



Northern Australia
Environmental
Resources
Hub

National Environmental Science Programme



Feedback on 'Managing water in the Fitzroy catchment: Discussion paper for stakeholder consultation'

Relevant findings from the National Environmental Science
Program Northern Australia Environmental Resources Hub
project 'Showing and sharing knowledge in the Martuwarra
(Fitzroy River) catchment'

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Cover photograph: Traditional Owners from different groups sharing stories about their Country. Photo: Pia Harkness, CSIRO.

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Acronyms

DAWE Department of Agriculture, Water and the Environment

CSIRO Commonwealth Scientific and Industrial Research Organisation

MFRC Martuwarra Fitzroy River Council

NAERH..... Northern Australia Environmental Resources Hub

NAILSMA North Australian Indigenous Land and Sea Management Alliance

NESP..... National Environmental Science Program

NTD Native Title Determination

PBC..... Prescribed Body Corporate

TO Traditional Owner

Abbreviations

e.g. for example

Acknowledgements

The information presented here is drawn from a peer-reviewed, co-authored publication:

Hill, R., Harkness, P., Raisbeck-Brown, N., Lyons, I., Álvarez-Romero, J.G., Kim, M.K., Chungalla, D., Wungundin, H., Aiken, M., Malay, J., Williams, B., Buissereth, R., Cranbell, T., Forrest, J., Hand, M., James, R., Jingle, E., Knight, O., Lennard, N., Lennard, V., Malay, I., Malay, L., Midmee, W., Morton, S., Nulgit, C., Riley, P., Shadforth, I., Bieundurry, J., Brooking, G., Brooking, S., Brumby, W., Bulmer, V., Cherel, V., Clifton, A., Cox, S., Dawson, M., Gore-Birch, C., Hill, J., Hobbs, A., Hobbs, D., Juboy, C., Juboy, P., Kogolo, A., Laborde, S., Lennard, B., Lennard, C., Lennard, D., Malay, N., Malay, Z., Marshall, D., Marshall, H., Millindee, L., Mowaljarlai, D., Myers, A., Nnarda, T., Nuggett, J., Nulgit, L., Nulgit, P., Poelina, A., Poudrill, D., Ross, J., Shandley, J., Skander, R., Skeen, S., Smith, G., Street, M., Thomas, P., Wongawol, B., Yungabun, H., Sunfly, A., Cook, C., Shaw, K., Collard, T., Collard, Y. (2021) *Learning Together for and with the Martuwarra Fitzroy River*.

Sustainability Science <https://doi.org/10.1007/s11625-021-00988-x>

The research from which these findings are derived was supported by a partnership between CSIRO and organisations representing ten Traditional Owner groups in the Fitzroy River catchment: Bunuba, Gooniyandi, Jaru, Kija (including Ngarrawanji and Yurriyngem Taam sub-groups), Kurungal, Nyikina Mangala, Warrwa, Wilinggin, Yi-Martuwarra Ngurrara and Yungngora Peoples. We would like to acknowledge the fine support of Bunuba Dawangarri Aboriginal Corporation, Gooniyandi Aboriginal Corporation, Tiya Tiya Aboriginal Corporation, Walalakoo Aboriginal Corporation, Wilinggin Aboriginal Corporation, Yanunijarra Aboriginal Corporation, Yungngora Aboriginal Corporation, and the Kimberley Land Council. The research for the article on which this feedback is based was supported with funding from the Australian Government's National Environmental Science Program, CSIRO, James Cook University, and the University of Western Australia. J. G. Álvarez-Romero acknowledges the support of the Australian Research Council. We would like to thank the Traditional Owners and Elders for the opportunity to work together on their traditional lands, and for their outstanding contributions to the project. We acknowledge the assistance of reviewers for their incisive comments on earlier drafts. Coauthor of the above paper Rachel Buissereth was affiliated with CSIRO at the time of the research. The research was conducted under ethics approval 81/16 from the CSIRO Social Science Human Research Ethics Committee.

1. Introduction

1.1 Introduction to the discussion paper

In November 2020, the Western Australian Government released '[Managing water in the Fitzroy River catchment: Discussion paper for stakeholder consultation](#)' (hereafter 'discussion paper').

