



Natural
Resources
Commission

Review of *Catchment Action NSW*
funding allocation to Local Land
Services - 2015-16 and 2016-17

November 2014

Enquiries

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List of acronyms

LLS	Local Land Services
NRC	Natural Resources Commission
NSW	New South Wales

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1 Allocating *Catchment Action NSW* funding

Catchment Action NSW is the NSW Government's regionally-delivered project funding to address state natural resource management priorities. Following the establishment of Local Land Services in 2014, the Local Land Services Board of Chairs has asked the Natural Resources Commission (NRC) to review funding allocation best practice and identify options for the future allocation of funds within Local Land Services. This report sets out the NRC's final recommendations to Local Land Services.

1.1 Investor priorities

Catchment Action NSW is funded from the Waste and Environment Levy via the Minister for the Environment under a Funding Agreement with Local Land Services.

The Office of Environment and Heritage has indicated that the investment priorities ('funding themes') for this funding are:

- **native vegetation (including pests and weeds)** – 40 percent
- **biodiversity conservation** – 30 percent
- **threatened species** – 20 percent
- **Aboriginal cultural heritage** – 10 percent.

The Office of Environment and Heritage will provide written advice on the strategic priorities for the following financial year by 30 January each year. Local Land Services can vary the budget between the four Funding Themes by up to 10 percent each year.

1.2 Local Land Services investment principles

Initial consultation with the Local Land Services Senior Executive identified that the following investment principles should underpin the funding allocation process:

- 1 **maximise cost effectiveness and return on investment** – help Local Land Services get the most 'bang for their buck' at the state level
- 2 **invest in strategic priorities** – direct funding towards identified strategic investment priorities for *Catchment Action NSW* funding
- 3 **provide funding certainty and continuity for long-term planning** – funding continuity and certainty is a key governance principle supporting sustainable natural resource management (Davidson et al., 2008) – feedback from regional organisations indicates benefits from being able to develop long-term funding plans and strategies based on guaranteed budgets.

1.3 Recommended high-level allocation framework

Based on Local Land Services' investment principles, the NRC has developed a high level allocation framework for *Catchment Action NSW* funding (**Figure 1**).

80%	Fixed strategic investment	Allocation of funds towards fixed strategic investment priorities, as per the Funding Themes identified in the <i>Catchment Action NSW</i> Funding Agreement	Allocation fixed over multiple years to provide base-level funding continuity
20%	Flexible strategic investment	Allocation of funds towards flexible strategic investment priorities, state-scale priority projects and/or performance incentives	Allocation revised annually or biennially to reflect changing investor priorities and drive improved performance

Figure 1: High level assessment framework

The NRC is recommending that through the fixed strategic investment stream, the majority of the total funding quantum be allocated using a multi-criteria analysis assessment framework that addresses the four funding themes set out in the Funding Agreement (see **Section 2**). This funding stream should be fixed for at least the duration of Funding Agreement (until June 2017), and ideally for up to five years if the priorities within subsequent Funding Agreements remain unchanged. This will help provide Local Land Services with increased funding continuity, in line with Local Land Services’ third investment principle.

In contrast, a smaller proportion of funding should be allocated more frequently via a flexible strategic investment stream. The NRC recommends this assessment stream be revised annually or biennially to address any new investor priorities that may emerge, to fund state-scale priority projects in line with Funding Themes or to provide performance incentives in targeted areas. Improved Local Land Services performance will result in more cost-effective investment and better outcomes against the Funding Themes.

Box 1: Options for varying proportion of fixed versus flexible funding

The 80:20 ratio between the fixed and flexible strategic allocation streams has been proposed in order to give a reasonable funding pool for strategic investment, while still providing funding continuity through the larger fixed investment priorities stream.

Should Local Land Services wish to vary the allocation of funds to specific priorities within the flexible strategic investment stream then the following options are possible:

Option	Split	Year	Fixed strategic priorities	Flexible strategic priorities
1	90:10	2015-16	\$22.95 million	\$2.55 million
		2016-17	\$22.5 million	\$2.5 million
2	80:20	2015-16	\$20.4 million	\$5.1 million
		2016-17	\$20 million	\$5 million
3	70:30	2015-16	\$17.85 million	\$7.65 million
		2016-17	\$17.5 million	\$7.5 million

The 80:20 split was also proposed in the context of the current funding quantum being approximately \$25 million per year. Should the funding quantum change significantly, the split between the fixed and flexible strategic allocation streams will need to be reconsidered.

2 Allocating the fixed strategic investment stream

Multi-criteria analysis is a flexible approach that allows decision makers to develop an assessment framework that reflects their specific investment priorities and draw on best available state-wide information from multiple sources. **Figure 2** outlines a general multi-criteria analysis process.

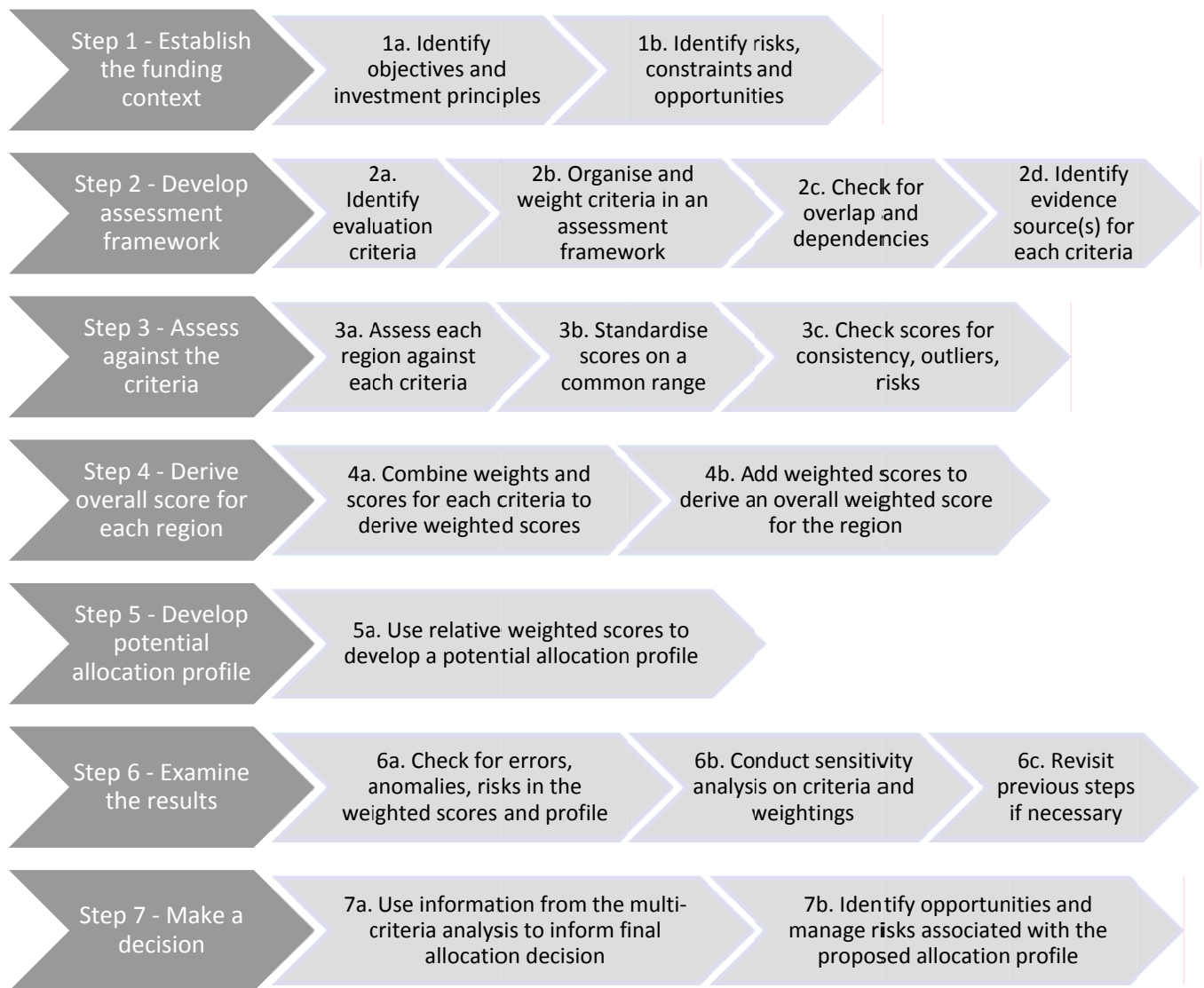


Figure 2: Multi-criteria analysis process (adapted from Department for Communities and Local Government, 2009 and Hajkowicz & Collins, 2007)

2.1 Developing a multi-criteria analysis assessment framework

The NRC has developed a multi-criteria assessment framework for fixed strategic priorities, including evaluation criteria and evidence sources, which is shown in **Figure 3**.

The evaluation criteria used are guided by the four investment priorities for *Catchment Action NSW*, as listed in **Section 1.1**.

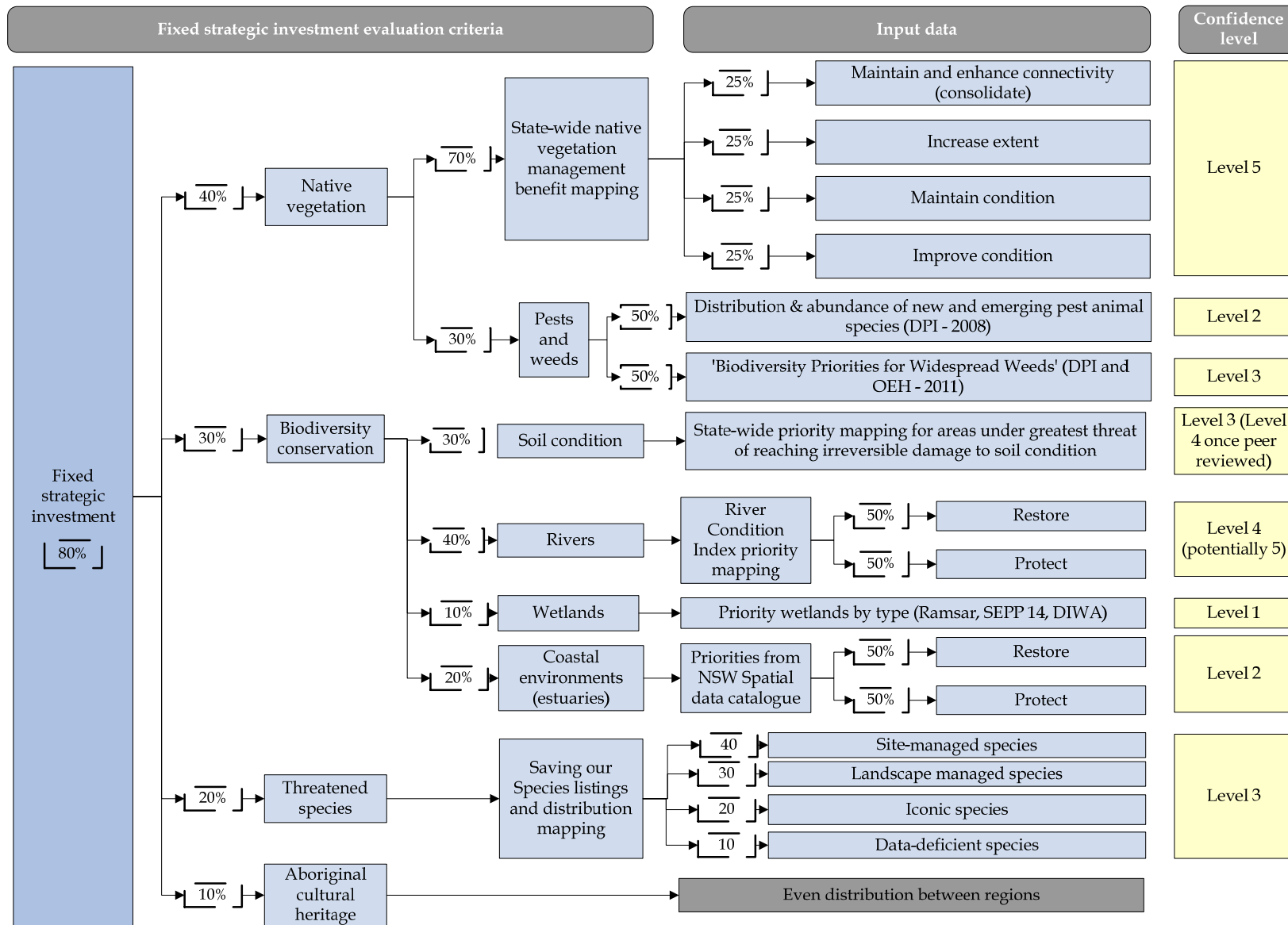


Figure 3: Assessment framework for strategic priorities stream

2.2 Using best available evidence for fixed investment priorities

The chosen input data represents the best available evidence. In the context of fixed strategic priorities, this means data that:

- is readily available across the state in a standardised form to allow comparison of regions
- is based on reproducible, quantitative datasets and scientific models
- is spatially-expressed
- incurs procurement and analysis costs commensurate to the funding being allocated.

Ideally, evidence to inform the strategic priorities assessment should be sourced from existing agency decision support tools and state-wide priority mapping, where available. These state-wide priority maps are important tools supporting collaboration and alignment of effort between state agencies, Local Land Services and other natural resource management stakeholders.

While these spatial products are ultimately owned by agencies, there are opportunities for regional bodies, such as Local Land Services, to have input into the development of these priority maps, both in the conceptual design of the mapping products and by providing regional data sets.

More information about the input data used in the assessment is provided in **Attachment 1**, while the investment priority maps are provided in **Attachment 2. Section 5.3** of this report discusses areas for improvement.

Box 2: Issues with native vegetation mapping in the Western Local Land Services Region

There are some significant data gaps underpinning the modelling used to develop the native vegetation priority mapping for the Western Local Land Services Region. The methodology for the spatial analysis of native vegetation priorities identifies limitations in predicting benefits in arid shrubland ecosystems, particularly given the lack of data on total grazing pressure.¹ This data gap limits the analysis of variations in condition across western landscapes, and as a result the area of arid vegetation types that require management is underestimated. This has been identified as a particular issue for the 'improve condition' priority mapping, and the associated criterion used in the NRC's multi-criteria analysis assessment framework for funding allocation.

The NRC is proposing that Western Local Land Services work with the Office of Environment and Heritage to improve the methodology within this region. However, this work is unlikely to be completed within the required timeframes for the 2015-16 allocation.

