



Australian Government

Department of Climate Change, Energy,  
the Environment and Water

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#### **Acknowledgements**

The authors thank EMSA Protocol Advisory Group members for their input.

#### **Acknowledgement of Country**

Our department recognises the First Peoples of this nation and their ongoing connection to culture and country. We acknowledge Aboriginal and Torres Strait Islander Peoples as the Traditional Owners, Custodians and Lore Keepers of the world's oldest living culture and pay respects to their Elders past, and present.

#### **Cover**

Clockwise from top left:

Narrow-leaved Mallee revegetation Kangaroo Island SA, Kangaroo Island Landscape Board

Eucalyptus oleosa woodland monitoring WA, Helen Langley

Creamy candles Mt Taylor Nature Reserve ACT, Sandra Walpole

Tiverton Springs monitoring Queensland, Sam Nicol

South East Forest National Park monitoring NSW, TERN

Plant collecting Steve Irwin Wildlife Reserve Cape York Queensland, TERN

Ecological field monitoring data entry using an app, TERN

Scientist using data collection app for monitoring, TERN

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# Summary

This document includes descriptions of a range of Ecological Monitoring System Australia (EMSA) guidance material, which has been prepared to assist with selection of EMSA modules in Natural Heritage Trust (NHT) projects. Please contact the Long-term Monitoring team ([LTMP@dcceew.gov.au](mailto:LTMP@dcceew.gov.au)) if you require any further information.

See the [module documents](#) on the EMSA website for more in-depth information on each module.

The recommended minimum paper size for printing the infographics is A3.

## EMSA module groups and descriptions

- The [EMSA module groups and descriptions](#) infographic provides a high-level summary of all EMSA modules.
- This page categorises the 24 EMSA modules into 7 groups and provides a short description for each module. The modules are listed in alphabetical order within each group.

## EMSA modules linked to plot

- The [EMSA modules linked to plot](#) infographic shows which modules require prior completion of the Plot Selection and Layout module and which do not.
- This page categorises the 24 EMSA modules into 3 groups. The orange tiles are modules that are linked to a plot, i.e., the Plot Selection and Layout module. The green tiles are modules with one or more protocols that rely on completion of the Plot Selection and Layout module (other protocols in these modules can be completed without a linked plot). The blue tiles are modules which can be completed without a linked plot.

## EMSA module links and dependencies

- Refer to the [EMSA module links and dependencies](#) infographics for mind-maps showing links between EMSA modules.
- These pages contain mind-maps of each module in alphabetical order, showing links between modules. Refer to the key included on each page for descriptions of the tile and arrow types.

## MERIT project service type and associated EMSA modules

- See the [MERIT Project service type and associated EMSA modules](#) infographic to see the suggested EMSA modules for each MERIT project service.
- This page includes each of the 35 project services in MERIT with a list of associated EMSA modules under each project service. Refer to the key for a description of the tile types used.

## **EMSA module description table**

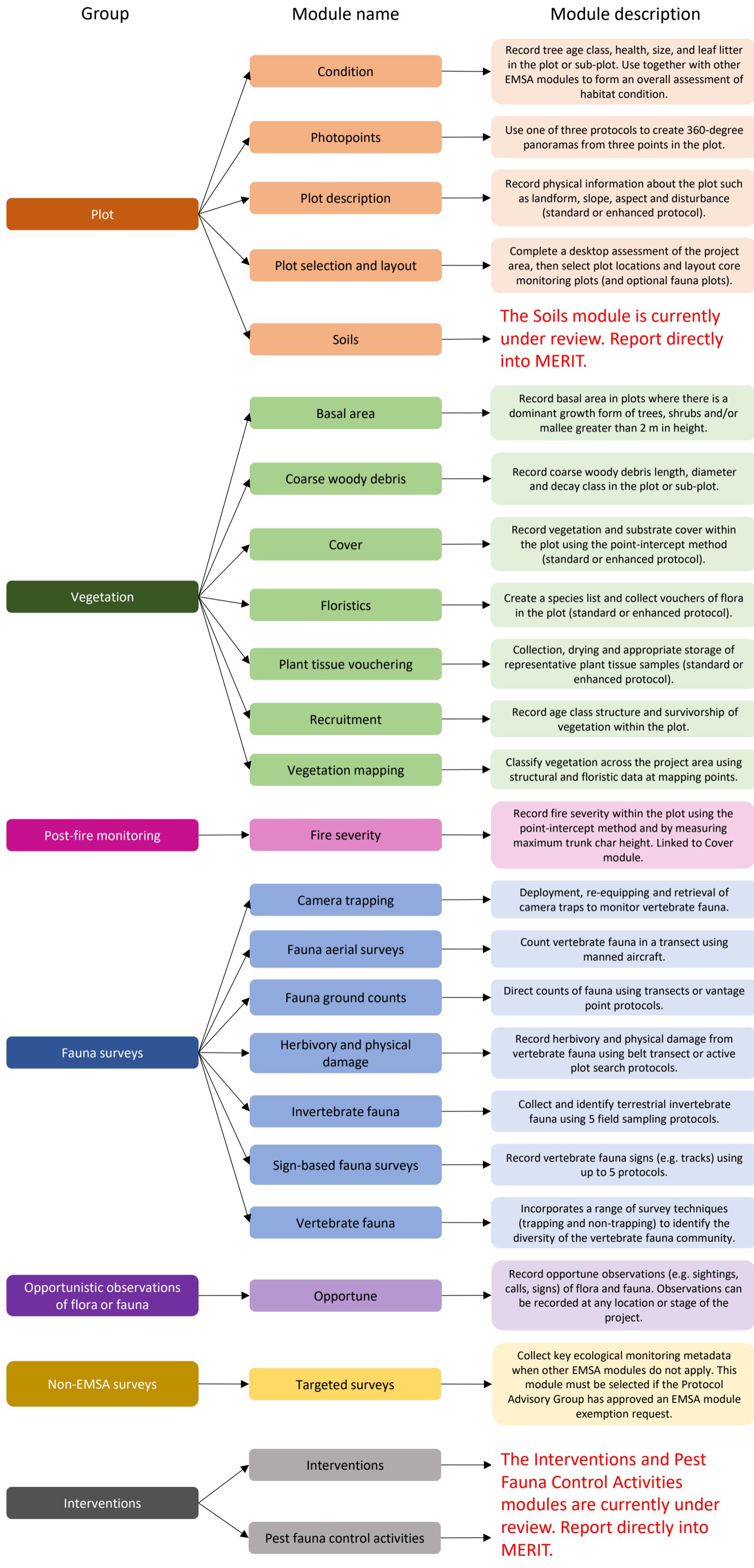
- Refer to this table (download separately) for a detailed overview of all EMSA modules.
- This Excel spreadsheet includes the module name, a paragraph description of the module and data captured, presence of protocol levels (standard or enhanced), if the module is linked to the Plot selection and layout module, links to other EMSA modules, recommended number of personnel per protocol, and estimated time requirements for each protocol.