The discussion paper presents the options and approaches being considered by the Western Australian Government to protect the Fitzroy River and manage the use of water to support sustainable economic development in the catchment. It has been developed by talking to people who live, work and interact with the Fitzroy River and are committed to its future. Written submissions were invited on the paper up until 31 August 2021.

Here we provide feedback on the discussion paper, drawing on the findings of the National Environmental Science Program (NESP) Northern Australia Environmental Resources Hub (NAERH) case study [Showing and sharing knowledge in the Martuwarra \(Fitzroy River\) catchment](#).

1.2 Introduction to the 'Showing and sharing knowledge' case study

The [Showing and sharing knowledge in the Martuwarra \(Fitzroy River\) catchment](#) case study contributed to a [larger project](#) co-led by CSIRO and North Australian Indigenous Land and Sea Management Alliance (NAILSMA). The Fitzroy River case study itself was led by CSIRO in partnership with:

- Bunuba Dawangarri Aboriginal Corporation
- Gooniyandi Aboriginal Corporation
- Jaru Claimant Group
- Kija Claimant Group (including Ngarrawarnji and Yurriyangem Taam sub-groups)
- Tiya-Tiya Aboriginal Corporation
- Walalakoo Aboriginal Corporation
- Warrwa Claimant Group
- Wilinggin Aboriginal Corporation
- Yi-Martuwarra/Yanunijarra Aboriginal Corporation
- Yungngora Aboriginal Corporation.

The Kimberley Land Council played a vital support role, particularly through the Kimberley Regional Research Coordinator, Dr Karen Dayman.

The purpose of the case study, set out in research agreements between CSIRO, the Prescribed Bodies Corporate (PBCs) and Claimant Groups, was to *find better ways to show, share and use Indigenous, scientific and other knowledge in planning and decision-making for adaptive environmental management of the Fitzroy River catchment*.

The Martuwarra (Fitzroy River) connects the 10 major Traditional Owner (TO) groups who were involved in the project (Table 1.1, Figure 1-1a and b). At least nine Indigenous languages are still widely spoken.

Table 1.1. Native Title determinations and organisations of the Traditional Owner groups involved in the project.

^a Group	^b Native Title determinations (NTD) and registered claims	^c Organisations representing the groups' interests
Bunuba	4 NTDs: Bunuba, Bunuba People #2 Part A, Bunuba Part B, Bunuba #2 Part B	Bunuba Dawangarri Aboriginal Corporation
Gooniyandi	3 NTDs: Gooniyandi Combined #2; Yarrangi Riwi Yoowarni Gooniyandi People; Giniyawarni Yoowaniya Riwi	Gooniyandi Aboriginal Corporation; Giniyawarni Yoowaniya Riwi Aboriginal Corporation
Jaru	1 NTD: Jaru	Jaru Claimant Group represented by the KLC
Kija	2 NTDs: Ngarrawanji; Yurriyangem Taam	Kija Claimant Groups (Ngarrawanji and Yurriyangem Taam) represented by the KLC
Kurungal	1 NTD: Kurungal	Tiya Tiya Aboriginal Corporation
Nyikina Mangala	2 NTDs: Nyikina Mangala; Nyikina Mangala #2	Walalakoo Aboriginal Corporation
Warrwa	2 Claims: Warrwa Combined; Warrwa Mawadjala Gadjidgar	Warrwa Claimant Group represented by the KLC
Wilinggin	1 NTD: Wanjina - Wunggurr Wilinggin Native Title Determination No 1	Wilinggin Aboriginal Corporation
Yi-Martuwarra Ngurrara	2 NTDs: Yi-Martuwarra Ngurrara Part A; Ngurrara Part A	Yanunijarra Aboriginal Corporation
Yungngora	1 NTD: Noonkanbah	Yungngora Aboriginal Corporation

^aThe group corresponds to the name of the self-determined nations or Indigenous peoples associated with the noted NTDs or registered claim(s) that overlap the boundaries of the Fitzroy basin (see Figure 1-1). In most cases, the name corresponds with the main language(s) spoken by the group, but not always (e.g. Wilinggin: Ungarinyin, Yi-Martuwarra Ngurrara: Walmajarri).

