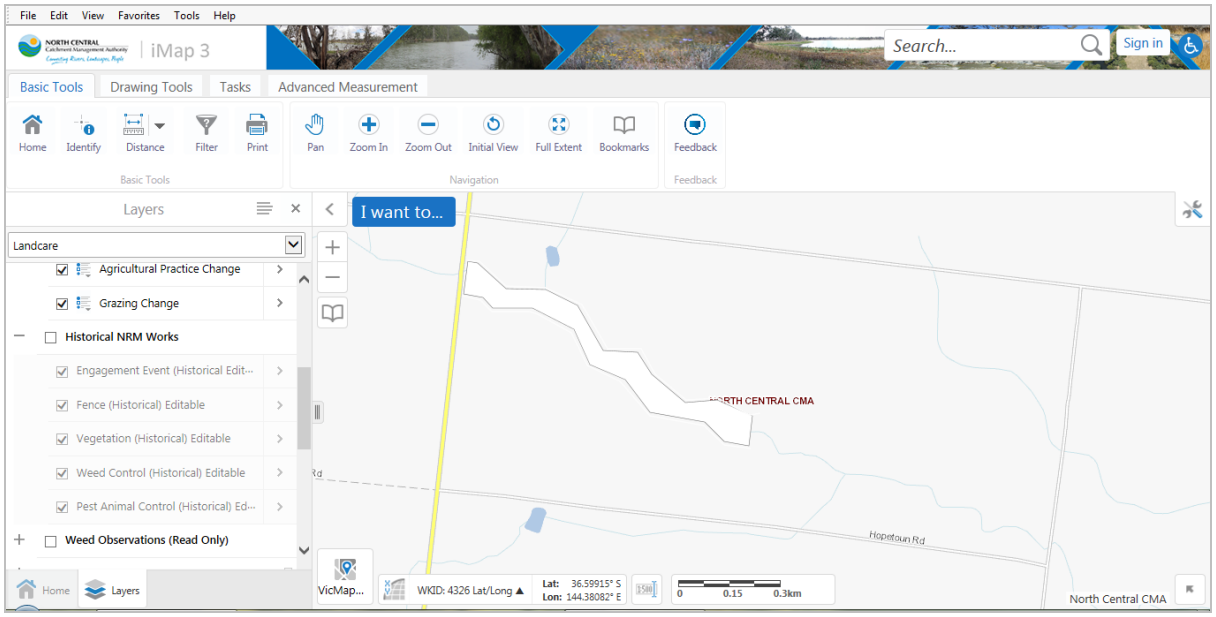

Figure 4. Screen view of Smarty Grants mapping tool which supports mapping of historical works (which accommodates relevant output types).

‘Telling our story’

Telling our delivery story in our own words!

*Delivering **2.1 Vegetation**, and **2.2 Weed control**, with **4.3 Assessment***

Don and Sheelagh Watsons of Bagshot, received a 2016-17 Community Grant to undertake revegetation and stock exclusion fencing along their eroding creek lines. Their fragile soils, paired with overgrazing from previous farming enterprises, left a very dry, bare and susceptible landscape with little to no production value.

Using their farming knowledge and having a clear vision for the future of their property, the landholders sought advice from North Central CMA field and Landcare support staff to revegetate their farm and have since, created some incredible changes to their property in a mere 18 months.

It is often questioned as to why Individuals can access community grants, but the proof is in the pudding! Don and Sheelagh Watson wrote a great application, submitted their final report with valuable detail and narrative, and most importantly, they supported the reported with monitoring photopoints..The Community Grants process benefits greatly from these Individuals who are producing some of the best results we’ve seen in recent grant rounds as shown by their commitment to monitoring and evaluation, in turn improving the ability to report return on investment in a landcare context; and providing access to quality data and story to showcase site rehabilitation.

Don and Sheelagh have removed stock from the property, are committed to staged well-guarded revegetation, supported by proper ground prep and weed control, they’re in this for the long haul but their results in just 18 months, with just over $9,000 of CMA investment, are well worth celebrating!

Tess Grieves
Regional Landcare Coordinator

Figure 5. Photograph of Don and Sheelagh Watsons's area of works in Bagshot prior to treatment.

Figure 6. Photograph of Don and Sheelagh Watsons's area of works in Bagshot 18 months after treatment.

Appendix E Case Study 3 – Sustainable Irrigation

Case Study provided by West Gippsland CMA

What is best practice when reporting on?

Sustainable Irrigation Program works

that reduce adverse impacts of irrigation whilst improving water use efficiency and best practice in environmental and agricultural outcomes?

The aim of the Sustainable Irrigation project undertaken by West Gippsland CMA (WGCMA) is to improve water use efficiency and minimize offsite impacts in the Macalister Irrigation District (MID) through improved management or modernisation of irrigation infrastructure. The following is an example of how the DELWP Output Data Standards are applied in the Sustainable Irrigation project (SIP).