## **EMSA module selection template and example Threatened Ecological Community case study**

- Refer to these PowerPoint slides (download separately) for an interactive module selection template and example project case study.
- The first slide provides a template for module selection in an NHT project. It outlines project development in 7 steps and lists all MERIT project services and EMSA modules. The second slide is a case study of a completed module selection template for a project mitigating new and established threats in a fictitious Threatened Ecological Community.



## EMSA module groups and descriptions





## Modules with all protocols linked to a plot

Plot selection and layout

Basal area

Coarse woody debris

Condition

Cover

Fire severity

Floristics

Invertebrate fauna

Photopoints

Plant tissue vouchering

Plot description

Recruitment

Soils module under review

## Modules with at least one protocol linked to a plot\*

Camera trapping

Herbivory and physical damage

Sign-based fauna surveys

Vertebrate fauna

\*Other protocols in these modules can be completed without a linked plot

## Modules with protocols that do not require a linked plot

Fauna aerial surveys

Fauna ground counts

Interventions module under review

Opportune

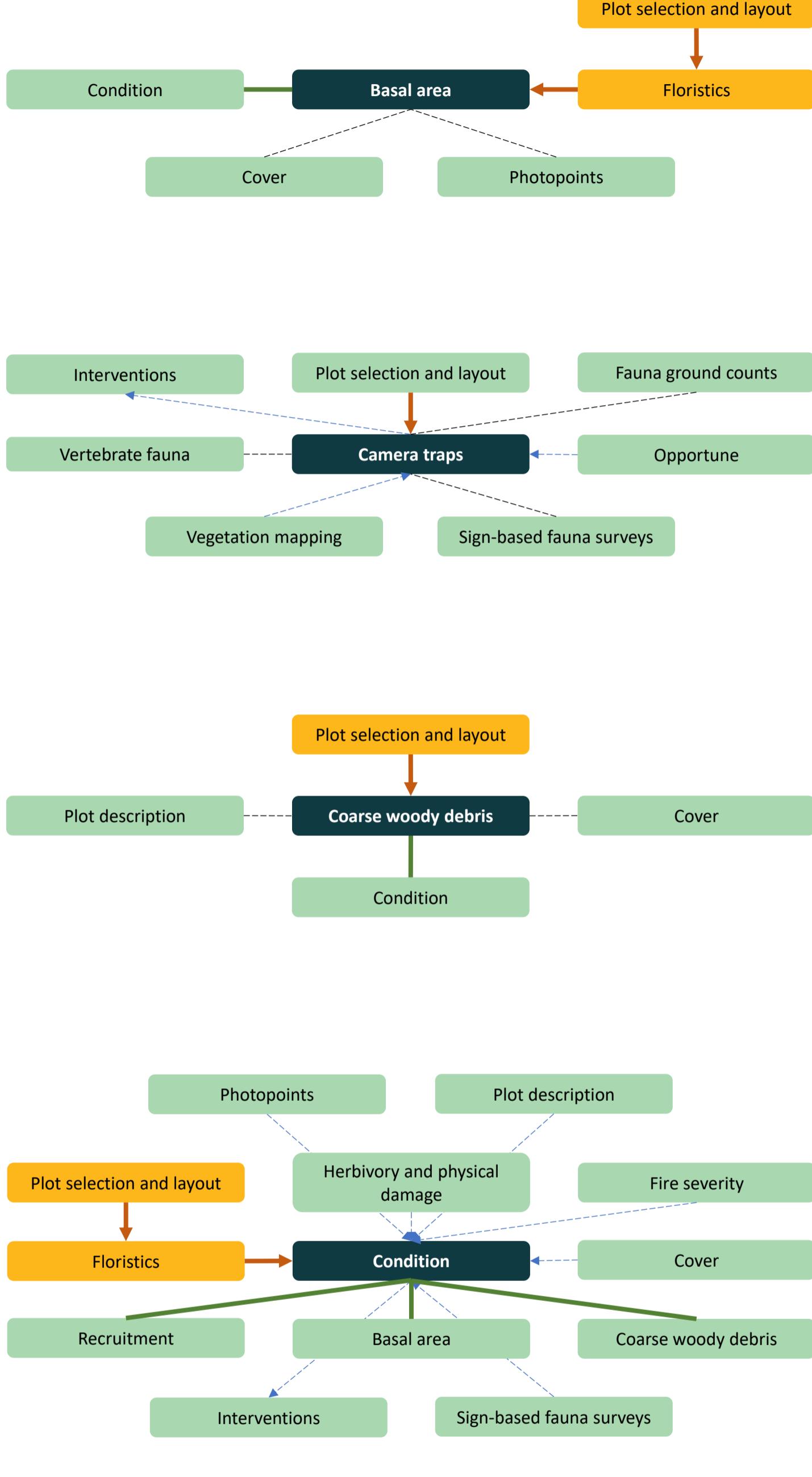
Pest fauna control activities module under review