In the short term, the NRC has increased the Western Local Land Services score for the *native vegetation - improve condition* criterion from 1 to 2 to address the issues with underestimation of priority areas described in the mapping methodology.

In future allocation processes, scores should be updated to reflect the revised native vegetation priority mapping generated using an improved methodology, as developed by the Office of Environment and Heritage in collaboration with Western Local Land Services.

¹ Drieslma, MJ, Howling, G. and Love, J. (2012) *NSW Native Vegetation Management Benefits Analyses: Technical Report*. NSW Office of Environment and Heritage, Sydney, p. 6.

2.3 Assessing Local Land Services regions

Following Steps 3 and 4 of the multi-criteria analysis process shown in **Figure 2**, the NRC has used best available data to assess each region against the assessment criteria, resulting in comparative scores on a five-point scale for each criterion. The scores reflect the relative investment priority for each region for a given criterion, and are provided in **Attachment 3**.

These scores are weighted according to the weightings shown in **Figure 3**, and are then added together. The total weighted score for each region is used to inform the development of the allocation profile in **Section 4**.

3 Allocating the flexible strategic investment stream

3.1 Potential flexible strategic investment options

The flexible strategic investment stream allows Local Land Services to allocate a proportion of *Catchment Action NSW* funding in response to changing or emerging strategic priorities or to address identified risks. Potential allocation objectives are explored in **Table 1**.

Table 1: Allocation of the flexible strategic investment stream

Allocation objectives	Example priorities/criteria/evidence sources
Allocation of funds to new investor priorities or state-scale priority projects	<ul style="list-style-type: none"> ▪ Emerging natural resource issues identified by Minister for the Environment or Minister for Primary Industries ▪ State-scale projects that are aligned with the Funding Themes, for example: <ul style="list-style-type: none"> - implementing innovative state-scale practices - projects that will improve Local Land Services' state-wide organisational capacity in relevant areas (for example, state-wide monitoring, evaluation and reporting programs) - significant multi-region collaborative projects ▪ Responses to natural disasters that are aligned with the Funding Themes
Use of performance metrics to drive improved performance, manage organisational risk, and direct investment towards regions with proven high performance	<ul style="list-style-type: none"> ▪ Ability of Local Land Services to leverage external funding across the four Funding Themes (measured by quantity of external investment and co-contributions) ▪ Measures of community engagement, collaboration and partnerships ▪ Effectiveness of Local Land Services strategic plan implementation (measured through performance audits) ▪ Quality of regional strategic planning (measured through regional plan assessments).

Overall, the allocation of this funding stream will be at the discretion of Local Land Services, including the quantum of funding directed towards each flexible priority. For example, if Local Land Services wish to allocate less than the full 20 percent of funding towards flexible priorities, then the remaining portion of funds can either be allocated evenly between regions, or in accordance with the regional proportional allocations determined within the fixed strategic priorities assessment.

3.2 Potential evidence and data sources

Evidence around performance metrics could be sourced from internal Local Land Services reporting, independent accountability processes such as external performance audits, and reviews of cost effectiveness and return on investment undertaken by Local Land Services, agencies or academics. For example, performance metrics may include key performance indicators within the Local Land Services State Strategic Plan.

As Local Land Services were only established in 2014, the NRC recognises that data for some performance metrics may not yet be available. In these instances, Local Land Services should prioritise the collection of state-wide performance data in line with the Local Land Services State Strategic Plan.

However, information about the ability of Local Land Services to attract external funding across the four Funding Themes could potentially be found within the 2014-15 financial accounts. This metric could be used to manage organisational risks around long-term funding security, as well as promoting increased third party investment in identified strategic natural resource management priorities.

3.3 Allocating the flexible strategic investment stream in 2015-17

The allocation of the flexible strategic investment stream depends on the investment priorities identified by Local Land Services. At present, Local Land Services have not indicated specific investment priorities for 2015-16 or 2016-17.

In the absence of specific priorities, the NRC has modelled a default option whereby the flexible strategic investment stream is allocated in line with the profile developed for the fixed strategic investment stream.

The NRC can work with Local Land Services to develop current and future flexible strategic investment priorities, if required.

4 Recommended allocation profile

The NRC's recommended allocation profile is presented in **Figure 4** and **Table 2**. This profile is generated using an excel model based on the multi-criteria analysis assessment framework in **Figure 2** and the scores provided in **Attachment 3**.

The profile is based on a total funding quantum of \$25.5 million in 2015-16 and \$25 million in 2016-17², meaning there is a decrease of \$3.5 million between the 2015-16 allocation and the \$29 million allocation provided in 2014-15.

A summary of the factors driving each region's proportional allocation is provided in **Table 3**. This region by region summary will help Local Land Services understand why their proportional allocation may have changed compared with their 2014-15 allocation. Drivers of change and the risks associated with funding fluctuations are discussed further in the next section of this briefing.

² As per the Funding Agreement between Office of Environment and Heritage and Local Land Services for *Catchment Action NSW* funding.

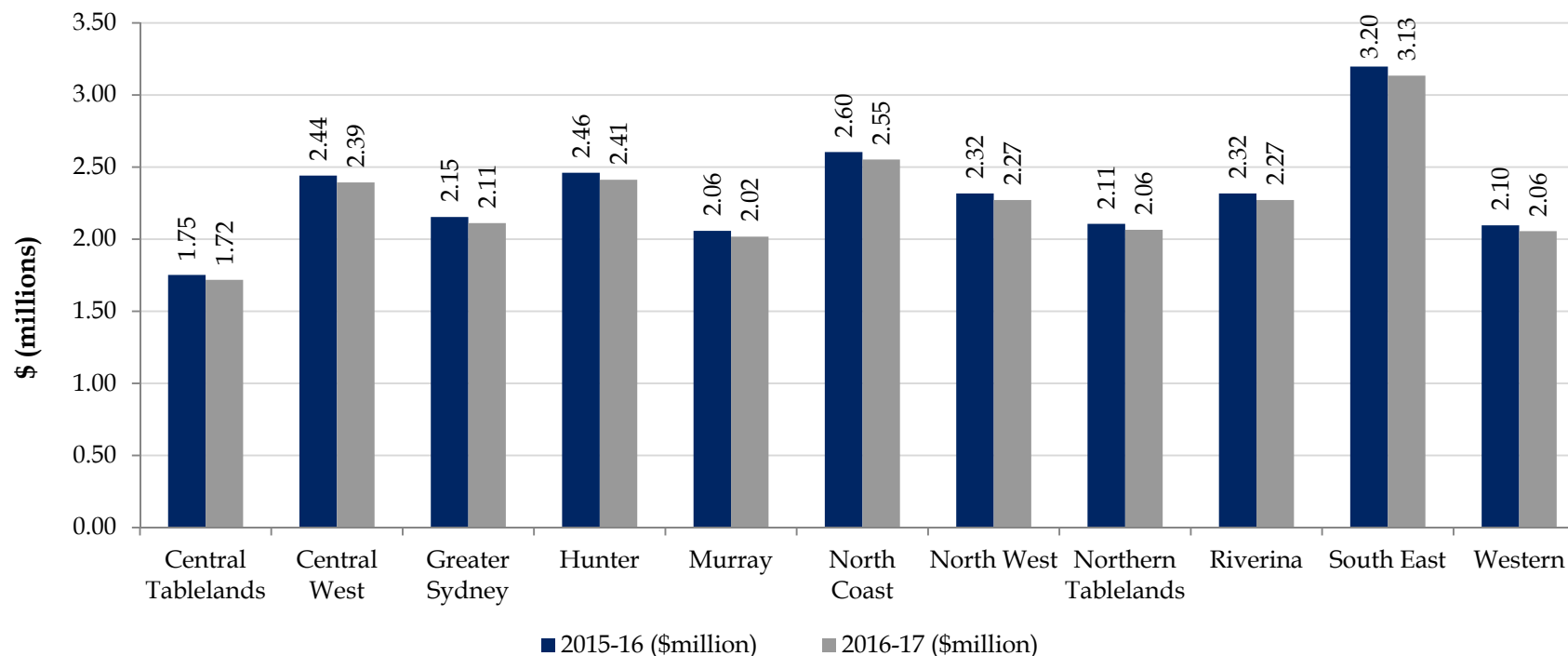


Figure 4: Allocation profile for *Catchment Action* NSW funding to Local Land Services 2015-16 and 2016-17 (assuming all funds are allocated in line with the profile developed for the fixed strategic investment stream)

Table 2: Summary figures for allocation of *Catchment Action* NSW funding to Local Land Services 2015-16 and 2016-17

		Central Tablelands	Central West	Greater Sydney	Hunter	Murray	North Coast	North West	Northern Tablelands	Riverina	South East	Western	Total
Percentage %		6.87%	9.57%	8.45%	9.65%	8.07%	10.21%	9.08%	8.26%	9.08%	12.54%	8.22%	100%
2015-16 (\$million)	100%	1.75	2.44	2.15	2.46	2.06	2.60	2.32	2.11	2.32	3.20	2.10	25.5
	80%	1.40	1.95	1.72	1.97	1.65	2.08	1.85	1.68	1.85	2.56	1.68	20.4
2016-17 (\$million)	100%	1.72	2.39	2.11	2.41	2.02	2.55	2.27	2.06	2.27	3.13	2.06	25.0
	80%	1.37	1.91	1.69	1.93	1.61	2.04	1.82	1.65	1.82	2.51	1.64	20.0

Table 3: Key factors driving proposed regional proportional allocations

Region	What is driving the region's proposed proportional allocation?
Central Tablelands	<ul style="list-style-type: none"> ▪ Removal of previously very high performance score for <i>plans for investment</i> from framework ▪ High score for <i>soil</i>, but lower weighting for this criterion within the new investment framework ▪ Minor decrease in weeds score following change of data source ▪ Medium to low scores for the new <i>threatened species</i> criteria ▪ Low scores for other criteria in fixed strategic investment stream
Central West	<ul style="list-style-type: none"> ▪ Removal of previously very high performance score for <i>plans for investment</i> from framework ▪ High score for <i>soil</i>, but lower weighting for this criterion within the new investment framework ▪ Decrease in weeds score following change of data source ▪ High scores for <i>native vegetation (increase extent and improve condition)</i> ▪ Medium scores for <i>wetlands, native vegetation (connectivity and maintain condition)</i> and <i>threatened species (iconic)</i> ▪ Low scores for <i>pest animals, weeds</i> and three of the four the new <i>threatened species</i> criteria
Greater Sydney	<ul style="list-style-type: none"> ▪ High scores for three of the four new <i>threatened species</i> criteria ▪ Removal of previously low score for <i>plans for investment</i> from framework ▪ Increase in weeds score following change of data source ▪ Generally low scores across <i>native vegetation</i> and <i>biodiversity conservation</i>
Hunter	<ul style="list-style-type: none"> ▪ High scores for <i>soil</i>, but lower weighting for this criterion in the new investment framework ▪ Medium to high scores in the new <i>threatened species</i> criteria ▪ Minor decrease in weeds score following change of data source ▪ High scores for <i>rivers (restore)</i> and <i>wetlands</i> ▪ Medium scores for <i>native vegetation (connectivity)</i> and <i>pest animals</i> ▪ Low scores for other criteria in the fixed strategic investment stream ▪ Removal of medium score for <i>plans for investment</i>
Murray	<ul style="list-style-type: none"> ▪ Removal of previously very high performance score for <i>plans for investment</i> from framework ▪ Low scores for the of the four new <i>threatened species</i> criteria, and other criteria in the fixed strategic investment stream ▪ Minor decrease in weeds score following change of data source ▪ High scores for <i>rivers (restore)</i> and <i>wetlands</i> ▪ Medium scores for <i>native vegetation (increase extent)</i>, and <i>pest animals</i>
North Coast	<ul style="list-style-type: none"> ▪ High scores for three of the four new <i>threatened species</i> criteria, <i>rivers (restore)</i> and <i>estuaries (protect)</i>. ▪ Retains high <i>weeds</i> score following change of data source ▪ Removal of previously high performance score for <i>plans for investment</i> from framework ▪ Medium scores for <i>soil, native vegetation (connectivity)</i> and <i>estuaries (restore)</i> ▪ Low scores for other criteria in the fixed strategic investment stream

Region	What is driving the region's proposed proportional allocation?
North West	<ul style="list-style-type: none"> ▪ Removal of previously very high performance score for <i>plans for investment</i> from framework ▪ Low scores for three of the four new <i>threatened species</i> criteria, and other criteria in the fixed strategic investment stream ▪ High scores for <i>soils</i>, but lower weighting for this criterion within the new investment framework ▪ Decrease in weeds score following change of data source ▪ High scores for <i>native vegetation (connectivity, maintain condition)</i> and <i>rivers (restore)</i>
Northern Tablelands	<ul style="list-style-type: none"> ▪ Removal of previously very high performance score for <i>plans for investment</i> from framework ▪ Medium to low scores for the new <i>threatened species</i> criteria ▪ High scores for <i>soils</i>, but lower weighting for this criterion within the new framework ▪ Decrease in weeds score following change of data source ▪ High scores for <i>native vegetation (connectivity)</i> and <i>pest animals</i> ▪ Low scores for other criteria in the fixed strategic investment stream
Riverina	<ul style="list-style-type: none"> ▪ High scores for <i>soils</i>, but lower weighting for this criterion within the new framework ▪ Low scores for three of the four new <i>threatened species</i> criteria, and other criteria in the fixed strategic investment stream ▪ Decrease in weeds score following change of data source ▪ High scores for <i>native vegetation (increase extent)</i> and the new <i>iconic threatened species</i> criterion ▪ Medium score for <i>rivers (restore)</i> ▪ Removal of medium performance score for <i>plans for investment</i> from framework
South East	<ul style="list-style-type: none"> ▪ Removal of previously very high performance score for <i>plans for investment</i> from framework ▪ High scores for three of the four new <i>threatened species</i> criteria, <i>native vegetation (connectivity)</i>, <i>estuaries</i> and <i>pest animals</i> ▪ High scores for <i>soils</i>, but lower weighting for this criterion within the new investment framework ▪ Minor decrease in weeds score following change of data source ▪ Medium scores for <i>rivers (protect)</i> and the new <i>threatened species (iconic)</i> criterion ▪ Low scores for other criteria in the fixed strategic investment stream
Western	<ul style="list-style-type: none"> ▪ Removal of previously high performance score for <i>plans for investment</i> from framework ▪ Low scores for two of the four new <i>threatened species</i> criteria ▪ Decrease in weeds score following change of data source ▪ High scores for <i>native vegetation (maintain condition)</i>, <i>rivers (protect)</i>, <i>wetlands</i> and for the new <i>data deficient threatened species</i> criterion ▪ Medium scores for <i>rivers (restore)</i> and the new <i>iconic threatened species</i> criterion ▪ Low scores for other criteria in the fixed strategic investment stream

5 Risks associated with the recommended profile

A key stage in the multi-criteria analysis process is the identification and management of risks associated with the proposed allocation profile.

