

# Advice to the NSW Environmental Trust

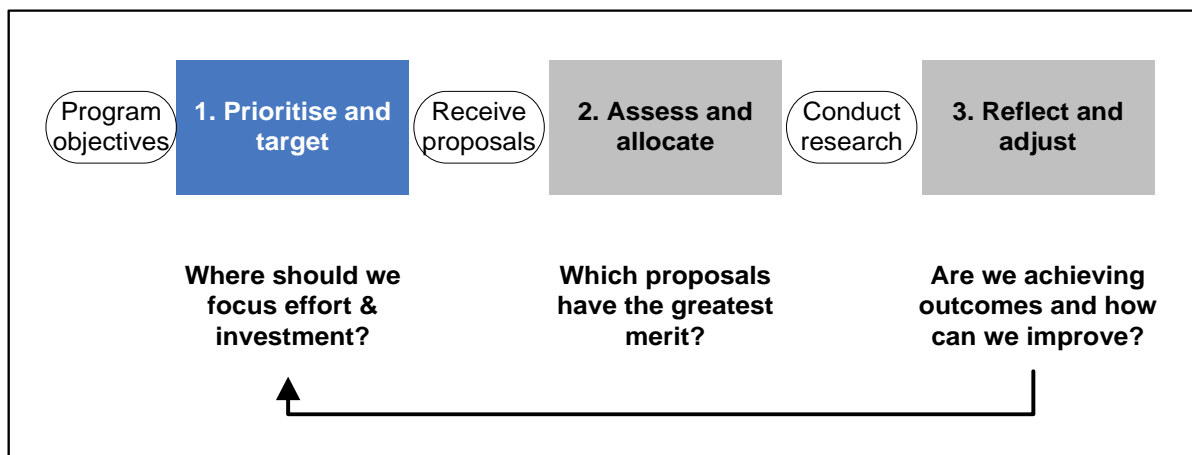
## Priorities for the Environmental Research Program

### 1 Background

- The Environmental Trust (the Trust) has asked the Natural Resources Commission (NRC) to work with it to:
  - 1 develop a framework and process for developing priority themes for the Environmental Research Program
  - 2 apply the process to develop priority themes for the 2015 application round
  - 3 provide advice about how the prioritisation process could be further improved for future rounds.
- This paper explains the NRC's work and advice. To develop this advice, the NRC has consulted with:
  - the Environmental Trust, including members of its scientific technical committee
  - a range of stakeholders, including relevant NSW government agencies, non-government organisations and environment and industry groups.

### 2 Scope of work

- **Figure 1** illustrates the broad steps the Trust uses to implement the Environmental Research Program. The Trust has asked for advice in step 1 only.



**Figure 1: Overall steps in the Trust's research program.**

- For the purpose of this task, the NRC defines 'research' under the Environmental Research Program as:
  - broadly, the systematic gathering of data, information and facts to advance knowledge and develop new techniques; or
  - specifically, scientific research where hypotheses are formulated and empirically tested to guide application over reasonable and practical timeframes.

### 3 Prioritisation framework

- **Figure 2** shows a framework the NRC developed and used to identify and develop a set of priority research themes for the Environmental Research Program.
- The framework is designed to provide a rigorous and objective approach to develop priority research themes. It should sharpen the focus and help improve the quality of applications the Trust receives for the program.
- The framework includes:
  - **Prioritisation principles** that set out the ‘why’ we should prioritise and helps ground the framework.
  - **Program objectives** that ensure the assessment and outputs are aligned with the Environmental Research Program’s objectives.
  - **Filter analysis** that uses a simple binary assessment (yes/no) and helps to short-list research themes identified by research investors and end-users.

While this element of the framework is rigorous and requires good judgement, it is simple to use and does not require the user to have particular expertise or knowledge in the research issues at hand.

To identify areas of alignment and gaps, themes are mapped against OEH’s *Knowledge Strategy* (2013-2017) (which sets out environmental knowledge gaps and research priorities).

- **Multiple criteria analysis** that uses a scoring system to rank the short-listed research themes. The NRC believes this element of the framework requires the user to have stronger expertise and knowledge in the research issues at hand to effectively apply scores in the assessment.

This element of the framework is optional, and may be beneficial when there is a ‘longer’ list of competing research themes from the filter analysis.

- **Reflection questions** where the user reflects on the output of the assessment. It requires the users to draw on their experience and judgement and select a final set of priority research themes which are likely to deliver the best possible outcomes.