Targeted surveys

Vegetation mapping



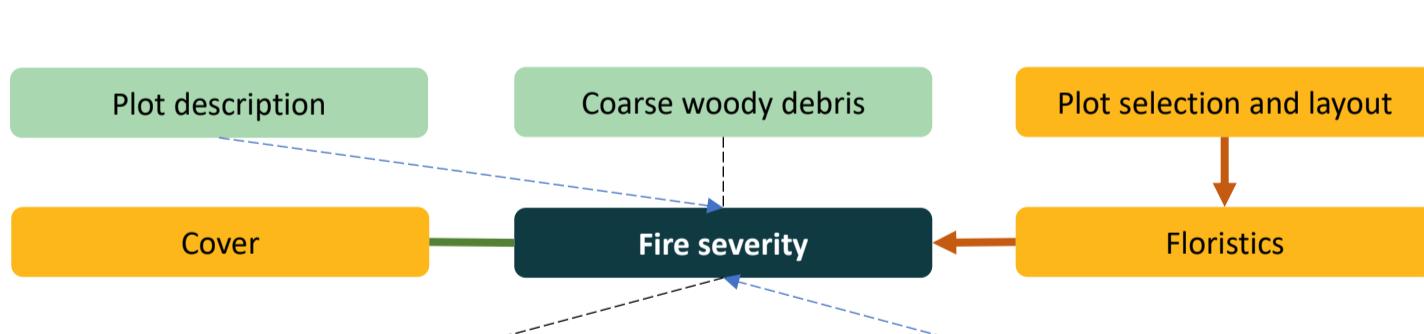
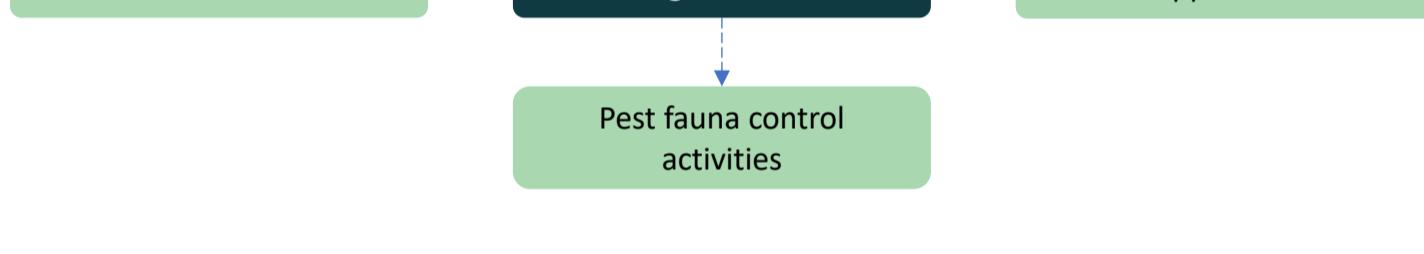
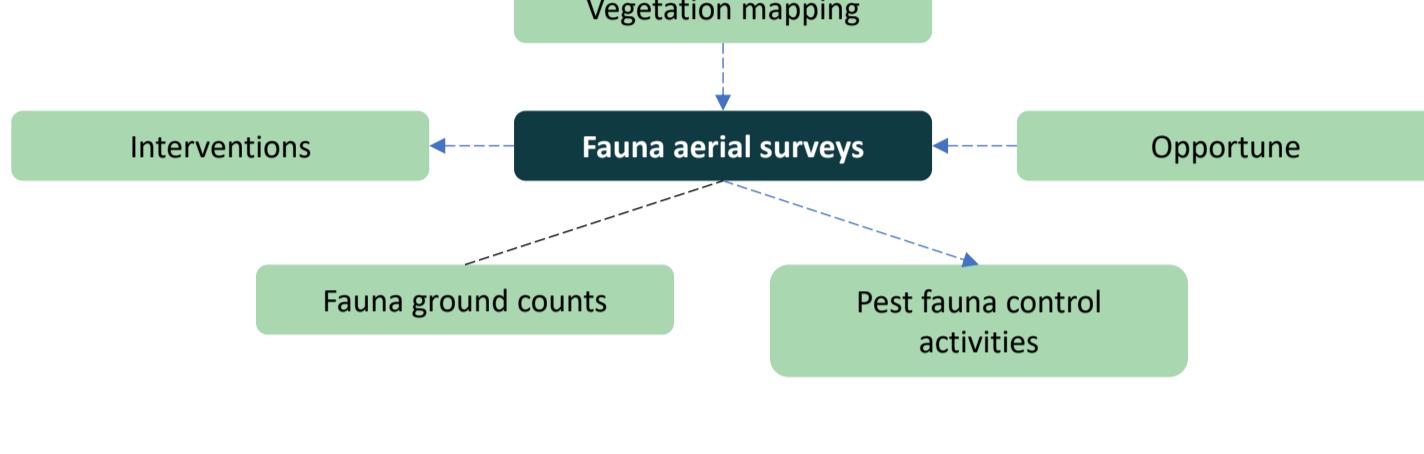
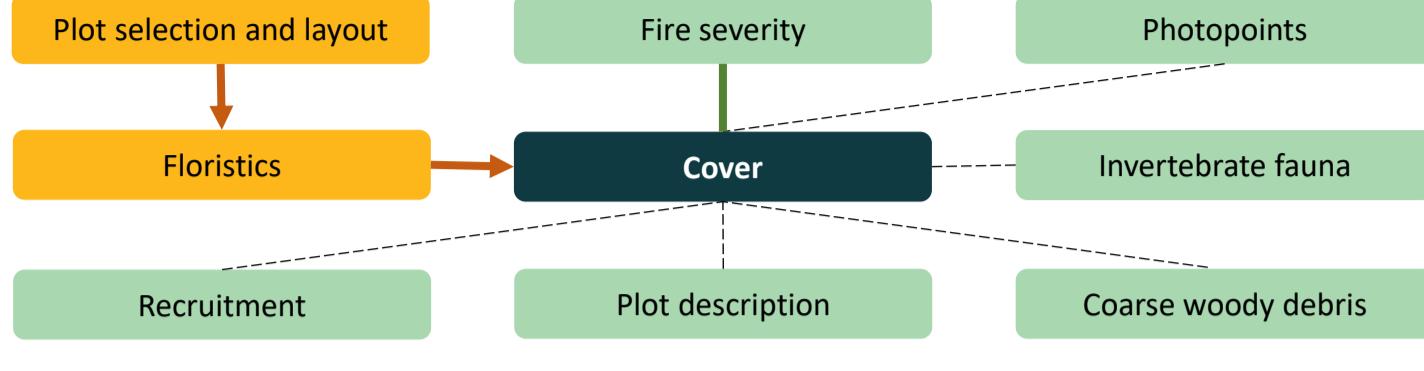
## EMSA module links and dependencies