5.1 Comparison with the 2014-15 funding profile

A key risk within the funding allocation process is funding continuity from year to year. Changes to regional project funding may undermine project outcomes and community engagement. **Figure 5** compares:

- the NRC's recommended allocation profile for 2014-15
- Local Land Services' actual allocation profile for 2014-15
- proposed Local Land Services' allocation profile for 2015-16.

Figure 5 and **Table 4** show there is potential for significant funding fluctuations between 2014-15 and 2015-16, particularly in the North West, Western, Greater Sydney, South East and Central Tablelands Local Land Services regions.

The following factors are major contributors to overall differences between the allocations for 2014-15 and proposed allocations for 2015-17:

- one-off transitional funding arrangements in 2014-15 implemented by Local Land Services to ease the transition from Catchment Management Authorities to Local Land Services and the associated boundary changes
- a decrease in absolute funding quantum (funding decreases from \$29 million in 2014-15 to \$25.5 million in 2015-16 and \$25 million in 2016-17)
- changed investor priorities leading to a new assessment framework, new assessment criteria, altered criteria weightings and new data inputs (for example, the addition of threatened species as a new investment priority)
- removal of performance data from the assessment framework
- different input data for weeds assessment criteria.

Based on the information presented in **Table 4**, North West Local Land Services is likely to incur the largest reduction in funding (a decrease of \$1.24 million), followed by Western Local Land Services (a decrease of \$0.78 million).

North West and Western Local Land Services previously gained a significant funding increase under Local Land Services transitional arrangements, while also benefiting from high performance scores under the previous funding model. Their allocation for 2015-16 has been impacted by the removal of performance metrics from the framework, as well as lower scores for new investment priorities and datasets such as threatened species and weeds.

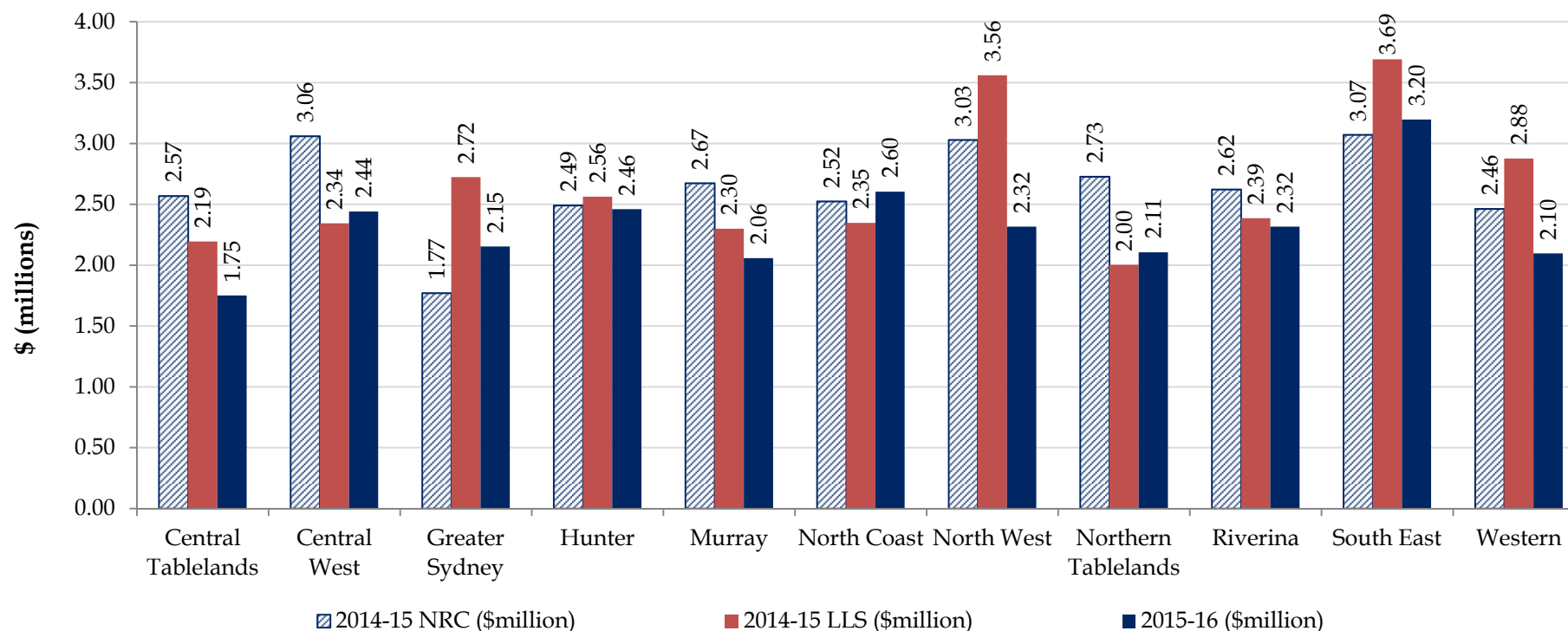


Figure 5: Comparison of past and proposed funding profiles

Table 4: Comparison of past and proposed funding profiles

	Central Tablelands	Central West	Greater Sydney	Hunter	Murray	North Coast	North West	Northern Tablelands	Riverina	South East	Western	Total
2014-15 (NRC) (\$million)	2.57	3.06	1.77	2.49	2.67	2.52	3.03	2.73	2.62	3.07	2.46	29
2014-15 (LLS) (\$million)	2.19	2.34	2.72	2.56	2.30	2.35	3.56	2.00*	2.39	3.69	2.88	29
2015-16 (\$million)	1.75	2.44	2.15	2.46	2.06	2.60	2.32	2.11	2.32	3.20	2.10	25.5
Change (\$million)	-0.44	0.10	-0.57	-0.10	-0.24	0.25	-1.24	0.11	-0.07	-0.49	-0.78	-3.48

*NRC understands Northern Tablelands' total budget expenditure for 2014-15 was \$2.33 million, with \$0.33 million accounted for outside of Catchment Action NSW

5.2 Transitional funding arrangements

Given that the funding is being allocated over two financial years, there is some scope for implementing a two-stage transitional funding process for the Local Land Services region(s) at most risk due to funding shifts. For example, the transitional funding may be allocated from within the flexible priorities stream, if Local Land Services determines that these fluctuations present a significant organisational risk.

However, any transitional arrangements put in place must be carefully developed and implemented. Analysis of the profiles presented in **Figure 5** and **Table 4** indicates that previous transitional arrangements have exacerbated the likely funding fluctuations between 2014-15 and 2015-16, particularly for the North West and Western Local Land Services.

Note: Should Local Land Services choose to adopt a transitional funding arrangement, the NRC can adapt the decision support tool to generate a suitable transitional profile for 2015-16.

5.3 Data gaps and areas for improvement

The expected benefits of the use of state-wide spatial decision support tools to inform funding allocations include:

- encouraging greater spatial expression of investor preferences and priorities
- collaboration to support effective monitoring, evaluation and reporting and decision support systems in response to decision makers' needs at both regional and state scales
- increased objectivity and transparency when allocating funding between regions.

Although the NRC has used the best available information, **Table 5** shows that the assessment draws on information sources and decision rules of varying standards. Over time, agencies, Local Land Services and the NRC should work together to further develop and improve the data inputs.

Table 5: Hierarchy of information used in the funding allocation process

Standard of information	Assessment criteria	Characteristics of information
1 (lower)	Wetlands	<ul style="list-style-type: none"> ▪ State-wide and/or regional datasets, reports and/or indices ▪ NRC judgement and scoring
2	Estuaries Pest animals	<ul style="list-style-type: none"> ▪ State-wide population, distribution, and abundance mapping with indices ▪ NRC judgement and scoring
3	Soil and land management, weeds, threatened species	<ul style="list-style-type: none"> ▪ State-wide priority mapping and/or listings ▪ State-wide datasets and expert based decision rules ▪ Technical reports
4	Rivers	<ul style="list-style-type: none"> ▪ Level 3 with peer reviewed and/or published mapping or modelling tools and prioritisation processes/functions
5	Native vegetation	<ul style="list-style-type: none"> ▪ Level 4 with government or agency endorsed or publically available priority mapping and/or listings
6 (higher)	-	<ul style="list-style-type: none"> ▪ Level 5 with incorporating regional decision rules and preferences, including socio-economic values

The NRC has identified specific data gaps, as well areas for improvement within the allocation framework.

5.3.1 Weeds

While the biodiversity priorities for widespread weeds mapping is based on a sound prioritisation process and extensive collaboration, it is now several years old and reflects Catchment Management Authority priorities.

Local Land Services should consider revisiting the process for identifying biodiversity priorities for widespread weeds to create an up-to-date list of priority weed management sites. It would also be useful to record the total area covered by each project site, in addition to location coordinates.

5.3.2 Aboriginal cultural heritage

There is no spatially expressed data for state-scale Aboriginal cultural heritage priorities. In addition, consultation with Aboriginal representatives at the state and regional level did not identify any suitable metrics to inform the allocation of this proportion of *Catchment Action NSW* funding.

Local Land Services and state agencies may wish to work together to develop overarching investment principles or priorities now that Aboriginal cultural heritage is a specific investment theme under the *Catchment Action NSW* Funding Agreement.

5.3.3 Native vegetation

Although the native vegetation mapping is listed as being generally of a high standard, there are some issues around data gaps and recognition of east-west connectivity. As discussed in **Box 2** (page 6), Western Local Land Services has concerns about data gaps in their region. Hunter Local Land Services has also identified east-west connectivity as an area for improvement. Western and Hunter Local Land Services should work with the Office of Environment and Heritage to improve the methodology.

5.3.4 Threatened species

Spatial data is available for conservation projects under one of the four threatened species management streams – site-managed species. The Office of Environment and Heritage has not yet identified spatial priorities for the remaining management streams, though it is expected this work will be undertaken. For example, the Office of Environment and Heritage plans to overlay species distribution models with vegetation community associations to further refine investment priorities for threatened species, specifically landscape species from the Saving our Species program.

5.3.5 Soil

In 2013, the NRC commissioned the University of New England to identify priority areas for maintaining and improving soil condition. The spatial layer developed by the University of New England identifies areas that are reaching biophysical tipping points and are likely to cause irreversible damage to soil condition. This work was commissioned in response to a significant data gap in regional natural resource management.

This remains an important data set, particularly for Local Land Services. However, the NRC does not have the funding or capacity to own, update and manage this data set in the long term.

Local Land Services should consider taking custodianship of this dataset to inform their strategic planning. The methodology and mapping would also benefit from independent expert review.

5.3.6 Other areas for improvement

Local Land Services should generally seek opportunities to work with state agencies to develop and improve decision support tools for natural resource management. For example, most state-wide spatial priority mapping would benefit from incorporating more social, cultural and economic values and decision rules.

In particular, regional and state-wide datasets should be integrated to build state-scale information products. For example, the Biodiversity Priorities for Widespread Weeds mapping is based on regional information captured under the Catchment Management Authorities model. This relies on the development and consistent implementation of state-wide standards and protocols for information gathering and sharing.

Based on the standard of information indicated in **Table 5**, there is significant scope for improving the current data sets and priority mapping (and associated decision support tools, where relevant) for wetlands, estuaries and pest animals. For example, Local Land Services could work with the Department of Primary Industries to derive priorities for pest animal management using the new Biosecurity Information System. This system aims to provide access to current pest and weed data and mapping.

Agencies and Local Land Services should also explore how available information products can be integrated to improve decision-making, such as the integration of distribution models with vegetation community associations described in **Section 5.3.4**.

Attachment 1 - Summary of data inputs

Broad assessment approach

In developing its proposed funding profiles, the NRC has endeavoured to:

- **Use the best available state-wide spatial priority mapping where available** - to leverage off existing expertise, decision rules and decision support tools that can combine and integrate a range of disparate datasets, models and statistical packages.
- **Ensure higher priority areas are appropriately weighted** - by applying a weighting ratio (for example, Very high priority = 5x; High priority = 3x; Medium priority = 1x; Low priority=0x) to ensure relatively higher priority areas attract more investment than other areas with lesser priority.
- **Apply intuitive and simple decision rules** - for example, generating equal bands to rank scores (between lowest and highest measures) and applying recognised natural resource management investment principles in cases where no state-wide priority mapping with in-built decision rules exists (such as protecting assets already in good condition and restoring others in lesser health)
- **Use common sense and judgement where appropriate** - to manage situations where statistical anomalies, data gaps and decision rules are impacting on the broad allocation of funding, for instance, to manage outliers that are adversely affecting the ranking process, or to address instances where a region's score lies on the boundary between ranking classes.

Funding theme	Information source & standard	Key principles, decision rules & assumptions	Strengths and limitations
Native vegetation	<p>Native vegetation benefit mapping</p> <ul style="list-style-type: none"> ▪ NSW Office of Environment and Heritage’s Native Vegetation Management Benefits analysis and mapping (2012) ▪ Analysis based on Biodiversity Forecasting Tool using best available data such vegetation condition ▪ The NRC scores the standard of this information a five (5) for funding allocation 	<ul style="list-style-type: none"> ▪ Priority ranking should align with the NSW Government’s (the investor’s) goals to protect and restore priority native vegetation (and biodiversity) as set out in <i>NSW 2021</i>. ▪ Higher rankings should be allocated to Local Land Services regions with more area (ha) identified as a priority for native vegetation management benefits. ▪ Due to known data limitations in western NSW, the NRC has increased the Western Local Land Services score for the <i>native vegetation - improve condition</i> criterion from 1 to 2 to address the issues with underestimation of priority areas described in the mapping methodology. 	<p>Strengths</p> <ul style="list-style-type: none"> ▪ Uses best available, peer reviewed predictive modelling. ▪ Provides a strong surrogate for overall terrestrial biodiversity benefits (representing a significant evolution in techniques applied to state-scale biodiversity benefits modelling). ▪ Complements more localised and detailed data and provides greater investment priority resolution where state-scale and catchment scale priorities overlap. <p>Weaknesses</p> <ul style="list-style-type: none"> ▪ Limitations in predicting benefits in arid systems, particularly given the lack of data on total grazing pressure. This data gap limits the analysis of variations in condition across Western landscapes, and as a result the area of arid vegetation types that require management is underestimated. This has been identified as a particular issue for the ‘improve condition’ criterion. ▪ The connectivity (‘consolidate’) benefits layer is based only on the eastern and central divisions of NSW (assumes the western division is already considered to be relatively well intact even though there may be habitats in these areas that warrant conservation and restoration interventions). ▪ Biodiversity Forecasting Tool is an equilibrium model benchmarked against pre-European landscapes.