^bSome groups include several self-identified independent sub-groups recognised by the names of the individual NTD/claim areas, such as the three Gooniyandi and two Kija sub-groups. In other cases, the different native title areas correspond to sections of the lands and waters corresponding to the same group (e.g. Bunuba, Nyikina Mangala), which were claimed/determined at different points in time.

^cThe name of the organisation corresponds to the Registered Native Title Bodies Corporate (RNTBC), often referred to as a Prescribed Body Corporate (PBC) of the group, which have prescribed functions under the *Native Title Act 1993* to hold, protect and manage determined Native Title areas on behalf of the Native Title holders. During the project, Jaru, Kija and Warrwa peoples were represented by their corresponding Native Title claimant groups through their representative body, the Kimberley Land Council. The Wilinggin Aboriginal Corporation is the agent of the Wanjina-Wunggurr (Native Title) Aboriginal Corporation in relation to the interests of the Ngarinyin people and activities on Wilinggin Country, which corresponds to the Native Title area overlapping the Fitzroy basin.

The predominant use of the Fitzroy basin is extensive livestock grazing (currently 81% of the basin), along with small areas of irrigated agriculture (0.05%) and other intensive uses (0.2%) such as roads, housing and mining (Figure 1-1c). Today, most of the basin retains its native vegetation (~99.7%), including almost 10% protected under diverse conservation schemes. Beyond agricultural uses, the local Indigenous customary economy is vital to the 6,000 Indigenous people in the catchment, who live in two major towns (Derby and Fitzroy Crossing) and 48 remote Indigenous communities. The land tenure is primarily Crown leasehold land or reserves, and virtually the entire basin (98%) is subject to Indigenous Native Title rights under the Australian *Native Title Act 1993*. Within this area, Traditional Owners hold exclusive (i.e. possession of an area to the exclusion of all others) and non-exclusive (e.g. access and use the land for fishing, ceremony or camping) rights over 32% and 63% of the basin, respectively (Figure 1-1d). Non-exclusive Native Title rights co-exist with pastoral, conservation and mining interests, which contribute to the complex environmental governance of the region.