Key:

- Yellow tiles: mandatory modules
- Light green tiles: optional modules
- ← Orange solid line with arrow: One module must be completed before the other
- Green solid line: Complete modules concurrently
- Black dashed line: Modules are complementary, may be completed concurrently
- ←----- Blue dashed line with arrow: One module informs the other

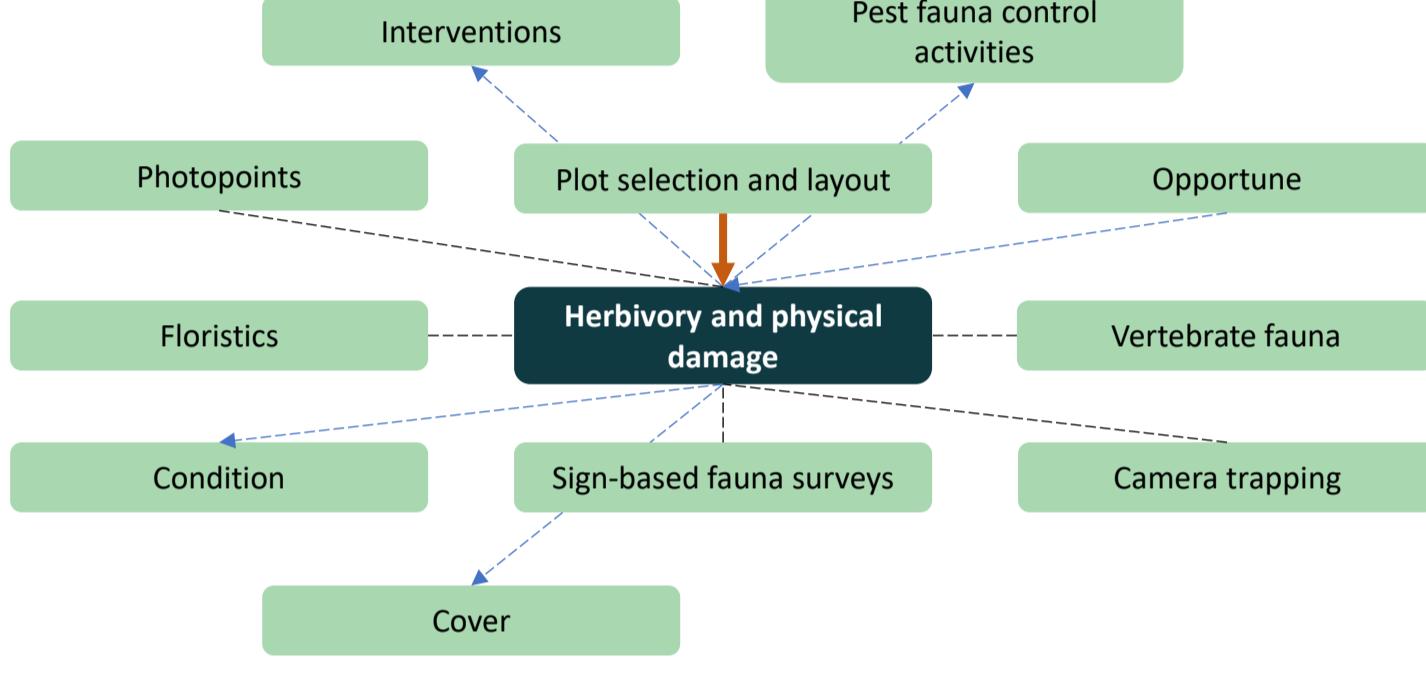
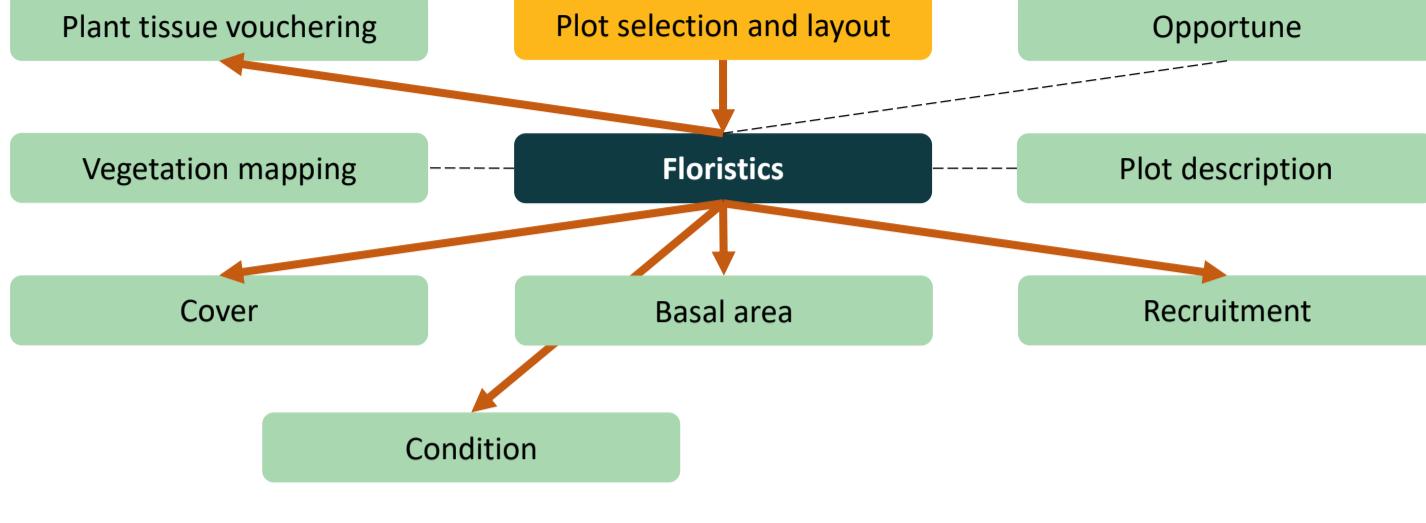
## EMSA module links and dependencies