Pest animals

- NSW Department of Primary Industries' distribution and abundance for new and emerging pest animals spatial layers (2008)
- The NRC scores the standard of this information a **two (2)** for funding allocation

- Priority ranking should align with the NSW Government's (the investor's) goals to manage pests as set out in *NSW 2021*.
- Higher rankings should be allocated to Local Land Services regions with more emerging and new pest animals to manage.
- Assumes a national or state-scale investor would have a stronger preference for investment that is consistent with current strategies and legislation for pest animals, namely eradicating or preventing entry of new or emerging pest animals (consistent with objective 1 and 2 of NSW Biosecurity Strategy), and with a higher preference for addressing pest animals that are relatively more abundant than others.

Strengths

- Aligns with well-defined national and state goals and priorities for pest management (although not spatially defined).
- Incorporates local survey data for new and emerging pest animals.
- Expert based abundance and distribution index mapping for new and emerging pest animals.

Weaknesses

- Currency of the data given the potential dynamic nature of invasive species.
- No existing state-wide, expert based priority mapping for new and emerging pests (rather decision rules and priority ranking scores created for NRC funding allocation process).

Weeds

- NSW Department of Primary Industries, NSW Office of Environment and Heritage and former Catchment Management Authorities (now Local Land Services) joint project 'Biodiversity priorities for widespread weeds' (2011)
- The NRC scores the standard of this information a **three (3)** for funding allocation

- Priority ranking should align with the NSW Government's (the investor's) goals to manage weeds as set out in *NSW 2021*.
- Higher rankings should be allocated to Local Land Services regions with more sites identified as biodiversity priority sites for widespread weed management.
- Assumes a national or state-scale investor would have a stronger preference for investment that is consistent with current strategies and legislation for weeds, namely eradicating or preventing entry of weeds across all of the state (consistent with objectives 1 and 2 of NSW Biosecurity Strategy and class 1 noxious weeds under the *Noxious Weeds Act 1997*), and with a higher preference for addressing

Strengths

- Specifically targets weeds impacting biodiversity.
- Spatial data was compiled in a standardised and consultative manner with regional participation through Catchment Management Authorities.
- The dynamic model that underpins the data could be useful for future funding allocations if consistently adopted by regions.

Weaknesses

- Age of data - the project was finalised in 2010 and was intended for establishing priorities for investment for biodiversity conservation to 2015.

		weeds that are relatively more abundant than others.	
Biodiversity conservation	Soils	<ul style="list-style-type: none"> University of New England’s priority area to improve land management spatial layer (commissioned by NRC) Identifies areas that are reaching biophysical tipping points and are likely to cause irreversible damage to soil condition The NRC scores the standard of this information a three (3) for funding allocation 	<ul style="list-style-type: none"> Priority ranking should align with the NSW Government’s (the investor’s) goal to protect and restore priority land as set out in <i>NSW 2021</i>. Higher rankings should be allocated to Local Land Services regions with more area (hectares) identified as a priority for improving land management practices and avoiding irreversible biophysical tipping points. <p>Strengths</p> <ul style="list-style-type: none"> Uses best available state-wide datasets and the multi-criteria analysis shell (MCAS-S) spatial mapping software. Uses a resilience based approach to analyse the immediacy of threats to highest value soil ecosystem services reaching irreversible tipping points. Considers economic and environmental values such as production and soil biodiversity. Addresses recognised state-wide knowledge gaps for soil and land management. <p>Weaknesses</p> <ul style="list-style-type: none"> Weightings and assumptions have not undergone full expert review.
	Rivers	<ul style="list-style-type: none"> NSW Office of Water’s river action priorities analysis and mapping (2012) Analysis based on risk assessment and input datasets for River Condition Index (RCI) Incorporates indices such as riparian vegetation cover, biodiversity condition and hydrology The NRC scores the standard of this information a four (4) for funding allocation 	<ul style="list-style-type: none"> Priority ranking should align with the NSW Government’s (the investor’s) goals to protect and restore priority water habitats and rivers as set out in <i>NSW 2021</i>. Higher rankings should be allocated to Local Land Services regions with more length (kilometres) of river systems identified as priority action areas to protect and restore. <p>Strengths</p> <ul style="list-style-type: none"> Uses best available, peer reviewed predictive modelling. Represents areas of greatest need or urgency for management intervention or conservation. Can also track long term changes in the condition of rivers as a result of investment. <p>Weaknesses</p> <ul style="list-style-type: none"> Risks to in-stream values are scored relative across a region, rather than state-wide (however, a state-wide analysis is feasible in the future).

Estuaries

- NSW Office of Environment and Heritage’s pressure and condition indices for NSW estuaries (NSW Spatial Data Catalogue)
- Based on a range of condition and pressure indicators
- The NRC scores the standard of this information a **two (2)** for funding allocation
- Priority ranking should align with the NSW Government’s (the investor’s) goals to protect and restore priority coastal environments as set out in *NSW 2021*.
- Higher rankings should be allocated to Local Land Services regions with a greater number of higher priority estuaries to protect and restore.
- Assumes investors at the state-scale are and more likely to gain a higher return on investment if actions:
 - to protect estuaries are focused on those that are in higher condition, and under higher pressure;
 - to restore estuaries are focused on those that are in lower condition, and under lower pressure
 - to protect and/or restore estuaries are avoided on estuaries that are generally in very poor condition.

Strengths

- Uses best available state-wide datasets and published methodologies.
- Supported by local scale monitoring programs.
- Incorporates catchment rainfall runoff modelling.

Weaknesses

- No existing state-wide, expert-based priority mapping for estuaries (rather, decision rules and priority ranking scores were created for the NRC funding allocation process).
- Condition data gaps across some estuaries.
- Many estuaries are degraded and/or under pressure (with the exception of South East Local Land Services region) making discrimination between rankings for Local Land Services regions difficult.

Wetlands

- NSW Office of Environment and Heritage’s NSW Wetlands spatial database
- NSW Planning and Infrastructure’s State Environmental Planning Policy No. 14 – Coastal Wetlands spatial database (1989)
- Australian Government Department of the Environment (formerly Department of Sustainability, Environment, Water, Population and Communities) Directory of Important Wetlands spatial database
- The NRC scores the standard of this information a **one (1)** for funding allocation
- Priority ranking should align with the NSW Government’s (the investor’s) goals to protect and restore priority water habits, wetlands and coastal environments as set out in *NSW 2021*.
- Higher rankings should be allocated to Local Land Services regions with more area of higher priority wetlands to protect and restore.
- Assumes a national or state-scale investor is likely to have a stronger preference to invest in wetlands that are associated with international and/or national intergovernmental agreements (Ramsar and Directory of Important Wetlands) and state and national legislations (State Environmental Planning Policy No 14).

Strengths

- Aligns with well-defined and recognised national and state values for different wetlands.

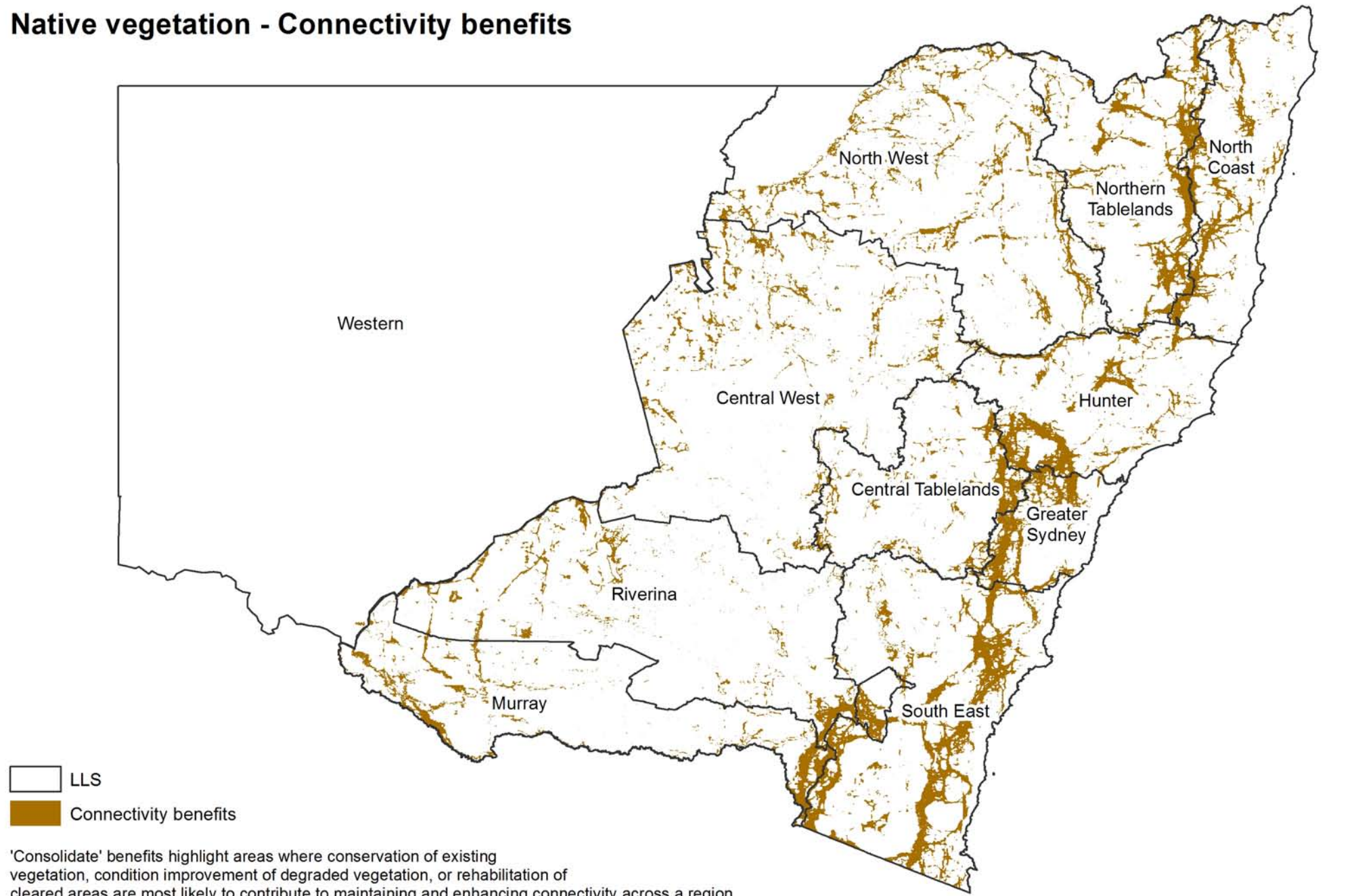
Weaknesses

- Lacks condition and pressure data and context (either poor quality or highly variable at different scales).
- No existing state-wide, expert based priority mapping for wetlands (rather, decision rules and priority ranking scores were created for the NRC funding allocation process).

	<ul style="list-style-type: none"> The NRC has used a grouping approach to ranking (rather than the usual equal bands) across the measures to avoid an outlier significantly skewing overall ranking results.
Threatened species	<p>Saving our species</p> <ul style="list-style-type: none"> NSW Office of Environment and Heritage’s Saving our Species listings and distribution mapping (2013-14) Priorities for action are contained within the following four management streams: <ul style="list-style-type: none"> site-managed species landscape-managed species iconic species data-deficient species. The NRC scores the standard of this information a three (3) for funding allocation <ul style="list-style-type: none"> Priority ranking should align with the NSW Government’s (the investor’s) goals to protect threatened species, as set out in <i>NSW 2021</i>. Higher rankings should be allocated to Local Land Services regions with the greatest number and distribution of priority threatened species. Wollemi Pine is listed as one of five iconic species. However, Office of Environment and Heritage will not release information about which Local Land Services region this species is found in. As such, this species is not included in the analysis. <p>Strengths</p> <ul style="list-style-type: none"> Uses publically available, agency developed priority mapping and/or listings. <p>Weaknesses</p> <ul style="list-style-type: none"> Only one of the management streams has undergone a further prioritisation process.
Aboriginal cultural heritage	<p>Aboriginal cultural heritage</p> <p>Equal allocation as no suitable metrics identified.</p>