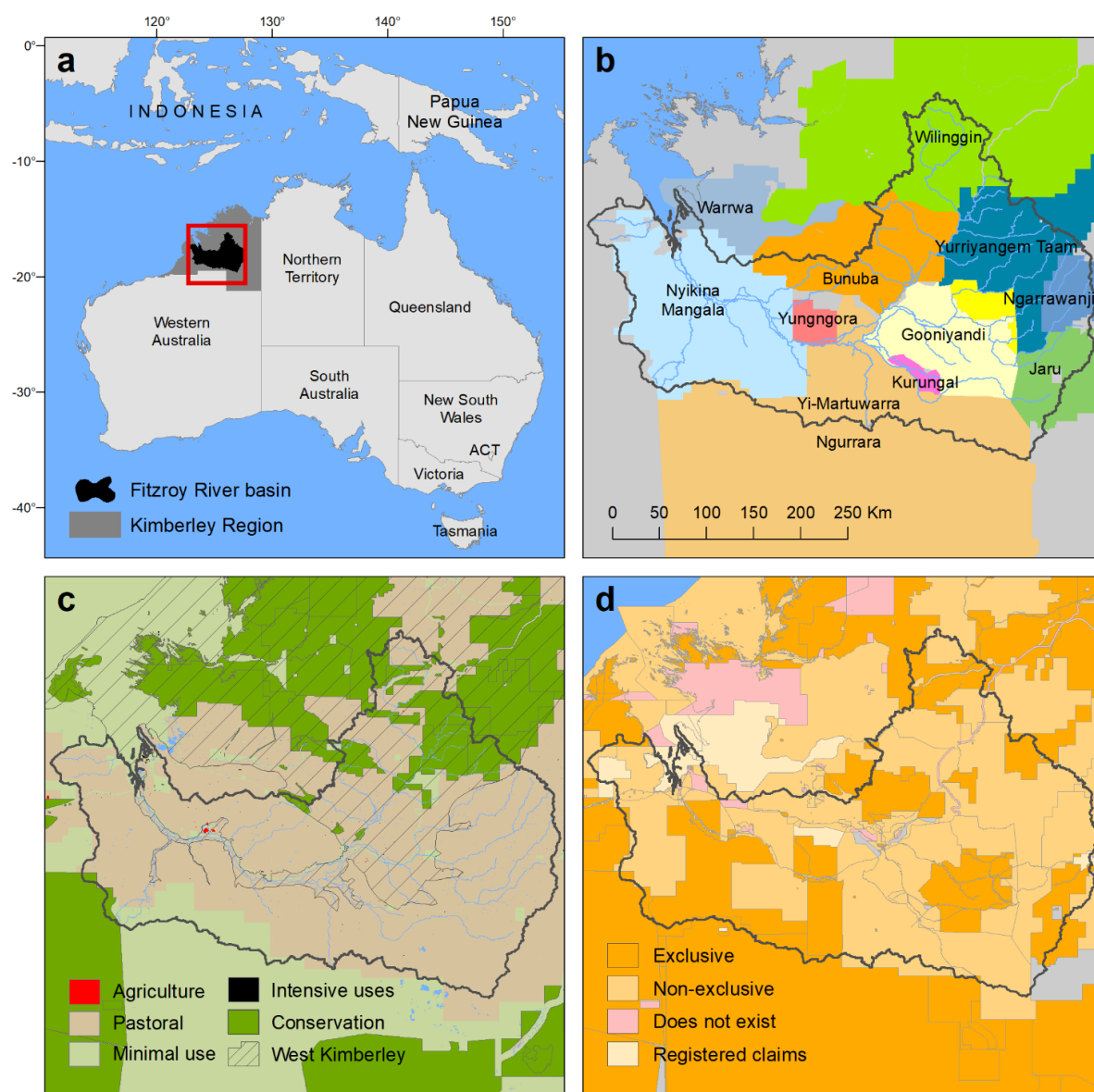


Figure 1-1. Fitzroy River catchment case study area. **(a)** Location of the Martuwarra (Fitzroy River) basin in the Kimberley region of north-western Western Australia; according to Traditional Owners the basin includes the Fraser River, which also drains into the King Sound. **(b)** Land boundaries of the 17 major Traditional Owner groups of the Martuwarra, based on 17 Native Title determinations (see Table 1.1). **(c)** Major land uses, conservation areas and boundaries of the West Kimberley Heritage Place. **(d)** Outcomes of the Native Title determinations, including exclusive and non-exclusive Native Title rights. Data sources: Catchment Scale Land Use Mapping for Western Australia 2008-2017, Collaborative Australian Protected Areas Database 2018, and National Native Title Tribunal Data File Geodatabase (www.nntt.gov.au; data extracted on 11/09/2020); see details in Supplementary Table S1.

1.3 Project activities

The project was developed through an action co-research approach that involved four main activities:

- building a 3-dimensional (3D) physical map of the catchment (Figure 1-2) together with Traditional Owner school children and taking it on a roadshow – the map is now going to be based at the Fitzroy Valley District High School
- using a table-top interactive projector to look at different maps of the Fitzroy catchment (Figure 1-3)
- drawing an influence (community) map showing how different people in the catchment connect over issues
- using the influence map to develop strategies that help deliver goals from the [Fitzroy River Declaration](#).

Action-learning cycles occurred over a four-year period, beginning with a consideration of the research priorities of the Traditional Owner groups in November 2015, and concluding with a final workshop in December 2019 (Figure 1-4)