Contact is made with landholders by phone and farm visits and advice is provided to individuals (recorded as **4.1 Approval and advice**, mapped in SIP online map) or at events and field days (recorded as **4.4 Engagement event**, logged in internal engagement register) to raise awareness and generate interest.

Landholders submit funding applications for farm planning or on-farm upgrades. Following an application assessment process, whole farm plans are developed for approved landholders by a third-party contractor (recorded as **4.6 Plan**, mapped in SIP online map).

Landholders may then upgrade their irrigation infrastructure to either a modernised flood (gravity) or spray (pressurised) irrigation system (recorded as **1.4 Irrigation infrastructure**, mapped in SIP online map) or install a re-use system (recorded as **1.2 Water storage**, mapped in SIP online map) in accordance with the whole farm plan. Once the landholder completes the work it is inspected by an Agriculture Victoria Services (AgVic) officer and recorded as an output.

Throughout the year AgVic extension officers conduct on farm agronomic and groundwater assessments, where they take measurements and provide results back to farmers in written format (recorded as **4.3 Assessment**, mapped in SIP online map). AgVic send a weekly email update to irrigators, along with the occasional case study or technical report published by WGCMA (recorded as **4.7 Publication**, mapped in SIP online map).

Quarterly working group meetings are held with partners including Southern Rural Water, AgVic, Environmental Protection Authority, Gippsland Water and Irrigators (recorded as **4.5 Partnership**, mapped in SIP online map) to keep each other informed of what is happening in the MID.

The WGCMA track progress on delivering actuals (dollars and outputs) against budget each month.

The output quantities are used in other reporting, including WGCMA Annual Report, Regional Catchment Strategy implementation and CMA's Action and Achievements report.

Summary of outputs applied

Output applied	*Activity*
4.1 Approval and advice	Contact is made with landholders by phone and one on one farm visits.
4.4 Engagement Event	Events and field days help to provide advice, raise awareness and increase knowledge in irrigation infrastructure modernisation.
4.6 Plan	Following a funding application process, whole farm plans developed for approved landholders.
1.4 Irrigation infrastructure	Landholders upgrade their infrastructure to either a modernized flood (gravity) or spray (pressurized) system.
1.2 Water storage	Landholders install a re-use system.
4.5 Partnership	Quarterly working group meetings are held with partners to share information.
4.3 Assessment	AgVic extension officers undertake farm agronomic assessments and provide written results to landholders.
4.7 Publication	AgVic send a weekly update to irrigators, along with case studies or technical reports published by WGCMA.

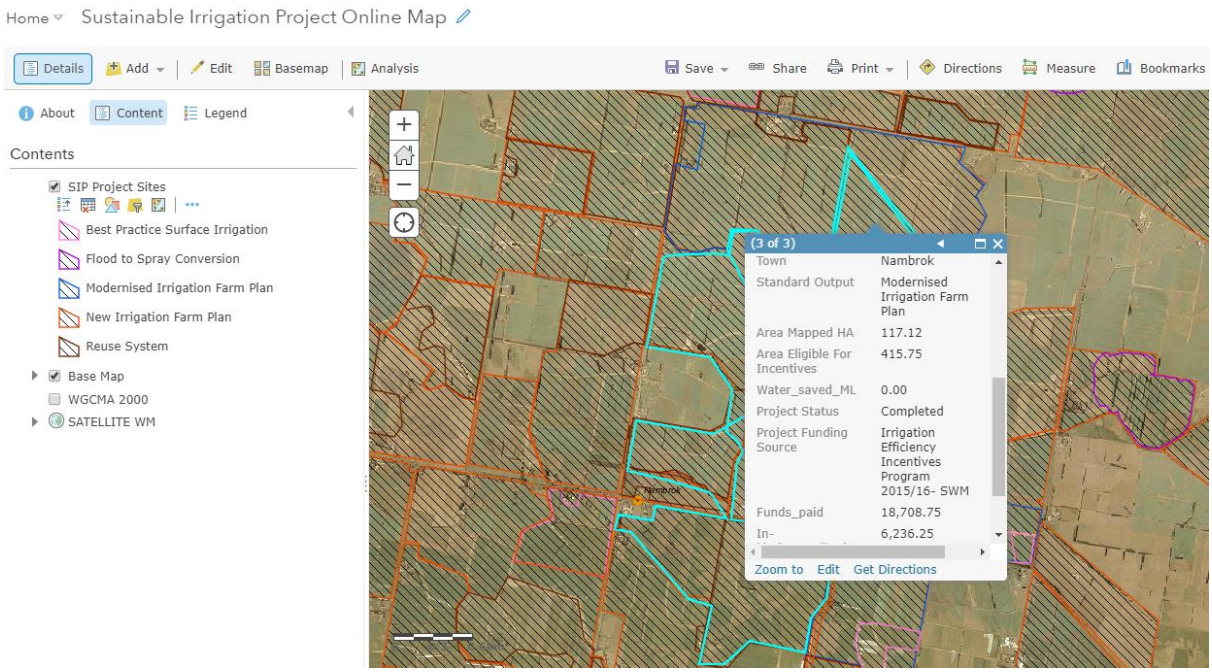

Figure 7. Screen view of Sustainable Irrigation Project ArcGIS Online mapping tool showing project sites and irrigation infrastructure related farm plan details.