Attachment 2 - Priority mapping

Native vegetation - Connectivity benefits

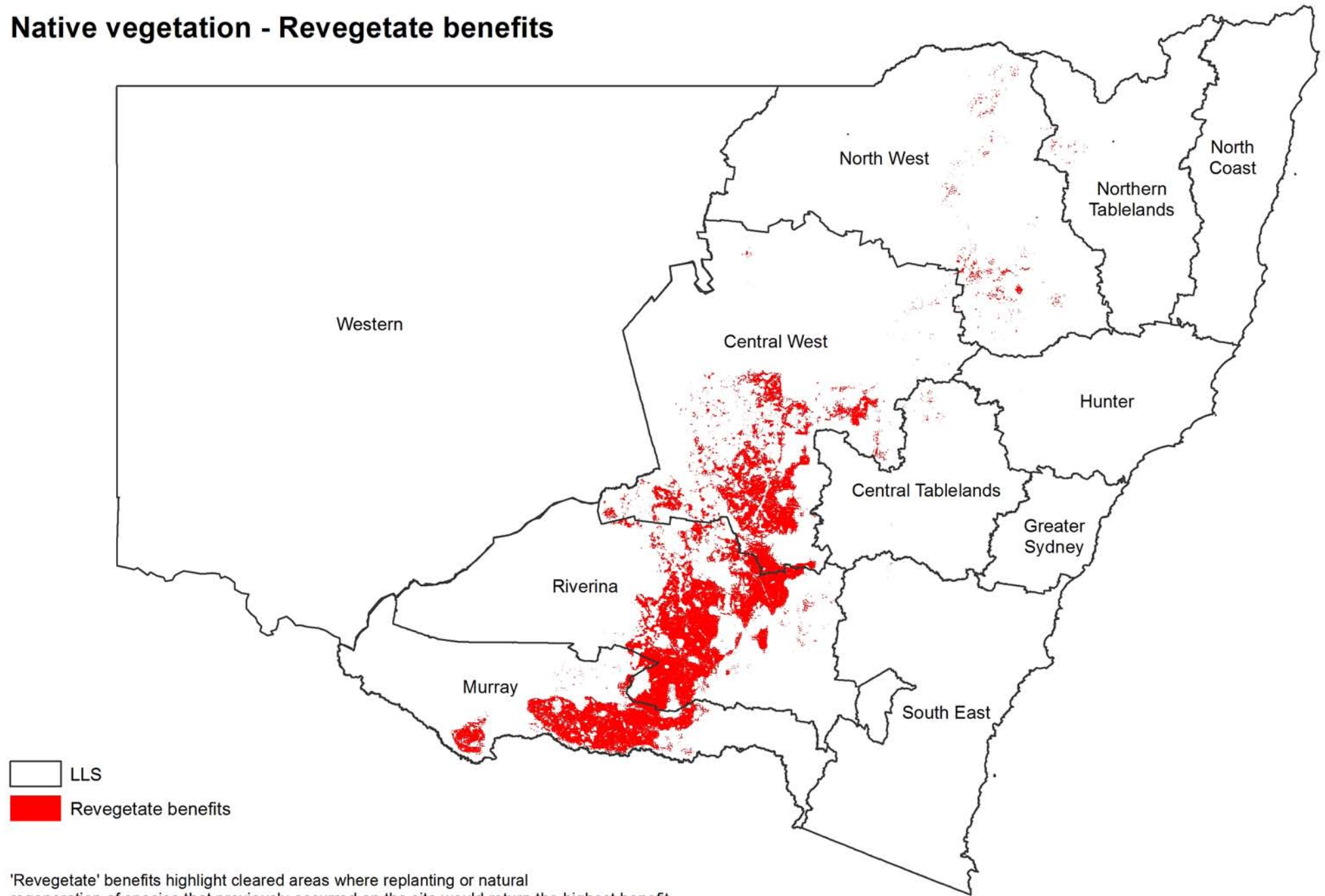


'Consolidate' benefits highlight areas where conservation of existing vegetation, condition improvement of degraded vegetation, or rehabilitation of cleared areas are most likely to contribute to maintaining and enhancing connectivity across a region.

Spatial data and analyse courtesy of:
NSW Office of Environment and Heritage (OEH)
NRC ref: Map N1 - Funding - Native veg - connectivity

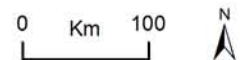


Native vegetation - Revegetate benefits

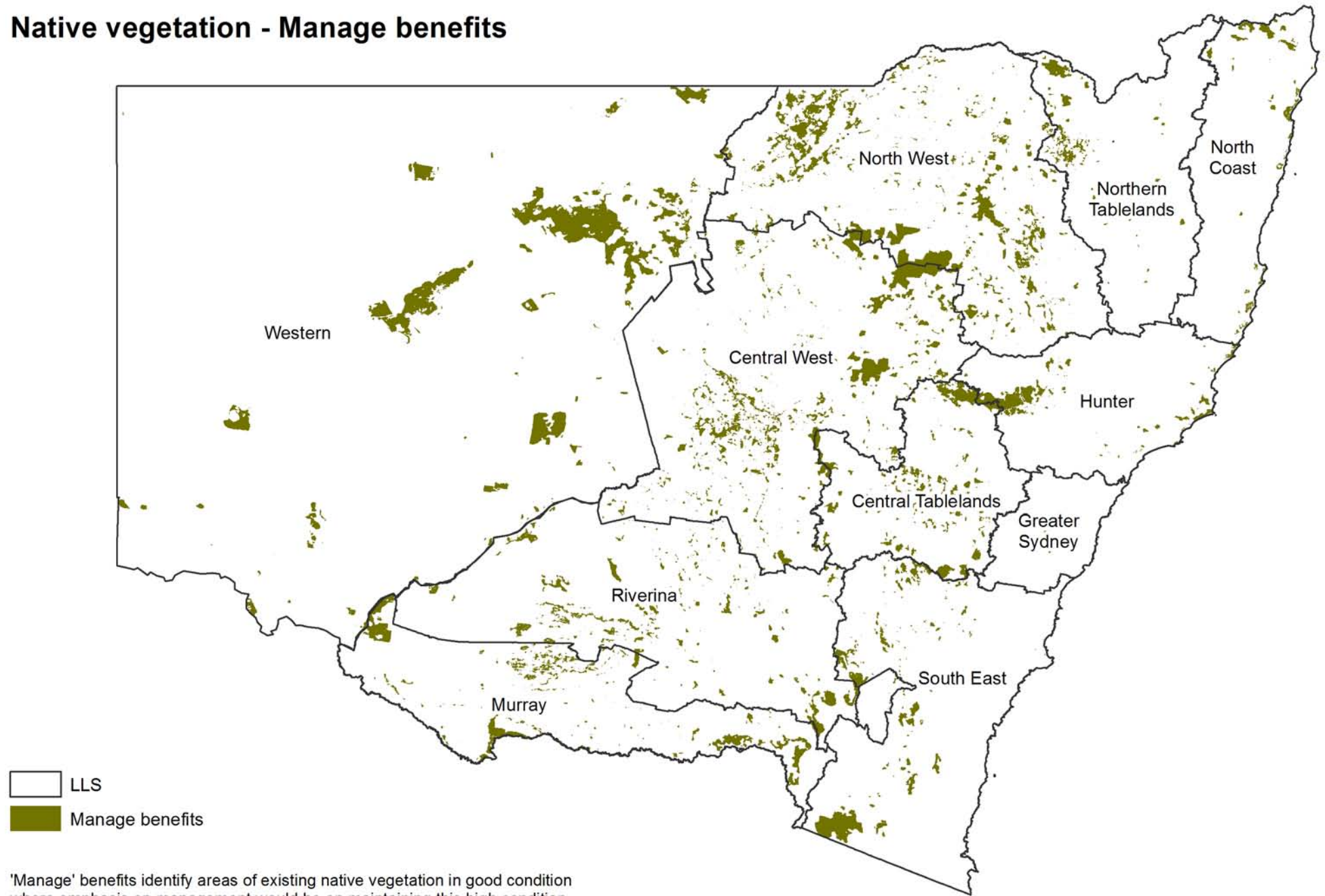


'Revegetate' benefits highlight cleared areas where replanting or natural regeneration of species that previously occurred on the site would return the highest benefit.

Spatial data and analyse courtesy of:
NSW Office of Environment and Heritage (OEH)
NRC ref. Map N4 - Funding - Native veg - revegetate

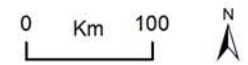


Native vegetation - Manage benefits

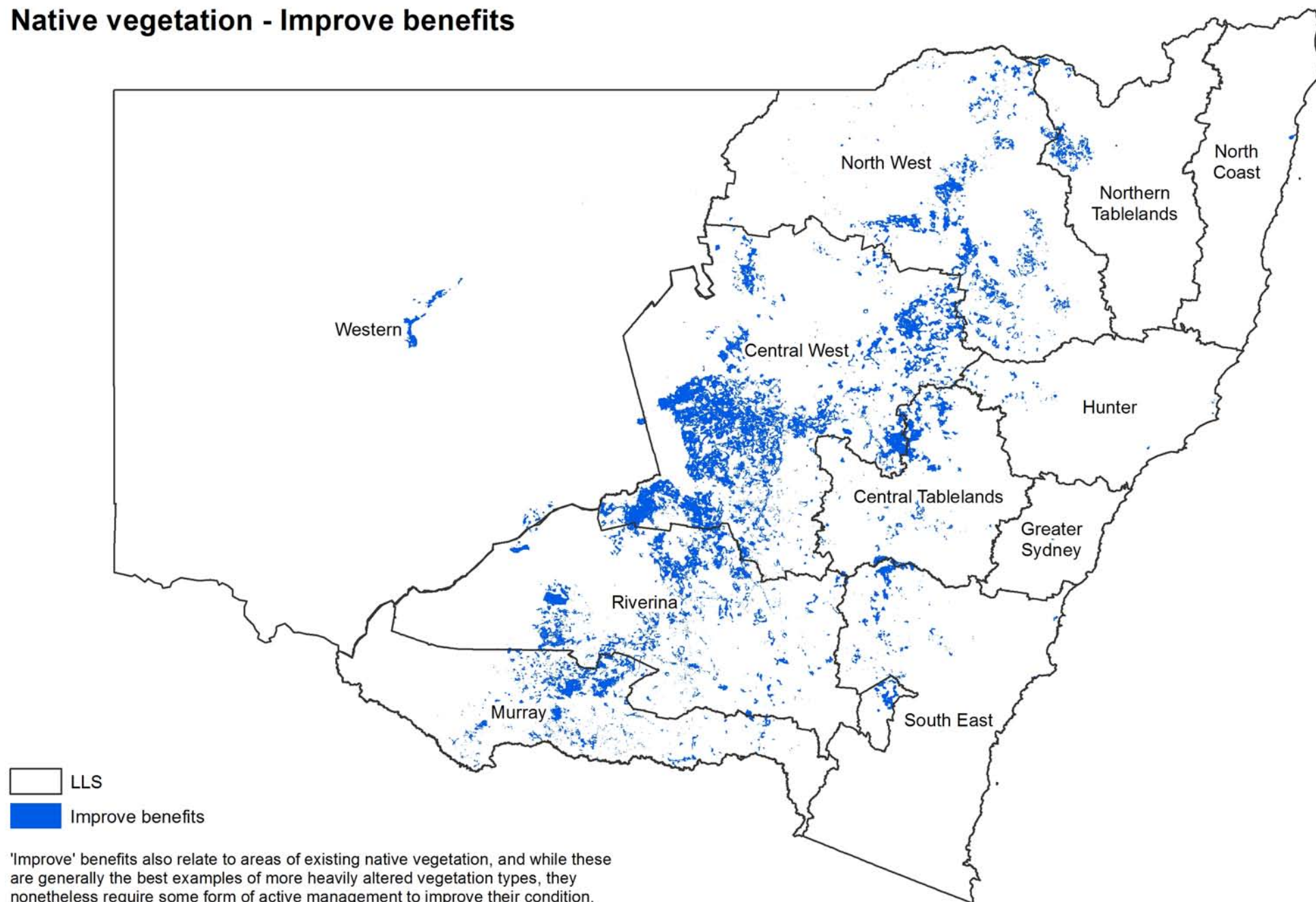


'Manage' benefits identify areas of existing native vegetation in good condition where emphasis on management would be on maintaining this high condition.

Spatial data and analyse courtesy of:
NSW Office of Environment and Heritage (OEH)
NRC ref: Map N3 - Funding - Native veg - manage