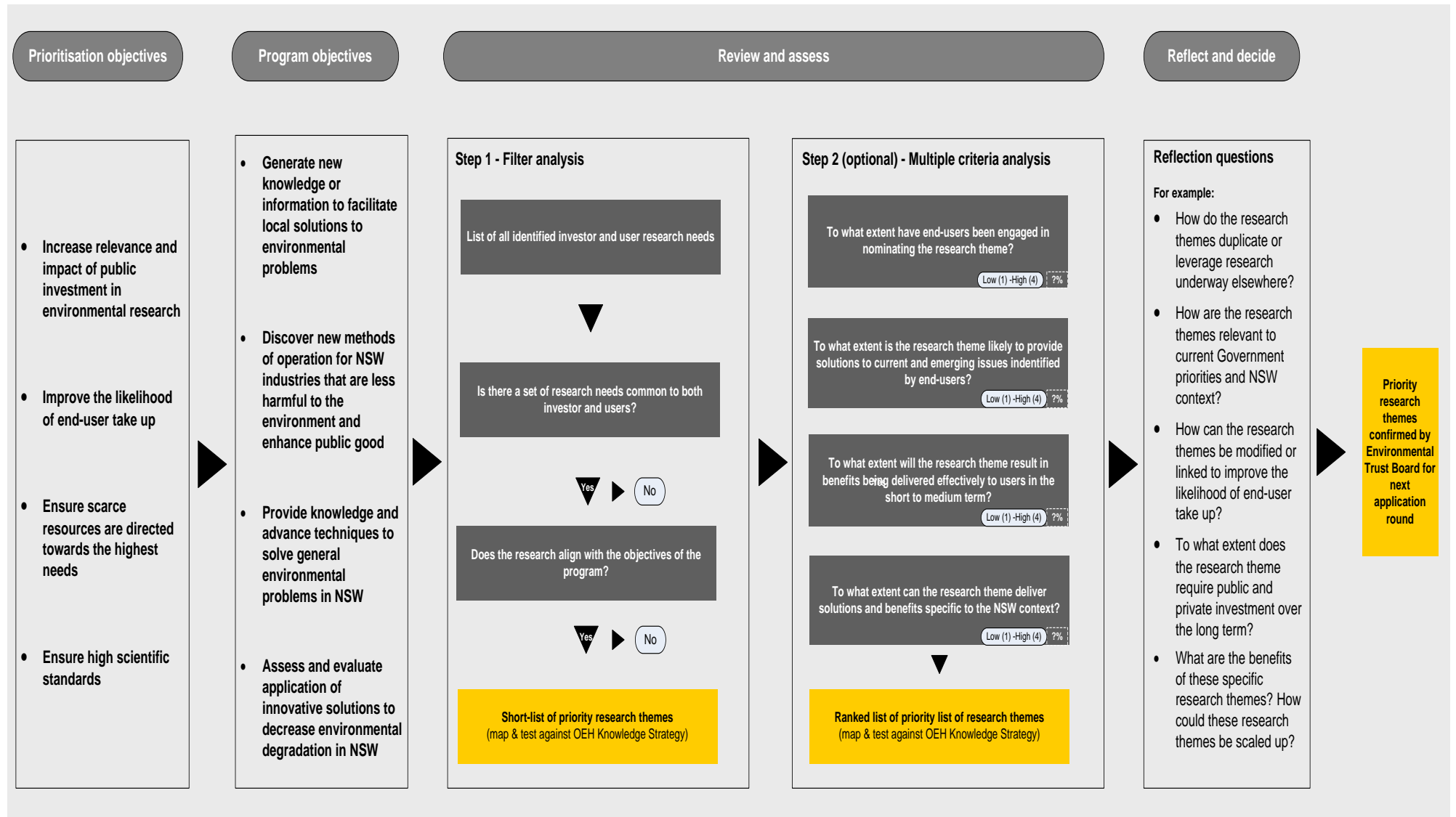


Figure 2: Analytical framework for developing priority research themes.

## 4 Applying the framework

- The NRC has applied the framework, including:
  - a desktop analysis to identify documented investor and end-user research needs (see **Attachment 1** for a full list of organisations selected)
  - targeted consultation through email and phone interviews to identify any further research needs (see **Attachment 2** for a list of investors and end-users consulted)
  - a workshop between the NRC and the Trust, including their scientific technical committee to test thinking and reflect on outputs.
- In consultation with the Trust, the NRC did not apply the multiple criteria analysis component of the framework.