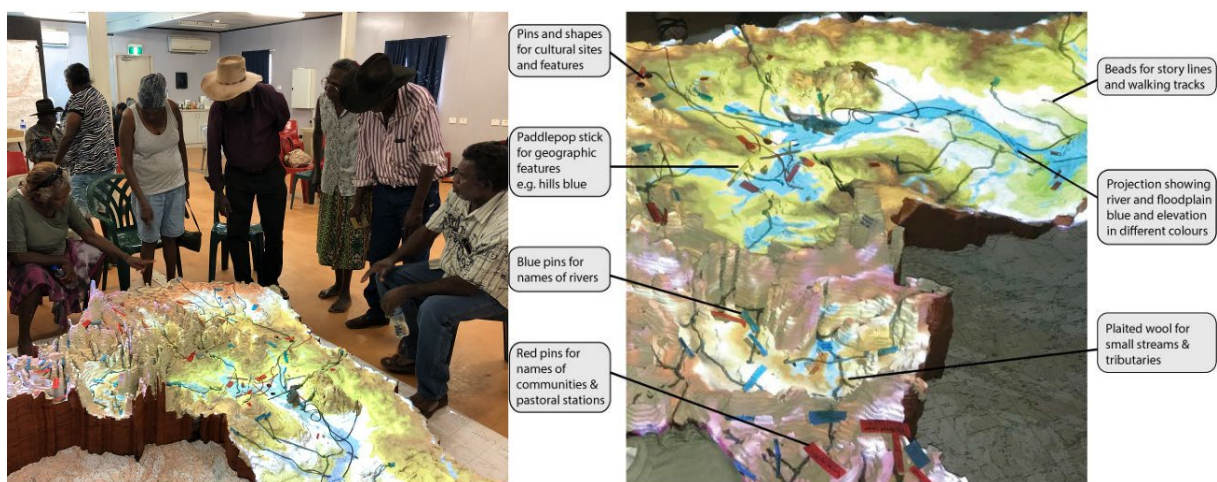
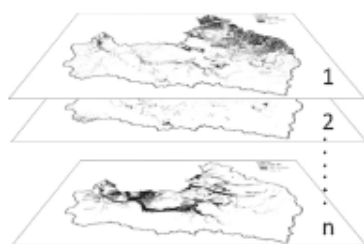


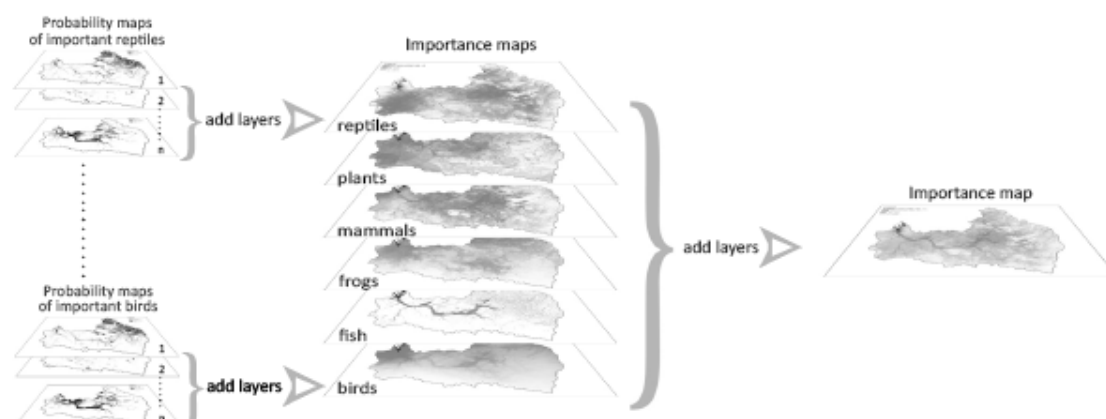
Figure 1-2. Using the 3D physical map of the catchment.



Individual probability maps for local plants and animals were created. Plant and animal probability maps are based on recorded sightings and environmental factors that determine the most likely habitat (e.g. rain and temperature). Probability maps are grids and each cell in the grid has a value ranging from 0, no likelihood of occurrence, to 1, most likelihood of occurrence. They indicate where species are most (dark tones) or least (light tones) likely to be found in the environment.



Interactive projector used to map the important places in the Fitzroy River Catchment based on the density of important species. Probability maps for plant and animals were projected onto the table top. Interactive mapping allowed participants to move map around, zoom into areas for a closer look, and add important features such as the river. to discuss the importance of each local plant and animal. Traditional Owners used this method to determine which plants and animals are important



Sets of important plants and animals were grouped together based on kingdom (plants) and class (reptiles, birds, mammals). Each set was combined by adding together the probability of finding the species. These maps are grids, and spatially referenced, so the grid cells align when maps are layered one on top of another. For example, at one location, the probability of finding an important lizard species is 0.1 and the probability of finding a crocodile there is 0.5. These species are important, and when combined the Importance Value at that location is $0.1 + 0.5 = 0.6$. The higher this value to more important species are at that location. NB Importance Values are not probabilities and can be greater than 1.