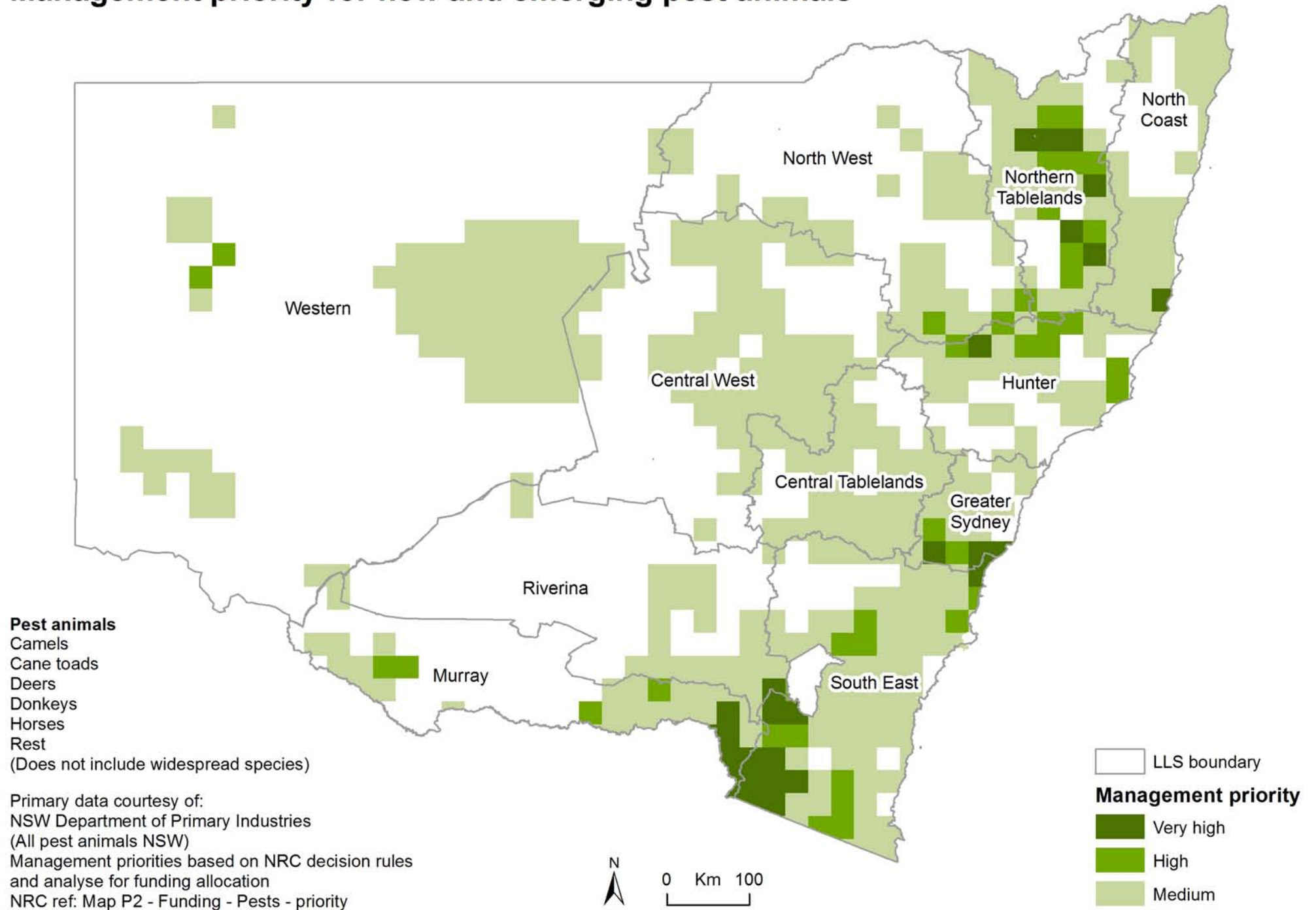
Native vegetation - Improve benefits



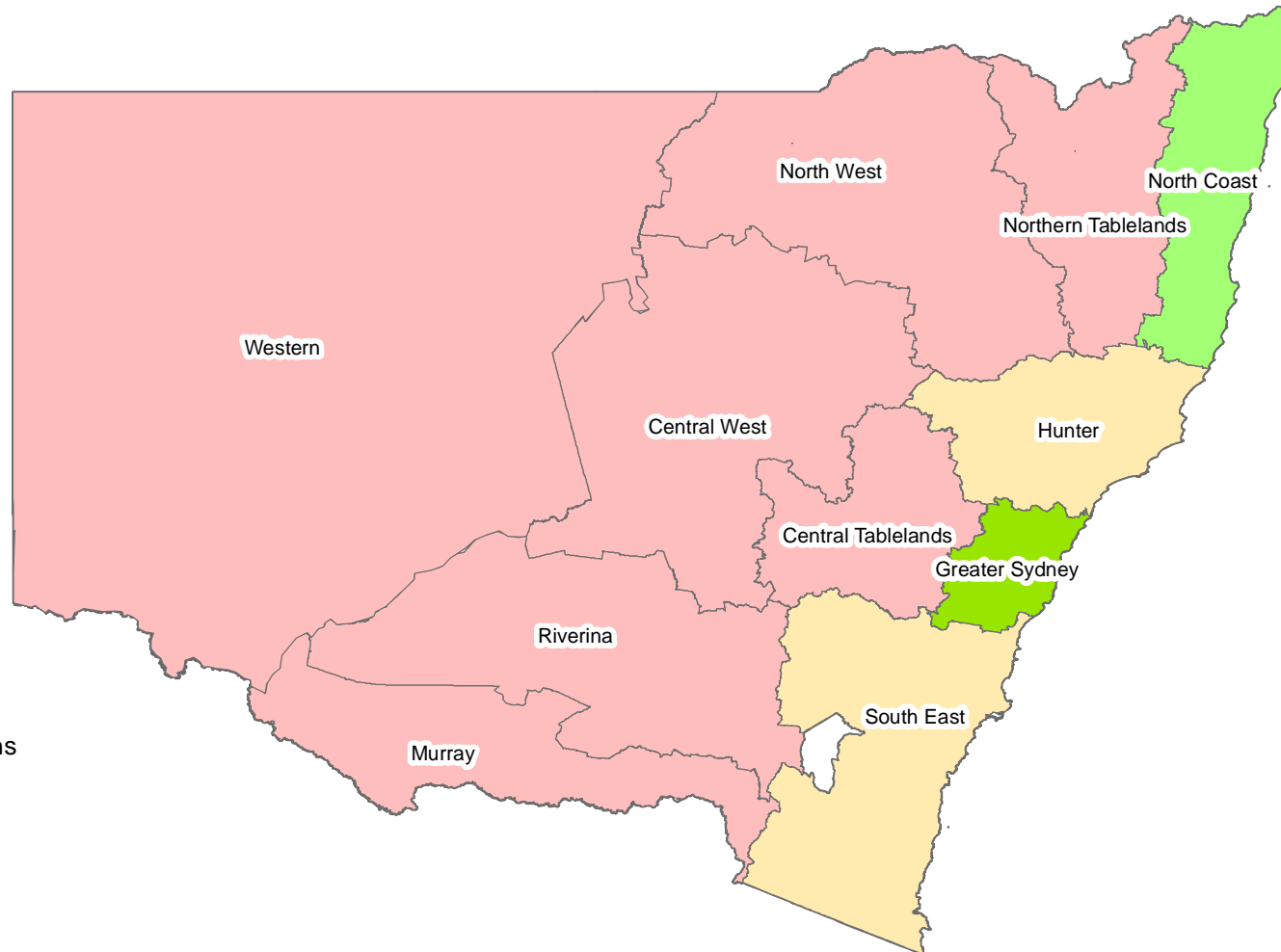
Spatial data and analyse courtesy of:
NSW Office of Environment and Heritage (OEH)
NRC ref. Map N2 - Funding - Native veg - improve




Management priority for new and emerging pest animals



Biodiversity priorities for widespread weeds



Legend

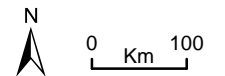
 Local Land Service regions

 NSW

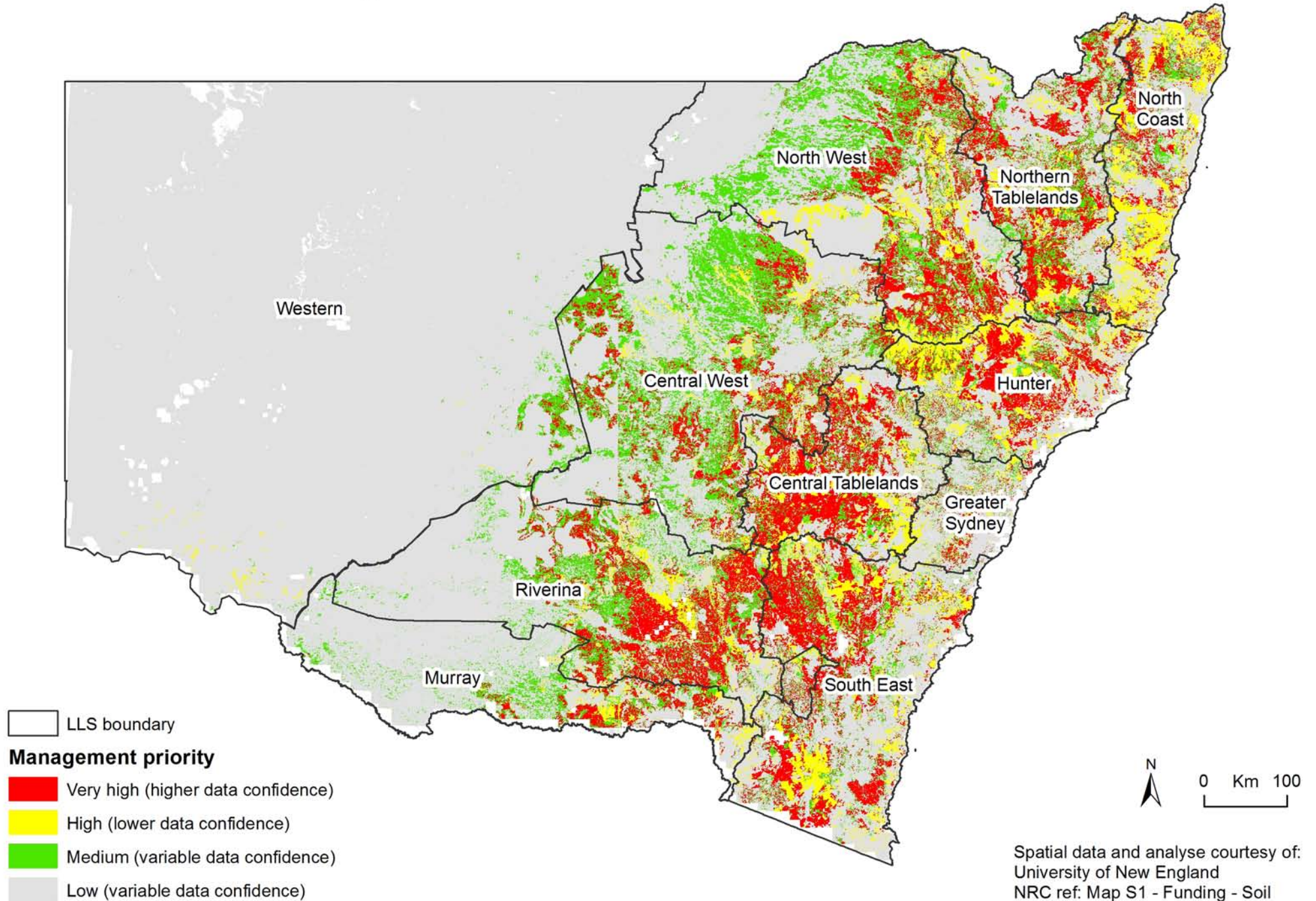
Ranking



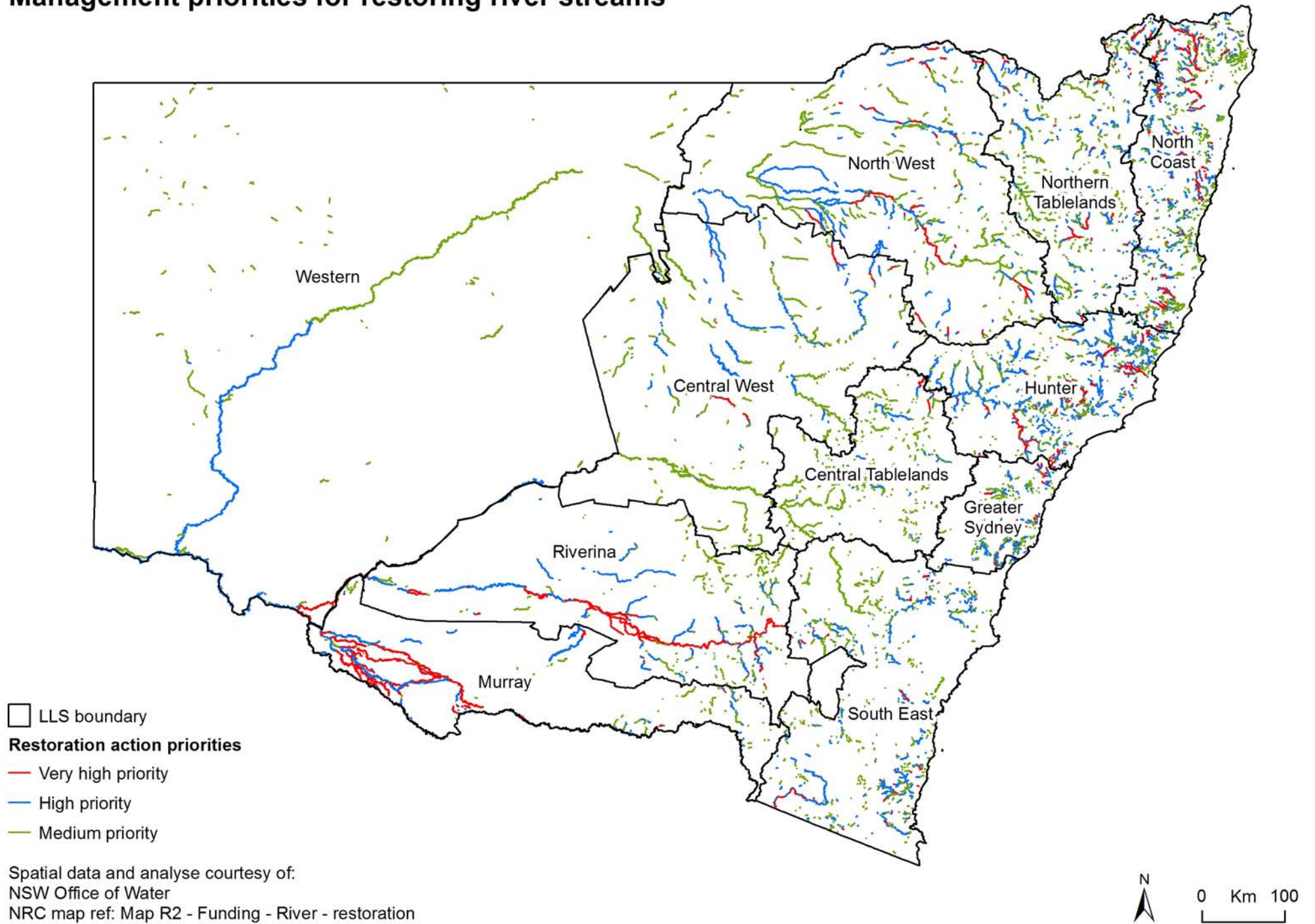
Notes:
NSW DPI and OEH (2011) Biodiversity priorities for widespread weeds
Refer to D14/3330 for underlying calculations
Map ref: 2. Biodiversity priorities for widespread weeds - LLS rankings



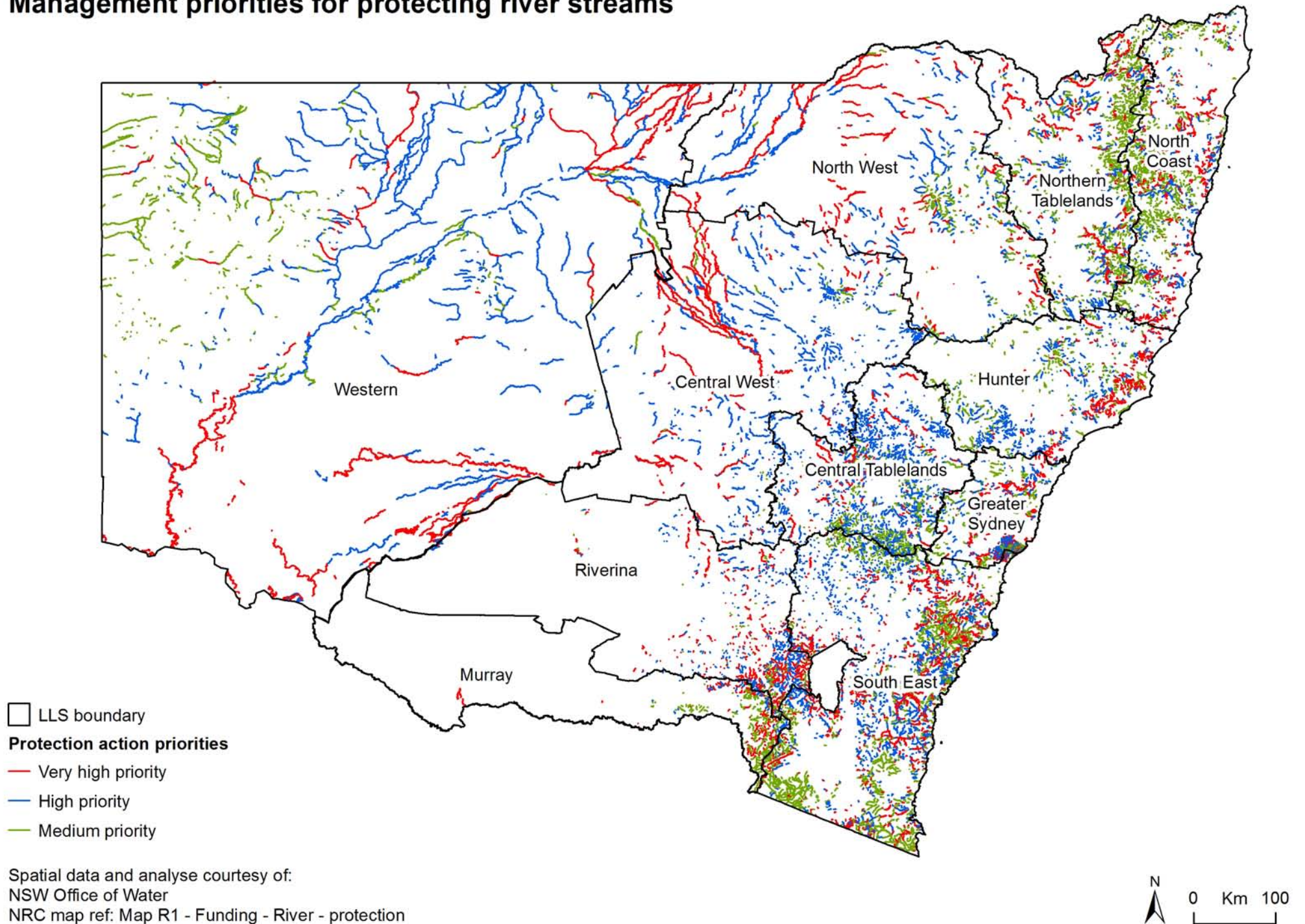
Priorities for land management actions to maintain soil health and function