### 4.1 Priority research themes

- The NRC identified a total of 224 potential research themes from the desktop analysis and targeted consultation.
- **Table 1** presents a shortlist of 21 priority research themes (in no particular order) based on the filter analysis.
- **Figure 3** suggests a logical, higher-order grouping of seven research categories for the Trust to consider. Many of the research themes share inherent biophysical and landscape linkages, and potential multiple benefits could be considered when the Trust assesses applications.
- Collaboration, information sharing and capacity building emerged as strong themes both in the short-list and in general feedback provided to the NRC by stakeholders. As such, **Figure 3** identifies these as explicit cross-cutting themes. The NRC suggests these themes should be central to the Trust's expression of interest (EIO) process to ensure the best possible proposal and practical applications.

### 4.2 Limitations and challenges

- The process relies heavily on identifying up-front investor and end-user needs through consultation and documented strategies. However, it is important to strike a balanced view across these data sources to ensure the priorities are not biased in a particular direction (either real or perceived). This challenge will remain if the Trust adopts the process.
- The analysis and consultation undertaken for this work is not comprehensive. For example, a small set of stakeholders the NRC planned to consult were unavailable in the relevant time period for this advice. As a result, some areas such as marine may not be well represented.
- In-line with the Trust's request, the preliminary list of research themes presented in this paper broadens the scope of past priorities. However, they are variable (type and scale) and move into areas such as agriculture. While this presents a more holistic, systems view of the way the landscape is used and functions, there is a risk some stakeholders may perceive the Trust is straying from the program objectives.

**Table 1: Shortlist of priority research themes.**

| Research priorities   |
|---|
| ▪ Adaptation options and community adaptive capacity towards climate change   |
| ▪ Aquatic biodiversity  |
| ▪ Biodiverse terrestrial and aquatic production systems   |
| ▪ Carbon storage potentials in soil   |
| ▪ Decision support systems for local planning and natural resource management   |
| ▪ Ecological water requirements   |
| ▪ Fire regimes  |
| ▪ Health of water-dependent ecosystems  |
| ▪ Impacts of climate change   |
| ▪ Impacts of developments and extractive industries   |
| ▪ Landscape connectivity  |
| ▪ Long-term and integrated management systems for biosecurity   |
| ▪ Methods to assess socio-economic variables and community values   |
| ▪ Methods to engage with, communicate and increase adaptive capacity of communities, including Aboriginal communities |
| ▪ Methods to reduce impacts from hazardous pollution  |
| ▪ Risks to aquatic ecosystems   |
| ▪ Risk mitigation and control methods for biosecurity, including biocontrol and alternatives to chemical controls     |
| ▪ Soil biodiversity   |
| ▪ Soil chemical and physical properties   |
| ▪ Surveillance and assessment tools for new incursions  |
| ▪ Waste treatment and waste reduction technologies  |



**Figure 3: A model for potential research themes.**

The NRC has grouped the identified research themes (outer, light green circles) into seven broader research categories (inner, dark green circles). Many research themes share inherent biophysical and management linkages, offering multiple benefits to end-users and investors. Effective institutional practices such as information sharing, collaboration and capacity building need to be in place to realise these benefits (cross-cutting themes, middle circle).

## 5 Future opportunities

### Continue to engage

- The NRC found many stakeholders value research, and were genuinely enthused to participate and contribute to the NRC's work and the Trust's program more broadly. However, some stakeholders suggested the visibility of the program and its outputs could be improved.
- The NRC believes the Trust has an opportunity to further harness this goodwill and improve the effectiveness of the program. The Trust could employ fit-for-purpose approaches to engage investors, end-users and the broader community from the beginning of the prioritisation process through to program review. For example:
  - develop an engagement strategy, including methods for communicating and disseminating research outputs to end-users and policy makers
  - develop a simple register of all potential research users to maintain further engagement
  - hold targeted workshops, focus groups or periodic surveys to identify research priorities and to provide general feedback on the program
- Engagement with research proponents and previous applicants to the program would also be useful to the Trust to help understand risks and barriers for applicants and any potential duplication or leveraging of other research underway could occur.

### Promote collaboration

- The benefits of collaboration are well known, particularly between researchers, institutions and end-users. It can help leverage time, expertise, material, resources and reduce duplication. Collaboration can also help the outreach of research, making it more portable and applicable to other areas and increase the likelihood of end-user take up.
- Many stakeholders told the NRC they are keen and willing to partner and collaborate on research projects. The NRC suggests the Trust should establish a clear signal on the value of collaboration in the early phases of the program. For example, collaboration (and other cross-cutting themes previously suggested) could be an essential assessment criterion in the Trust's selection processes.