Figure 1-3. Traditional Owners working with the table-top projector to identify areas of importance in the Fitzroy catchment.

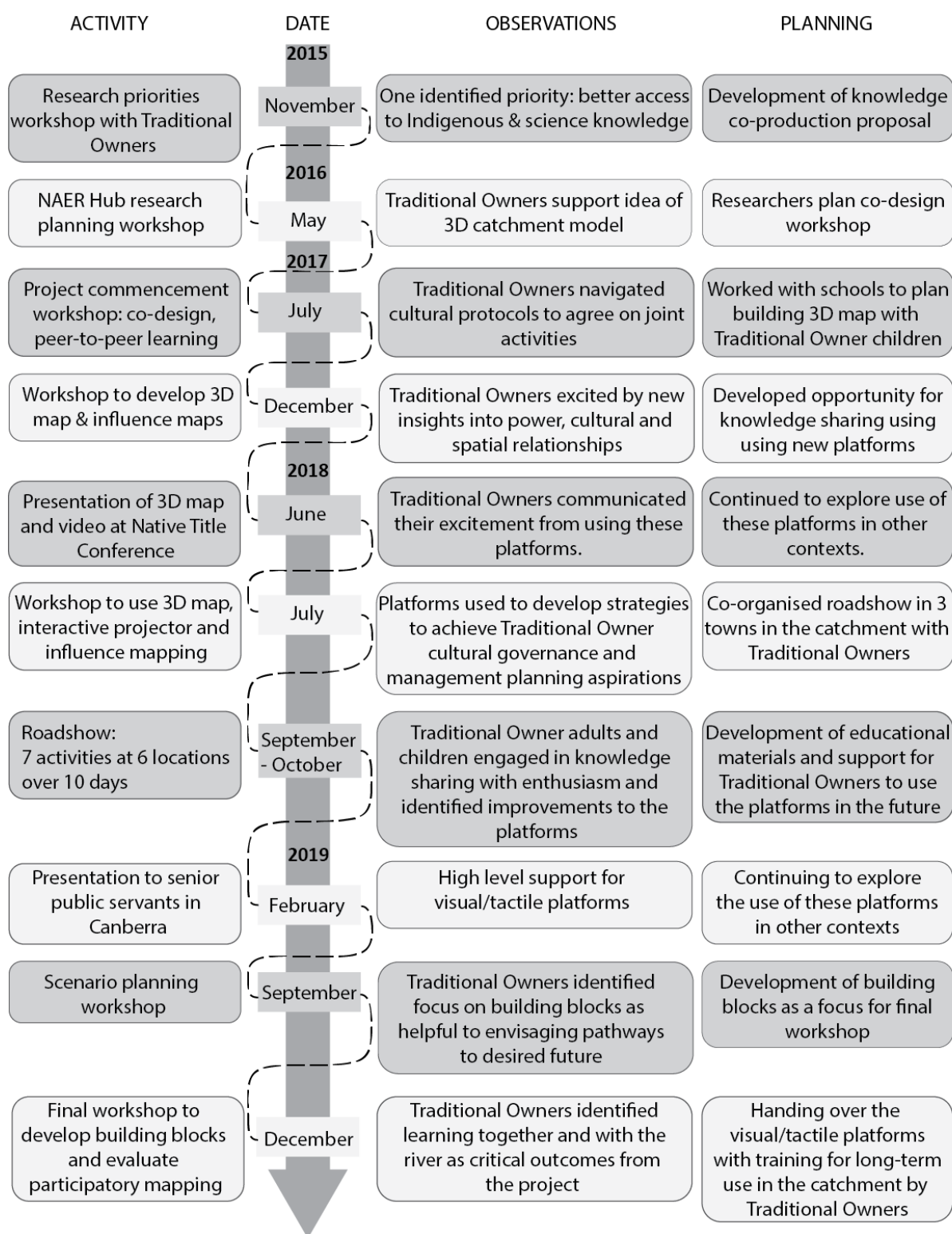


Figure 1-4. Timeline of project activities (NAER stands for Northern Australia Environmental Resources [Hub]).