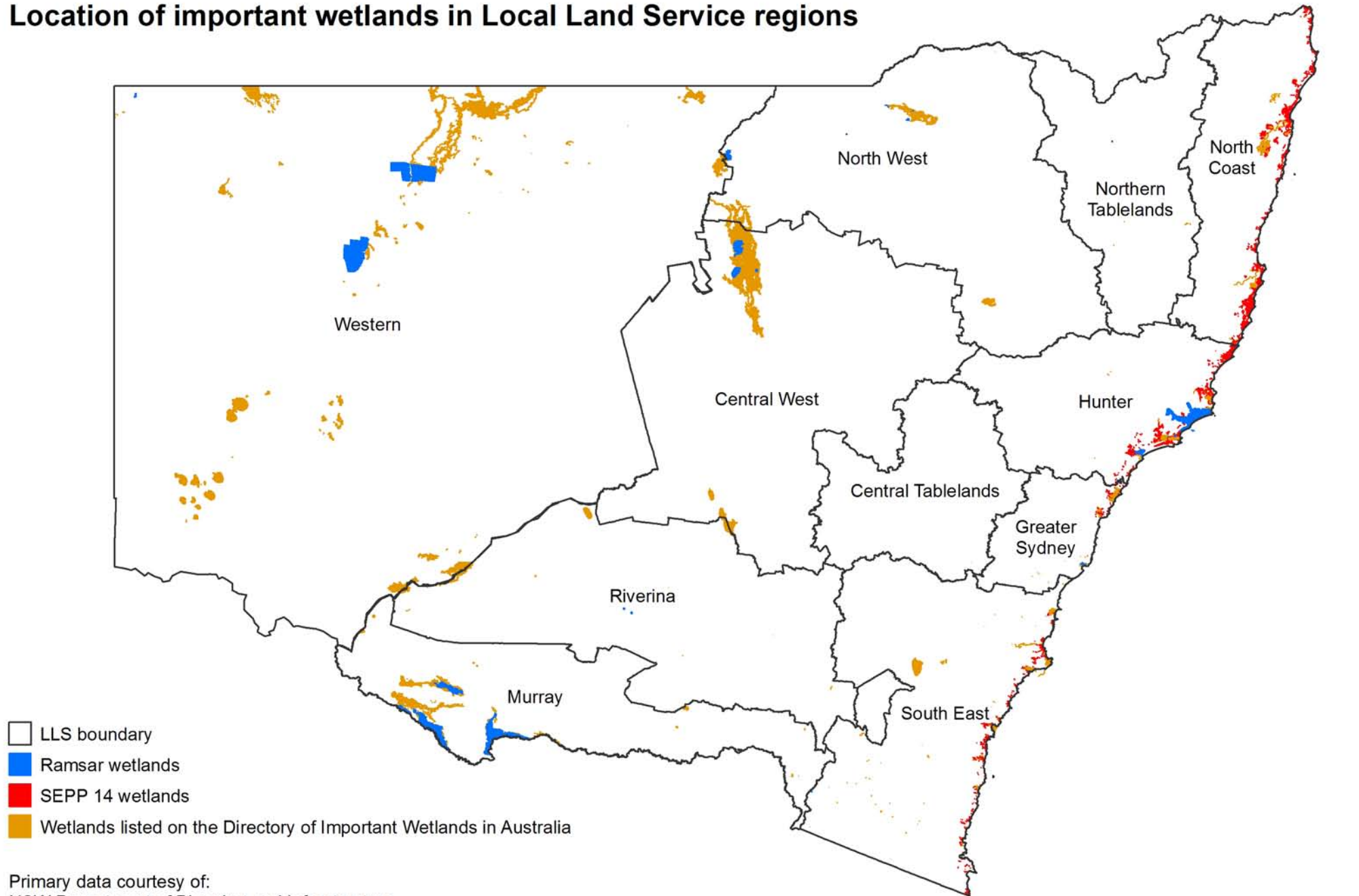
Management priorities for restoring river streams



Management priorities for protecting river streams

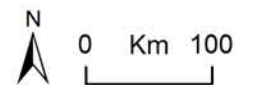


Location of important wetlands in Local Land Service regions

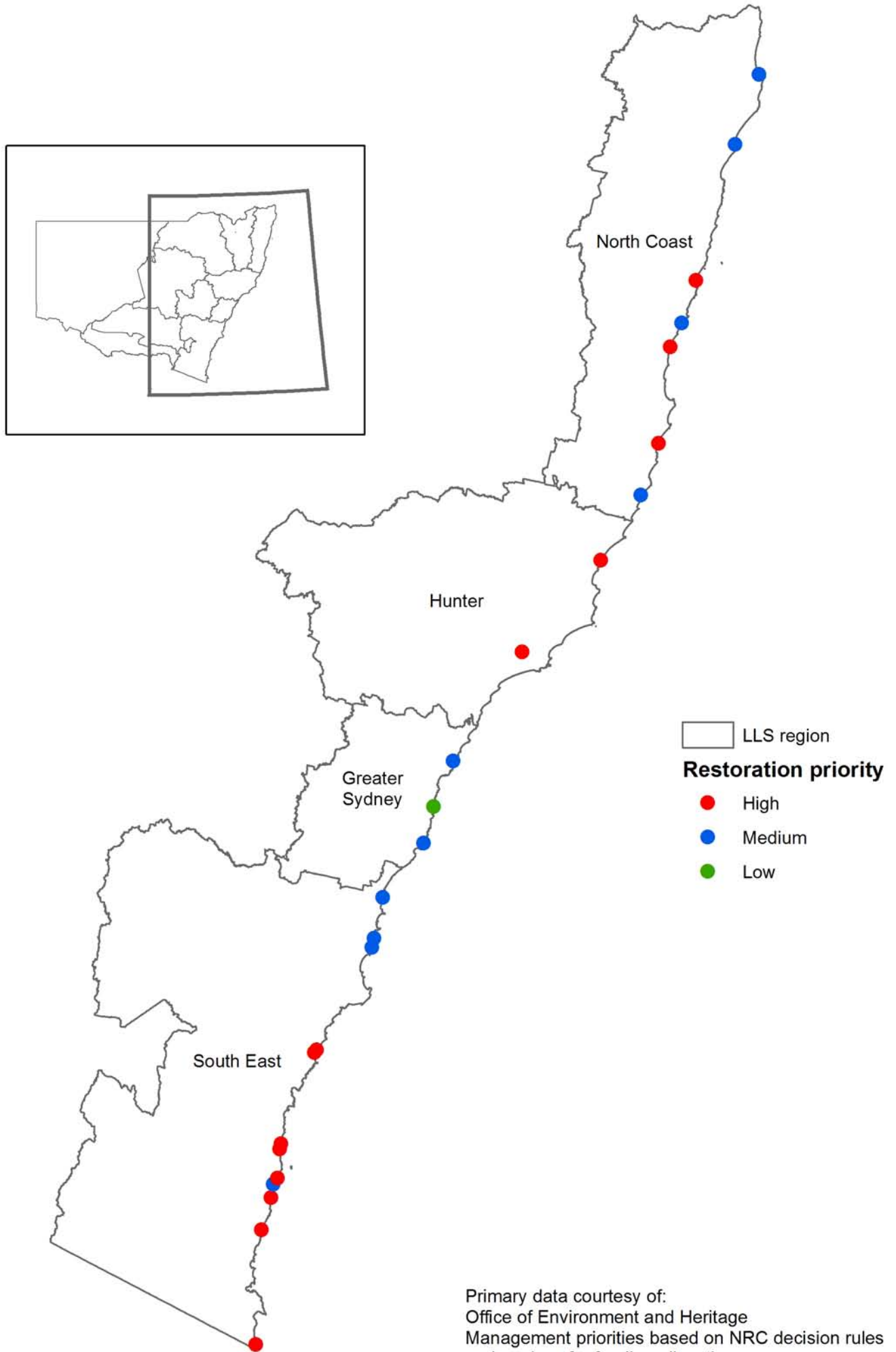


- LLS boundary
- Ramsar wetlands
- SEPP 14 wetlands
- Wetlands listed on the Directory of Important Wetlands in Australia

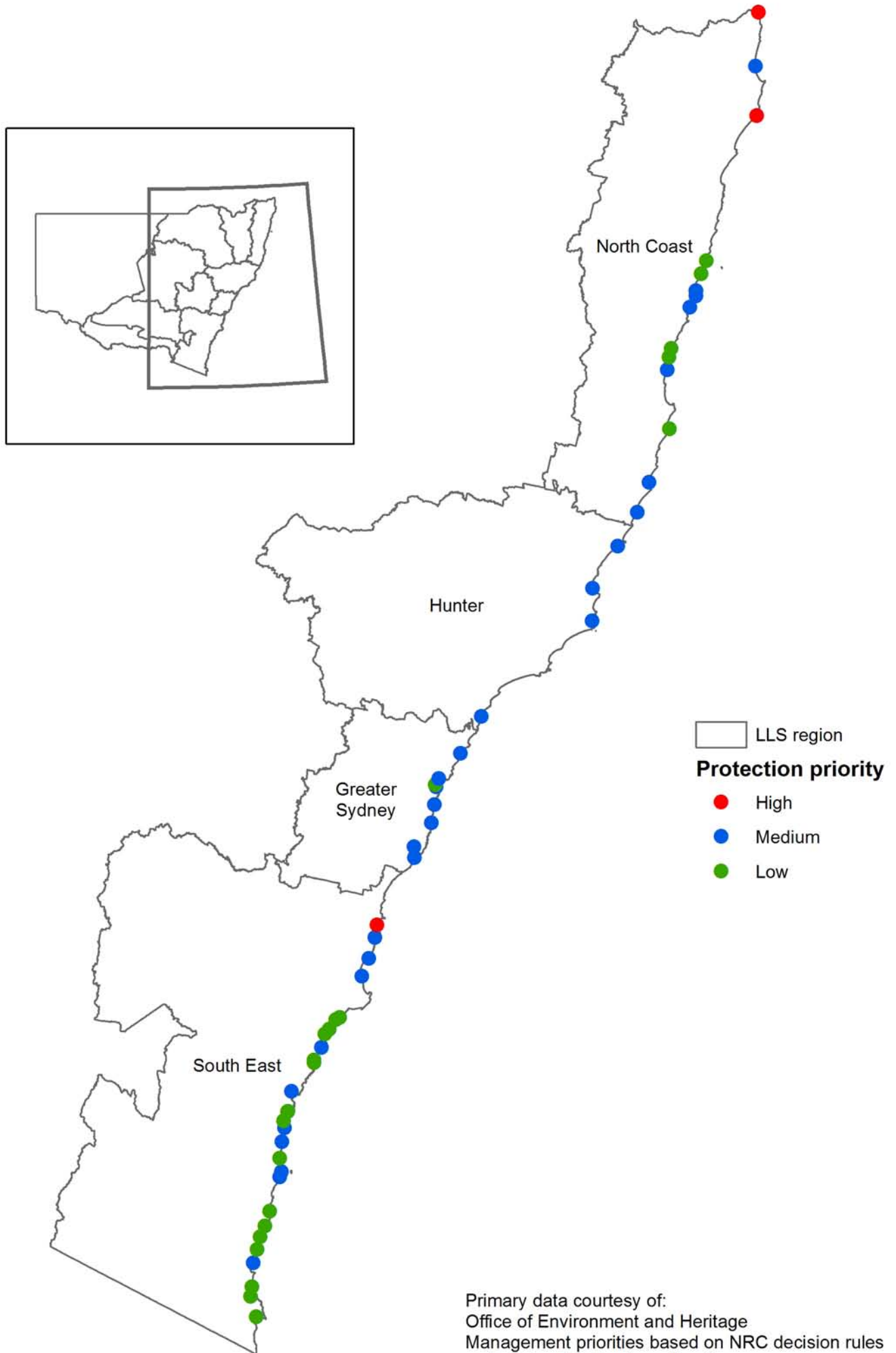
Primary data courtesy of:
NSW Department of Planning and Infrastructure
Australian Government Department of Sustainability, Environment,
Water, Population and Communities
NRC ref: Map W3 - Funding - Wetland - location