### Invest strategically

- Funding and institutional continuity is important to achieve long-term environmental and natural resource management outcomes. It provides certainty, and allows organisations to forward plan and implement coherent strategies. The same principle applies to the research sector, where fixed priorities and funding over a sensible timeframe provide the research community with the necessary certainty to plan and undertake their work.
- However, investors in research need to strike the right balance to help promote free-thinking and innovation. This environment often provides important 'breakthrough' outcomes for environmental and natural resource management.
- In other cases, important issues and priorities may emerge where a nimble response is needed.
- **Figure 4** outlines a high-level funding model for the Trust to consider. It aims to provide the Trust with a long-term strategic outlook, while allowing a degree of flexibility to adapt. The model suggests:
  - allocating the majority of the funding quantum to a set of priority research themes over a longer-term, fixed period (for example, five years)

- allocating a smaller proportion of the funding to accommodate emerging issues and priorities and promote innovation (for example, biennial)
- This model works best where there is a sufficient pool of investment funds to ensure any split is meaningful and sensible. The Trust could explore other avenues for raising capital. As an example, the *Landcare and Environment Collection* established by NSW Landcare recently raised nearly \$200,000 in crowdfunding for a range environmental projects.<sup>1</sup>

|         |  |   |   |
|---------|--|---|---|
| More \$ | <u>Fixed</u><br>strategic<br>investment    | <b>Allocation of grant funds directed to a set of fixed research themes</b>                     | Allocation fixed over multiple years    |
| Less \$ | <u>Flexible</u><br>strategic<br>investment | <b>Allocation of grant funds directed to promote innovation and address emerging priorities</b> | Allocation revised over shorter periods |

**Figure 4: Potential high-level funding model for environmental research program.**

## 6 Using this advice

- This advice is for the Trust’s consideration and supports decision-making for a final set of priority themes for its 2015 application round.
- However, the priority research themes presented by the NRC in this paper contain limitations as described in section 4.2, such as the limits around the breadth and depth of consultation.
- The NRC suggests the Trust will also need to consider other research funding programs. For example, the NSW Government’s *Saving our Species* program is likely to address particular research needs for threatened species.

<sup>1</sup> See <http://www.pozible.com/collection/detail/109> and <http://www.landcarensw.org.au/news-details.php?nid=15>



## Attachment 1 – Documents reviewed

**Table A1.1: Investor and end-user documents reviewed for research priorities.**

| Organisation   | Document reviewed   |
|--|---|
| <b>BirdLife Australia</b>                                    | <i>Bird Conservation Strategy</i>   |
| <b>Department of Primary Industries</b>                      | <i>Research for Action: Biosecurity, Climate, Fisheries and Ecosystems Research, Productivity and Food Security, Soils and Organics and Water</i> |
| <b>Department of Primary Industries - Biosecurity NSW</b>    | <i>NSW Biosecurity strategy 2013-2021</i>   |
| <b>Department of Primary Industries - Fisheries NSW</b>      | <i>Fisheries NSW strategic plan 2012-2015</i>   |
| <b>Environment Protection Authority</b>                      | <i>Environment Protection Authority strategic plan 2014-2017</i>  |
| <b>Grains Research and Development Corporation</b>           | <i>Strategic research and development plan 2012-2017</i>  |
| <b>Local Land Services</b>                                   | <i>Catchment Action Plans</i>   |
| <b>Meat and Livestock Australia</b>                          | <i>MLA's strategic plan 2010-2015</i>   |
| <b>National Parks Association of NSW</b>                     | <i>Website – Conservation strategy</i>  |
| <b>Nature Conservation Council of NSW</b>                    | <i>Website - Strategic priorities</i>   |
| <b>NSW Farmers</b>   | <i>Policy priorities 2015</i>   |
| <b>OceanWatch Australia</b>                                  | <i>OceanWatch Australia strategic plan 2011-2014</i>  |
| <b>Office of Environment and Heritage</b>                    | <i>Knowledge strategy 2013-2017 and Introducing Saving our Species</i>  |
| <b>Riverina and Murray Regional Organisation of Councils</b> | <i>Strategic and operational plan for the years 2011 to 2015</i>  |
| <b>Sydney Coastal Councils Group</b>                         | <i>Sydney Coastal Councils Group strategic plan 2010-2014</i>   |

## Attachment 2 – Investors and end-users consulted

- Albury City Council
- BirdLife Australia
- Central West Local Land Services
- Department of Primary Industries – Biosecurity NSW
- Department of Primary Industries – Aquaculture and Aquatic Environments
- Environment Protection Authority
- Grains Research and Development Corporation
- Landcare NSW
- Local Land Services – policy, planning and relationships
- Meat and Livestock Australia
- Murray Local Land Services
- National Parks Association of NSW
- Nature Conservation Council of NSW
- NSW Farmers
- Office of Environment and Heritage
- Sydney Coastal Councils Group
- Southern Councils Group