2. Feedback on the proposals in the discussion paper

2.1 Findings relevant to the proposal for an adaptive management approach

Proposal	Our findings
<p>Establish a Fitzroy advisory group.</p> <p>The State Government is committed to establishing a Fitzroy advisory group. How the group is established, its term of reference and membership will be developed after further consultation.</p>	<p>Indigenous peoples' adaptive environmental management is improved when it is embedded in discussions led by the Traditional Owner organisations and policies that operate through cultural governance e.g., Martuwarra Fitzroy River Council (MFRC) and PBCs (Native Title Representative Prescribed Bodies Corporate).</p> <p>The proposed Fitzroy Advisory Group can benefit from aligning with these institutions and operating through cultural governance and/or co-governance, rather than simply through advice.</p>
<p>Monitoring of water resources, environmental and cultural values will be required.</p> <p>A detailed monitoring program will be designed to closely monitor water, important environment indicators and cultural values in consultation with the community.</p> <p>We will also investigate opportunities for Traditional Owners to be involved in monitoring activities.</p>	<p>Social learning focused on Traditional Owner priorities improves their access to knowledge for adaptive management.</p> <p>The monitoring program can benefit from being based on existing Healthy Country Plans and indicators, and new indicators developed together with Traditional Owners through such Indigenous-led plans.</p>
<p>Future investigations and work will be identified.</p> <p>The water allocation plan will outline the State Government's support for future investigations that help build our shared knowledge and understanding of the Fitzroy River.</p>	<p>Visual/tactile tools – that Traditional Owners can easily look at together, touch and discuss, such as the 3D map and the interactive table-top projector – and different approaches to participatory mapping are good for sharing knowledge.</p> <p>Using such tools in future work for preparation of the Water Allocation Plan will support Traditional Owners' understanding.</p>

2.2 Findings relevant to the proposal for not allowing the Fitzroy or its tributaries to be dammed

Proposal	Our findings
<p>Off-stream water storage infrastructure may be supported.</p> <p>An off-stream dam storing water harvested from a waterway and/or capturing some rainfall run-off, drainage or overland flood waters could be allowed provided it meets all regulatory requirements for protecting cultural and environmental values.</p>	<p>Traditional Owners emphasised that the top and bottom of the river are connected and need to be considered together, by discussions among all the groups, in making decisions. Traditional Owners also emphasised that all of their traditional territories are important e.g., in the words of one workshop participant in July 2018:</p> <p><i>Well I've never seen a TO who sat down, or stood up, or walked long, or slept on, the issue that, you know, one part of their country is important and another part is not important ... every TO's country is important. Every inch of it ...</i></p> <p>Decision-making about whether any off-stream water storage is appropriate, and their potential locations, will benefit from involvement of all the Traditional Owner groups in the catchment, and using relevant spatial data across the catchment. The NESP NAERH project Multi-objective planning in northern Australia assembled an extremely useful data set that will assist these discussions.</p>

2.3 Findings relevant to the proposal for taking groundwater

Proposal	Our findings
<ul style="list-style-type: none"> • Up to 108.5 GL/year of groundwater could be available for allocation. • Restrict abstraction from the alluvial aquifer. • Restrict abstraction from the Devonian Reef aquifer. 	<p>Traditional Owners discussed the need for the 3D map of the Fitzroy catchment to show the underground water systems and their connections with above-ground water.</p> <p>This would be worth further investigation to assist understanding of the impact of various ground water allocations by Traditional Owners. The NESP NAERH project Multi-objective planning in northern Australia assembled an extremely useful data set that will assist these discussions.</p>

2.4 Findings relevant to the proposal that rules could control when surface water harvesting could occur

Proposal	Our findings
<p>Rules could control when surface water harvesting could occur.</p> <p>Strict rules controlling when and how water harvesting could occur could include:</p> <ul style="list-style-type: none"> • no water harvesting during the dry season etc. 	<p>Traditional Owners would like to become more adept at using the rules, policies and law from the government to manage the water.</p> <p>Traditional Owners would benefit from a process that allowed them to learn together with government about these new rules and be involved in setting the rules. Cultural governance and co-governance arrangements can provide Traditional Owners with roles in deciding and applying the rules to make decisions about water allocation.</p>