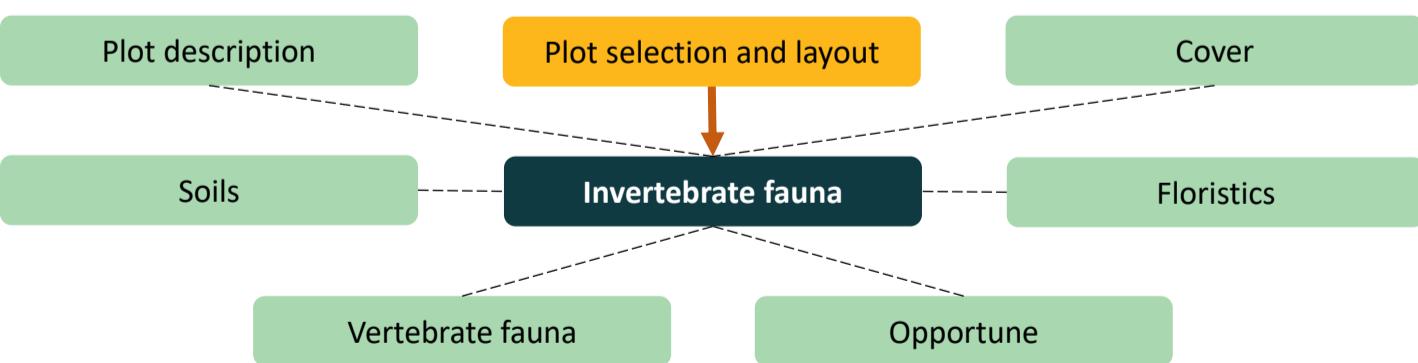
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## EMSA module links and dependencies



The Interventions module is currently under review.  
 Report directly into MERIT.