Figure 8. Photograph of new irrigation reuse system (1.2 Water Storage) in the Macalister Irrigation District.

Figure 9. Photograph of New centre pivot spray irrigation system (1.4 Irrigation infrastructure) in the Macalister Irrigation District.

Appendix F Case Study 4 – Improving Waterway Health

Case Study provided by West Gippsland CMA

What is best practice when reporting on?

Waterway Health Program works

that support river health, provides more recreational opportunities, improves the habitat for native plants and animals, and offers cleaner drinking water supplies?

Throughout the year WGCMA staff will hold meetings with community groups or land management groups as required to provide information and education about the science behind various management activities (recorded as **4.4 Engagement event**, logged in an internal engagement register, later converted to points). Information sharing related to current program roll out is an important first step in garnering landholder buy into the riparian works program. Landholders will also call the WGCMA requesting information about programs, which often results in a site visit or subsequent site visits (recorded as **4.1 Approval and advice**, mapped in WGCMA online map).

WGCMA delivery team members will then conduct site visits and assess what work is required on the landholder property (recorded as **4.3 Assessment**, mapped in WGCMA online map). Where there is alignment with the WGCMA current programs and priorities, a management agreement will be signed with the landholder for works to take place (recorded as **4.2 Management Agreement**, mapped in WGCMA online map, with the agreement saved in SharePoint). Once the agreement is signed, either the landholder or WGCMA contractors (or a combination of both) will carry out on-ground works in line with the agreement. Works are then recorded upon completion.

Typically works to protect and enhance waterway health will include:

- installation of a fence to prevent stock access to the waterway (recorded as **1.9 Fence**, mapped in WGCMA online map, with output attributes completed in SharePoint);
- possible installation of troughs at the same time as the riparian fence to provide an off-stream watering point (recorded as **1.2 Water storage**, mapped in WGCMA online map, with output attributes completed in SharePoint);
- either initial vegetation establishment or subsequent visits for replanting (recorded as **2.1 Vegetation**, mapped in WGCMA online map, with output attributes completed in SharePoint);
- weed removal on site, which can also include subsequent visits for maintenance (recorded as **2.2 Weed Control**, mapped in WGCMA online map, with output attributes completed in SharePoint);
- stabilisation of a waterway through earthworks (recorded as **2.8 Earthworks**, mapped in WGCMA online map, with output attributes completed in SharePoint); or chute installation (recorded as **1.5 Waterway Structure** mapped in WGCMA online map, with output attributes completed in SharePoint).

The WGCMA track progress on delivering actuals (dollars and outputs) against budget each month. Weave report is run annually to capture all the above outputs for consolidated reporting to DELWP.

The output quantities are used in other reporting, including WGCMA Annual Report, Regional Catchment Strategy Implementation report and CMA's Action and Achievements report.

Summary of outputs applied

Output applied	*Activity*
4.4 Engagement Event	Meetings with community groups or land management groups as required to provide information on current programs.
4.1 Approval and advice	Landholders call the WGCMA requesting information about programs, a site visit or subsequent site visits.
4.3 Assessment	WGCMA delivery team members conduct site visits and assess what work is required on the landholder property.
4.2 Management Agreement	Management agreement will be signed with the landholder for works to take place.
1.9 Fence	On ground works are carried out in line with the management agreement and recorded upon completion. Mapped in WGCMA online map, output attributes completed in SharePoint.
1.2 Water storage	
2.1 Vegetation	
2.2 Weed Control	
2.8 Earthworks	
1.5 Waterway Structure	

Figure 10. Screen view of Waterway Health Program works in ArcGIS Online mapping tool showing a range of works as point, line and area based features.

Figure 11. Photograph of removing a willow infestation (2.2 Weed Control) along the riparian zone.

Figure 12.Photograph of same area as shown in Figure 11, showing how following willow removal (2.2 Weed Control), riparian fencing is erected to exclude stock access (1.9 Fence), ready for follow up weed control (2.2 Weed Control) and revegetation (2.1 Vegetation) to take place.

Appendix G Acronyms

CMA	Catchment Management Authority
DELWP	Department of Environment, Land, Water and Planning (previously DSE)
DSE	Department of Sustainability and Environment (now DELWP)
LGA	Local Government Area
MER	Monitoring, evaluation and reporting
NRM	natural resource management
PIRS	Project Information Retrieval System
PV	Parks Victoria
VEPP	Victorian Environmental Partnerships Program