2.5 Findings relevant to the proposals for providing opportunities for Aboriginal economic development

Proposal	Our findings
<p>Establish a Fitzroy Aboriginal Water Reserve for Native Title holders to use for economic development on their Native Title lands when they are ready to do so.</p> <p>For example, 30% of groundwater (up to 32 GL/year) and surface water (up to 90 GL/year) could be set aside in a strategic reserve.</p>	<p>Traditional Owners are interested in some economic development based on existing economies that use water and require its removal from rivers/aquifers (e.g., pastoralism).</p> <p>They are also very interested in new economies based on management and protection of the natural and cultural resources that use water and mainly require it to be left in the rivers/aquifers. Examples include bush medicines and new materials based on plants like spinifex.</p> <p>Readiness of Traditional Owners to use water reserves will be assisted by better understanding of opportunities to use water for new economies. This can include through extracting water and through leaving it in the rivers and aquifers.</p>
<p>A water licence would be required to access the Fitzroy Aboriginal Water Reserve.</p> <p>To access the Fitzroy Aboriginal Water Reserve, Traditional Owners would have to apply for a water licence like any other user.</p>	<p>Traditional Owners are interested in organisations and policies that place them in a decision-making role about water licences.</p> <p>Applications to a non-Traditional Owner organisation and policy to use water is not supported – Traditional Owners regard the water as belonging to them, and to their Country.</p> <p>Cultural governance or co-governance organisations and policies could offer benefits for ongoing support by Traditional Owners for the water allocation system.</p>

2.6 Findings relevant to the proposals for regulatory requirements for protecting cultural and environmental values

Proposal	Our findings
<p>Best practice engagement with Traditional Owners will be required as part of the regulatory approvals processes.</p> <p>Proponents will be required to engage with Traditional Owners, in line with best-practice guidelines, to identify and assess potential impacts of development on cultural values.</p>	<p>Best-practice engagement recognises the value of Indigenous-led practices and of weaving Indigenous knowledge with science.</p> <p>Traditional Owners appreciated how the data and tools co-developed through this case study as well as the scenarios project can help them assess the impact of developments.</p> <p>However, more investment in collaborative research and assessment is required to make this a reality in response to specific development proposals.</p> <p>Proponents will need to provide substantial resources for supporting data, tools, and capacity to enable best practice engagement.</p>
<p>Development should avoid areas with environmental and cultural values including those already listed under existing legislation.</p> <p>Development proponents should design projects that avoid where possible and protect areas with significant heritage, cultural and environmental values.</p>	<p>As noted at in response to an earlier proposal, Traditional Owners view all of their Country as important and particularly highlight their connections to their Country and responsibilities for its management are the most important aspect.</p> <p>Heritage and cultural values can be effectively protected through participatory processes that place Traditional Owners in a decision-making role, rather than through spatial mapping of areas with significance.</p>
<p>Water licensing requirements will be aligned with requirements of other Commonwealth and State environmental and heritage regulatory approvals.</p> <p>In recognition of the many existing assessment processes in place, the water allocation plan and water licensing requirements will be designed to minimise duplication and complement the requirements of other agencies.</p>	<p>Adaptive environmental management is improved through alignment with Traditional Owner organisations and policies.</p> <p>Licensing requirements can benefit from being embedded in and led by these organisations e.g., MFRC and the PBCs.</p>

3. Further information

More details about the project are available at:

<http://nespnorthern.edu.au/projects/nesp/knowledge-brokering-indigenous-land-management>

Woodward, E., Hill, R., Harkness, P., & Archer, R. (Eds.). (2020). Our Knowledge Our Way in caring for Country: Indigenous-led approaches to strengthening and sharing our knowledge for land and sea management. Best Practice Guidelines from Australian Experiences.

Cairns, Australia. NAILSMA and CSIRO. Online (see pp 87-89):

csiro.au/en/research/indigenous-science/indigenous-knowledge/our-knowledge-our-way

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[Dr Ro Hill profile \(publications, experience\)](#)