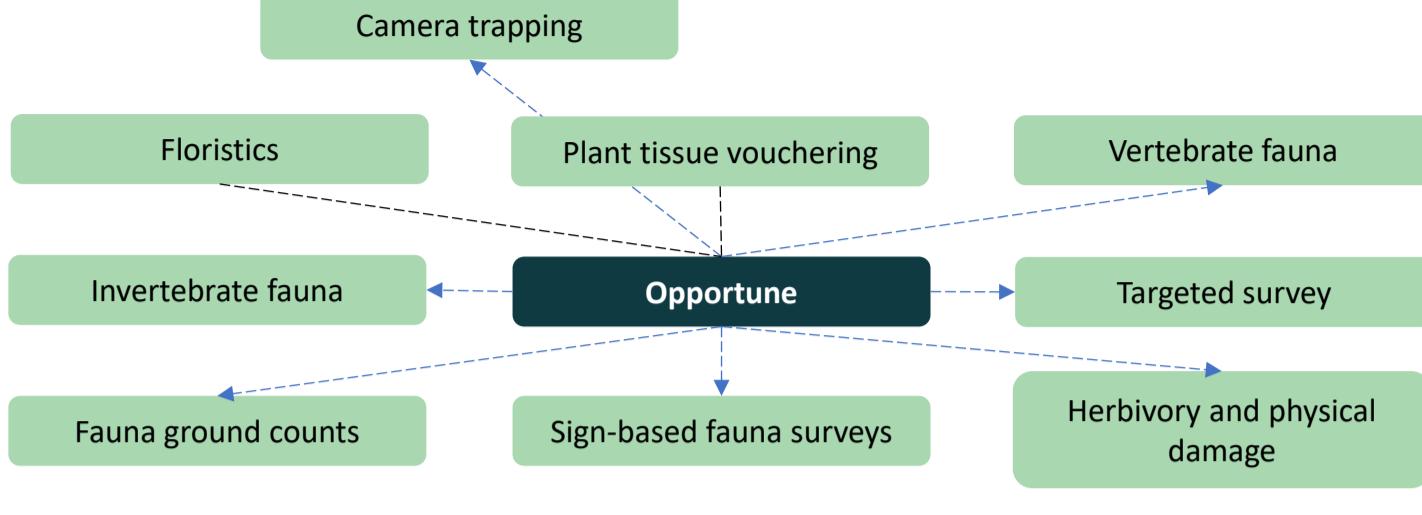


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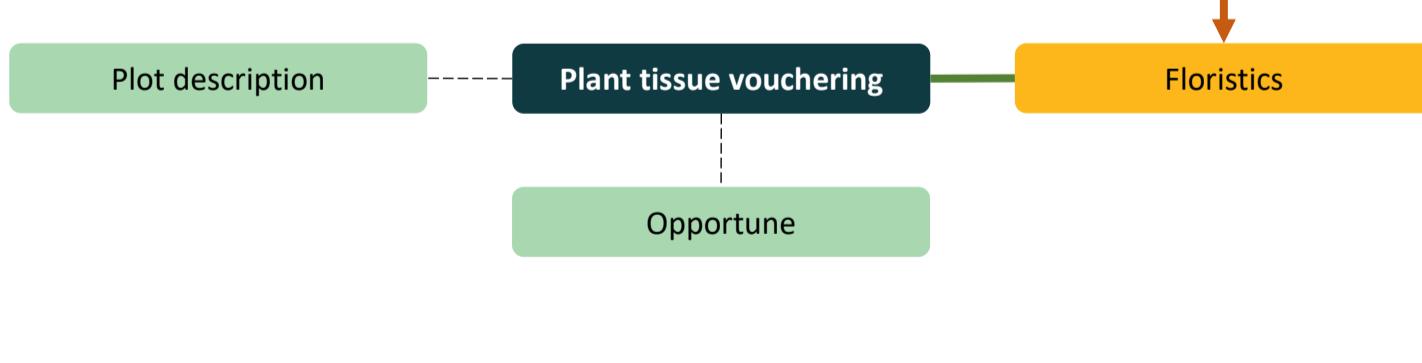
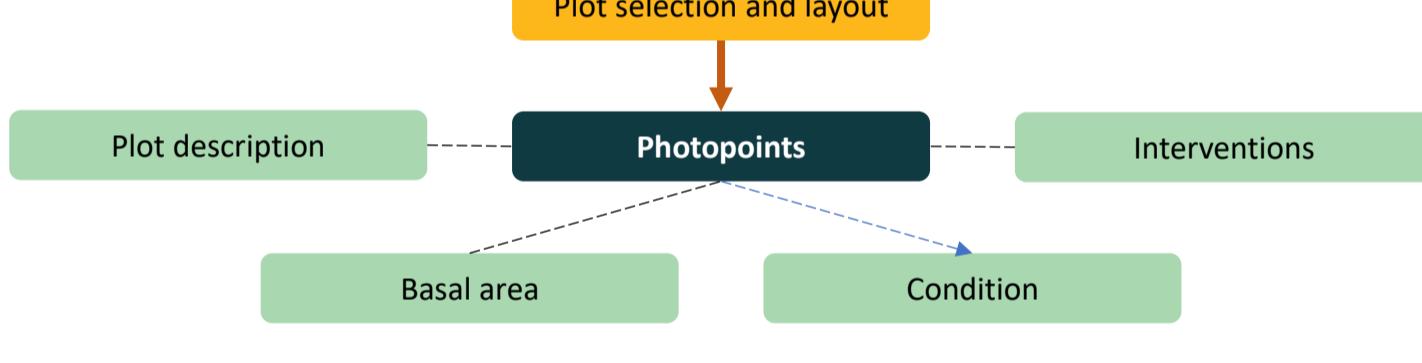
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## EMSA module links and dependencies



The Pest fauna control activities module is currently under review. Report directly into MERIT.