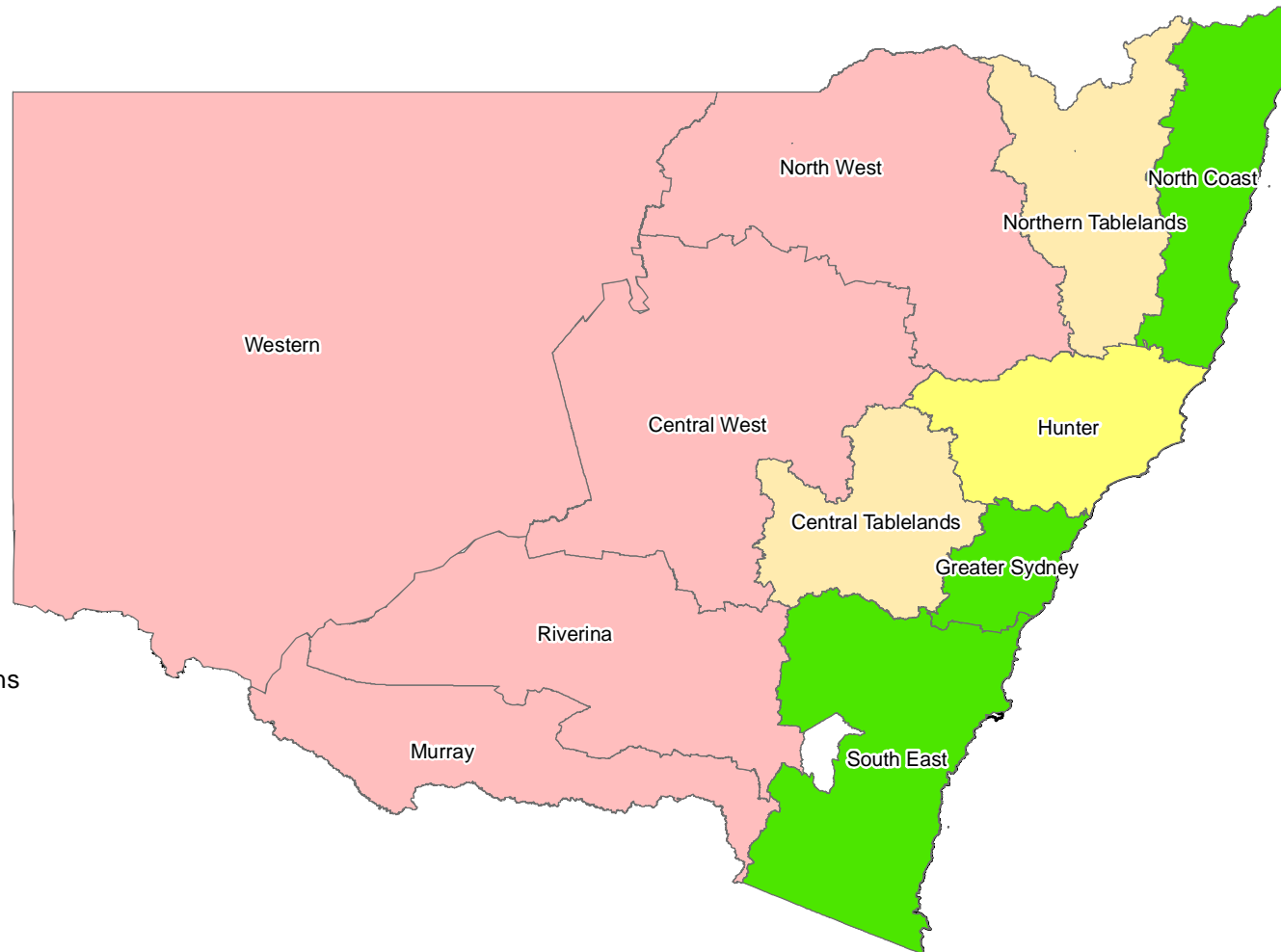
Management priorities for restoring estuaries




Management priorities for protecting estuaries



Threatened species - Site-managed species



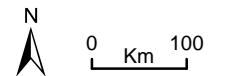
Legend

 Local Land Service regions

Ranking




Notes:
OEHT (2014), Saving our Species - regional breakdown
Map ref: 3d. Threatened species - Saving our Species - Site-managed species - LLS rankings



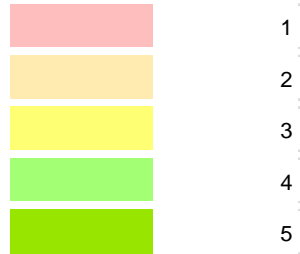
Threatened species - Iconic species



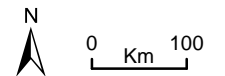
Legend

 Local Land Service regions

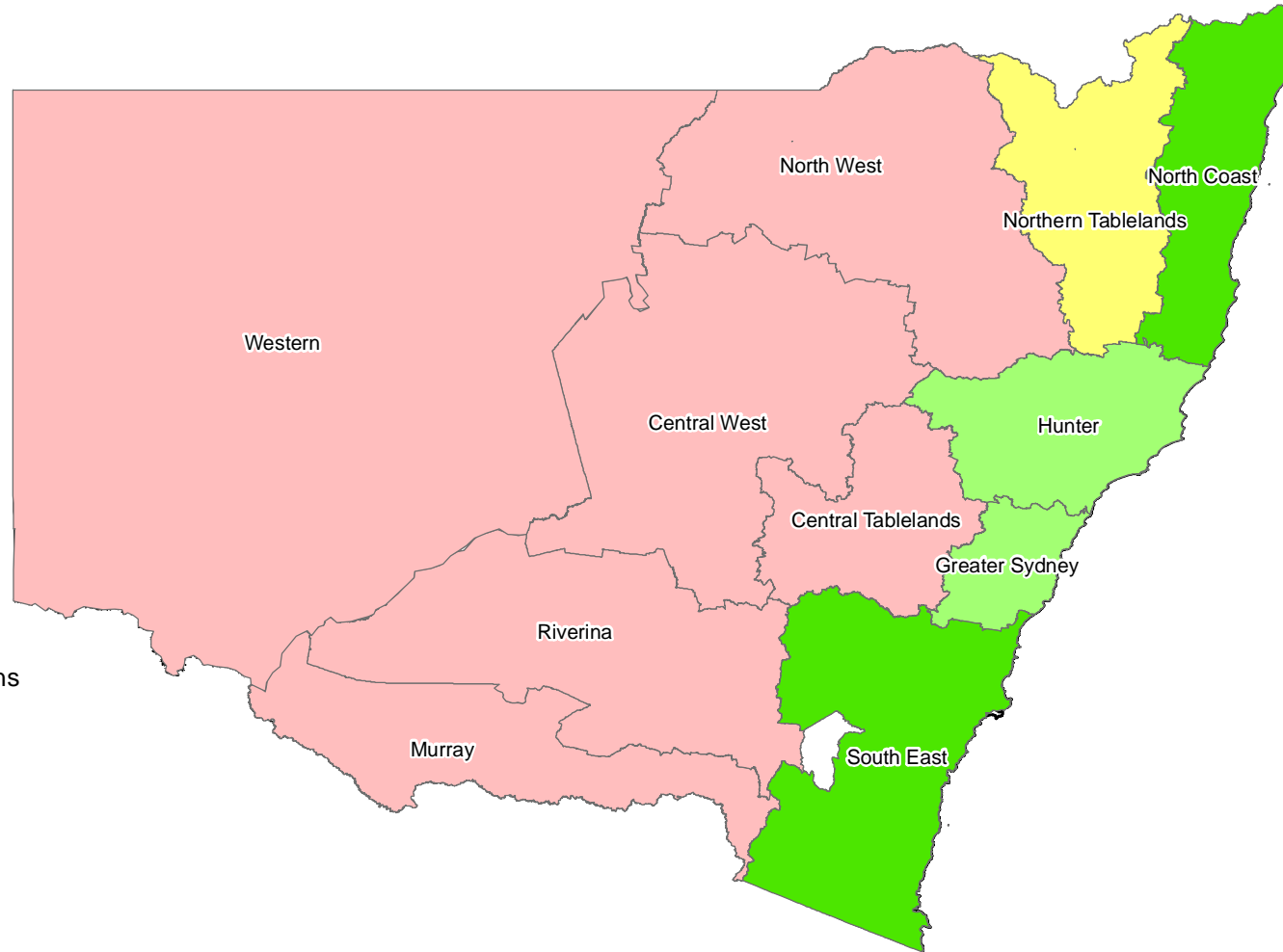
Ranking




Notes:
OEHT (2014), Saving our Species - regional breakdown
Map ref: 3b. Threatened species - Saving our Species - Iconic species - excluding Wollemi Pine - LLS rankings



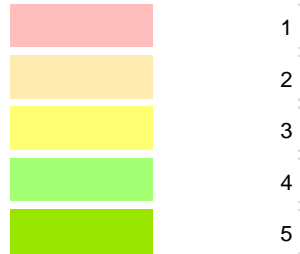
Threatened species - Landscape-managed species



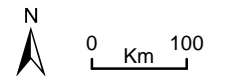
Legend

 Local Land Service regions

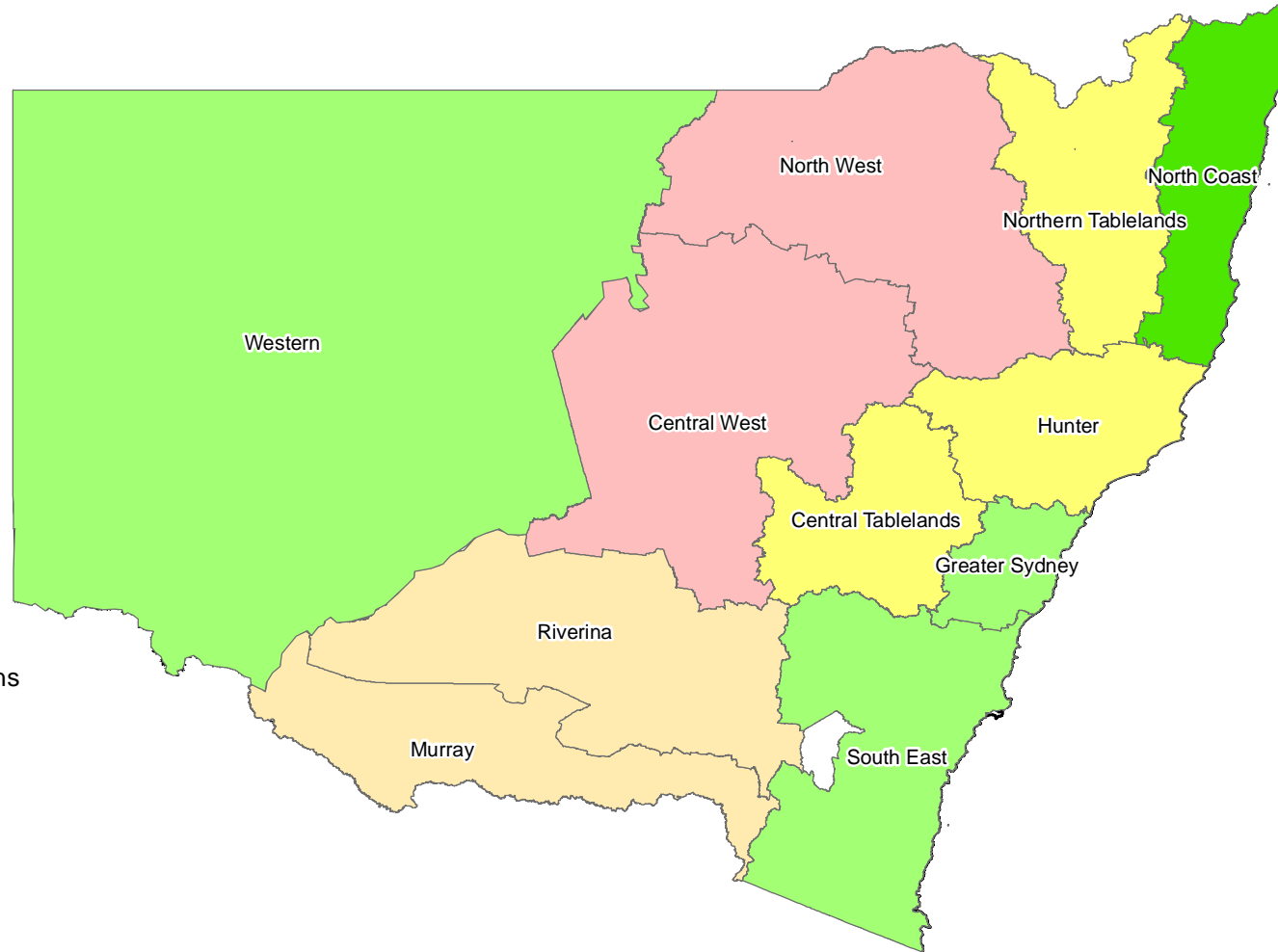
Ranking




Notes:
OEht (2014), Saving our Species - regional breakdown
Map ref: 3c. Threatened species - Saving our Species - Landscape-managed species - LLS rankings



Threatened species - Data-deficient species



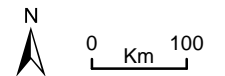
Legend

 Local Land Service regions

Ranking



Notes:
OEht (2014), Saving our Species - regional breakdown
Map ref: 3a. Threatened species - Saving our Species - Data-deficient - LLS rankings



Attachment 3 - Summary of Local Land Services regional scores

Assessment criteria	Sub-criteria	Inputs	Scores										
			Central Tablelands	Central West	Greater Sydney	Hunter	Murray	North Coast	North West	Northern Tablelands	Riverina	South East	Western
Native vegetation	Native vegetation	Connectivity	2	3	2	3	2	3	4	4	2	5	1
		Increase extent	1	4	1	1	3	1	1	1	5	1	1
		Maintain condition	2	3	1	1	2	1	4	1	2	2	5
		Improve condition	1	5	1	1	2	1	2	1	2	1	2
	Pests and weeds	Pest animals	1	1	3	3	3	2	2	5	2	5	2
		Weeds	1	1	5	2	1	4	1	1	1	2	1
Biodiversity conservation	Soil	Soil condition	4	5	1	4	2	3	5	4	5	5	1
	Rivers	Restore	1	2	1	4	5	4	4	2	3	2	3
		Protect	2	2	1	1	1	1	2	2	1	3	5
	Wetlands	Priority wetlands	1	3	2	4	4	2	2	1	2	2	5
	Estuaries	Restore	0	0	2	2	0	3	0	0	0	5	0
		Protect	0	0	2	2	0	4	0	0	0	5	0
Threatened species	Saving Our Species	Site managed	2	1	5	3	1	5	1	2	1	5	1
		Landscape managed	1	1	4	4	1	5	1	3	1	5	1
		Iconic	3	3	1	3	3	1	3	1	5	3	3
		Data deficient	3	1	4	3	2	5	1	3	2	4	4
Aboriginal cultural heritage	-	Equal scores											