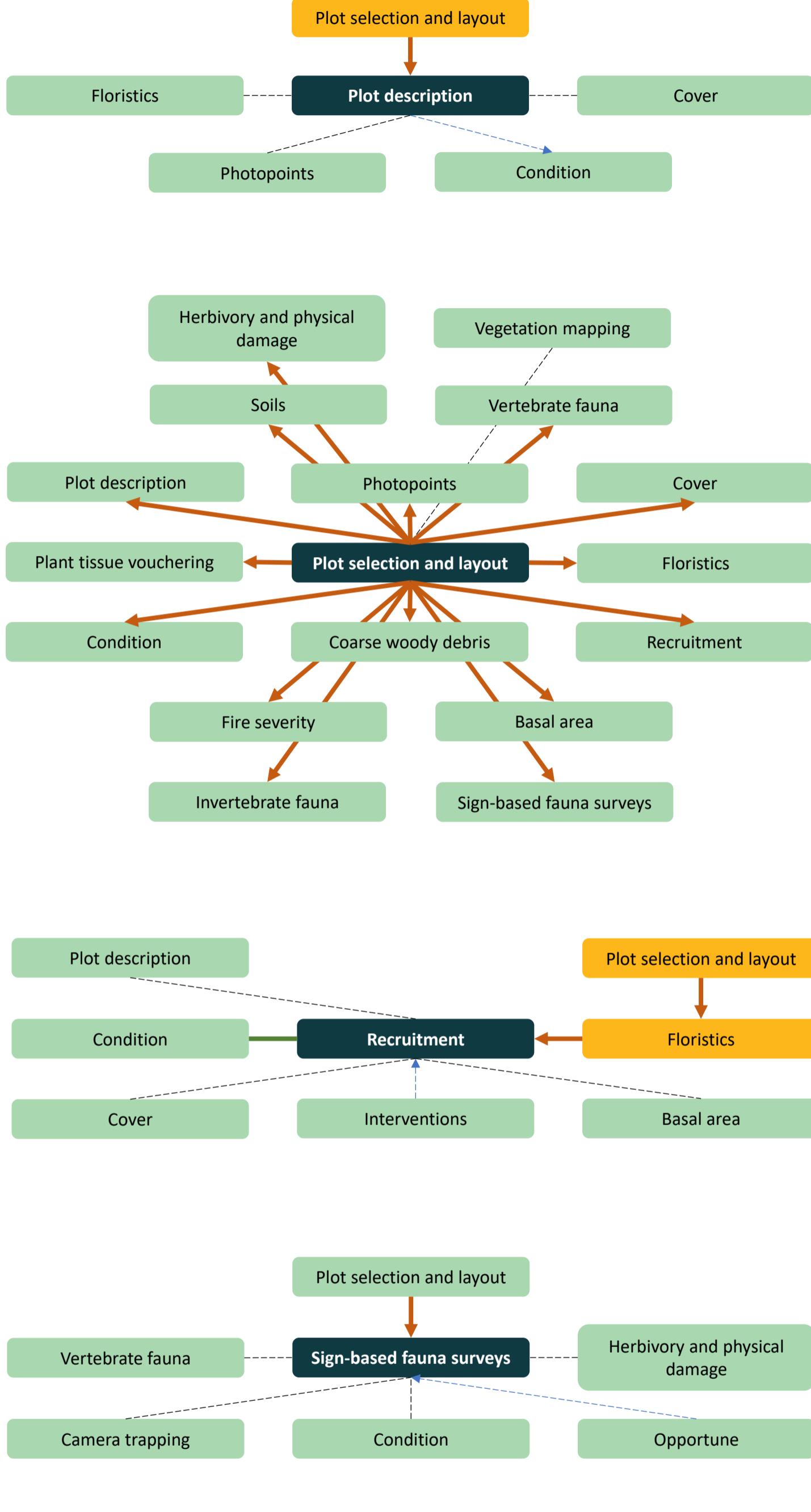


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## EMSA module links and dependencies



### Key:

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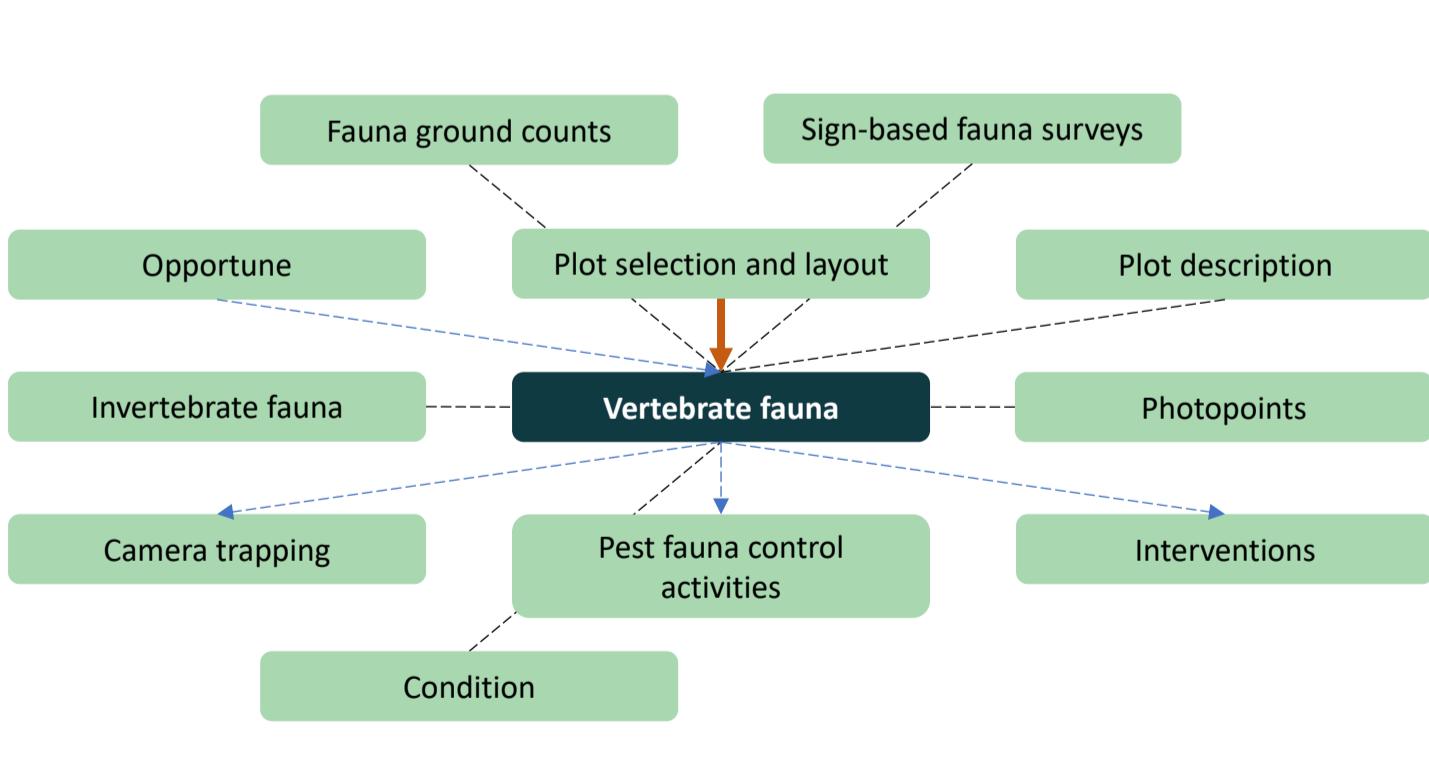
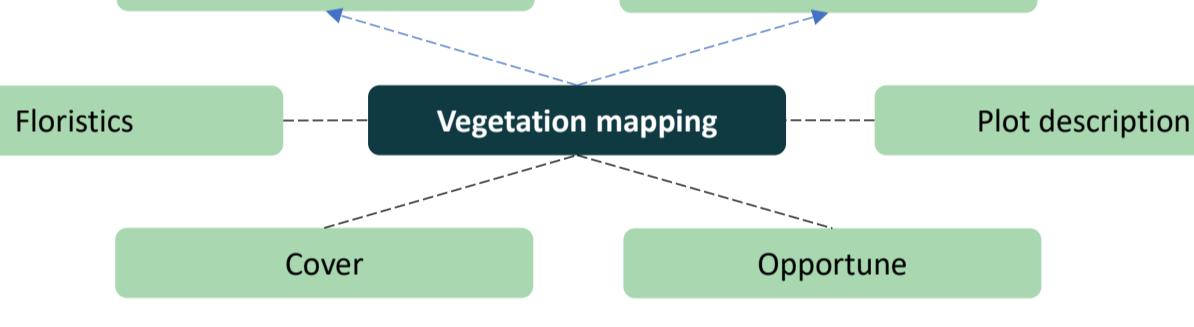


## EMSA module links and dependencies

The Soils module is currently under review. Report directly into MERIT.

### Targeted surveys

There are no links or dependencies. The Targeted Surveys module is used for the collection of key ecological monitoring metadata when other EMSA modules do not apply.



### Key:

- Yellow tile: mandatory modules
- Light green tiles: optional modules
- Orange solid line with arrow: One module must be completed before the other
- Green solid line: Complete modules concurrently
- Black dashed line: Modules are complementary, may be completed concurrently
- Blue dashed line with arrow: One module informs the other



# MERIT project services and associated EMSA modules

## Report directly into MERIT

Project services with no associated EMSA modules. Report directly into MERIT.

Communication materials	PSP project support and overheads
Community/stakeholder engagement	Skills and knowledge survey
Establishing and implementing conservation agreements	Sustainable agriculture facilitators
Farm management survey	Synthesising and finalising baseline data
First Nations Australians cultural practices	Water quality survey
Identifying and prioritising the location of potential sites	

### Key

- Dark purple, dark green or red tile with white text: MERIT project service
- Green tile with white text: recommended module
- Light green tiles with black text: select at least one module, depending on monitoring requirements and anticipated project outcomes
- White tile: optional module

## Surveys

Project services with recommended and optional EMSA modules for monitoring

Fauna survey	Flora survey	Habitat condition assessment survey	Pest animal survey	Seed germination/plant survival survey	Soil testing	Weed distribution survey
Camera trapping	Plot selection and layout	Plot selection and layout	Camera trapping	Plot selection and layout	Plot selection and layout	Vegetation mapping
Fauna aerial surveys	Floristics	Floristics	Fauna aerial surveys	Floristics	Soils module under review	Cover
Fauna ground counts	Basal area	Plot description	Fauna ground counts	Plot description		Floristics
Herbivory and physical damage	Cover	Photopoints	Herbivory and physical damage	Recruitment		Plot selection and layout
Invertebrate fauna	Plant tissue vouchering	Recruitment	Plot selection and layout	Cover		
Plot selection and layout	Plot description	Basal area	Sign-based fauna surveys	Photopoints		
Sign-based fauna surveys	Photopoints	Coarse woody debris		Vegetation mapping		
Vertebrate fauna	Vegetation mapping	Condition				

## Additional modules

Opportune	Record opportune observations (e.g., sightings, calls, signs) of flora and fauna.
Targeted surveys	Collect key ecological monitoring metadata <u>when other EMSA modules do not apply</u> .

Project services for which the Interventions module is recommended. **Note: the Interventions module is currently under review. Report directly into MERIT.**

Captive breeding, translocation or re-introduction programs	Improving land management practices
Mitigating disease	
Controlling access	
Controlling pest animals	Remediating riparian and aquatic areas
Removing weeds	
Debris removal	
Revegetating habitat	
Erosion management	
Seed collection and propagation	
Establishing and maintaining pest animal-free enclosures	
Site preparation	
Habitat augmentation	
Implementing fire management actions	
Undertaking emergency interventions to prevent extinctions	
Improving hydrological regimes for site eco-hydrology	

Project service for which the Pest fauna control activities module is recommended. **Note: the Pest fauna control activities module is currently under review. Report directly into MERIT.**

Controlling pest animals