



Navigating Knowledge Currents through Kimberley Saltwater Country

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WAMSI Kimberley Marine Research Program

Initiated with the support of the State Government as part of the Kimberley Science and Conservation Strategy, the Kimberley Marine Research Program is co-invested by the WAMSI partners to provide regional understanding and baseline knowledge about the Kimberley marine environment. The program has been created in response to the extraordinary, unspoilt wilderness value of the Kimberley and increasing pressure for development in this region. The purpose is to provide science based information to support decision making in relation to the Kimberley marine park network, other conservation activities and future development proposals.

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Front cover images (L-R)

Image 1: Satellite image of the Kimberley coastline (Landgate)

Image 2: Indigenous Knowledge Group (L-R) (L-R) WAMSI Kimberley Marine Research Program Node Leader Stuart Field (DBCA), KISSP Project Leader Dean Matthews (Senior Project leader Yawuru for the last five years working closely with the state in developing the Yawuru conservation estate plans and the Yawuru Marine Park Plan), Manager Land and Sea Unit at Nyamba Buru Yawuru Julie Melbourne, report author Dr Rebecca Dobbs (UWA), report author Dr Beau Austin (CDU/CSIRO) and WAMSI Kimberley science coordinator Kelly Maples (DBCA) (Image: WAMSI)

Image 3: Humpback whale breaching (Image: Pam Osborn)

Image 4: Indigenous community representatives from the Karajarri and Yawuru peoples meet in Broome to workshop outcomes of the KISSP project at Notre Dame University Hall June 2016 (Image: WAMSI)

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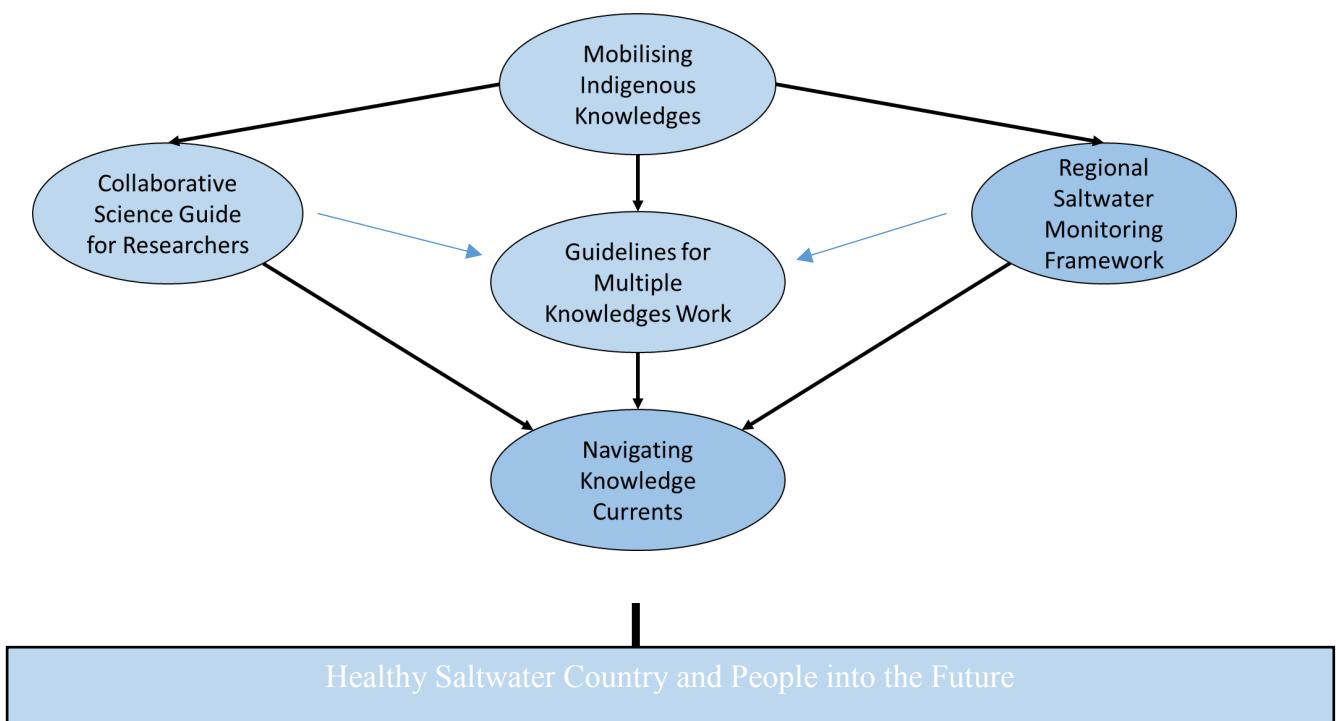


Executive Summary

The Kimberley Indigenous Saltwater Science Project (KISSP) has produced a range of documents that seek to build capacity for collaborative management of Kimberley Saltwater Country (see Table 2 for more detail). In this report we use the insights gathered through the KISSP to guide and support the on-going development of collaborative research, management and monitoring in Kimberley Saltwater Country. To achieve this the KISSP produced seven products:

- 1.5.1 Mobilising Indigenous Knowledges for Collaborative Management of Kimberley Saltwater Country
- 1.5.2 Guidelines for Collaborative Knowledge Work in Kimberley Saltwater Country
- 1.5.3 Collaborative Science on Kimberley Saltwater Country, A Guide for Researchers (*includes links to Kimberley Saltwater Country Research Proposal (Natural & Cultural Resource Management)*)
- 1.5.4 A Regional Framework for Saltwater Monitoring in the Kimberley
- 1.5.5 A Toolbox for Saltwater Monitoring in the Kimberley
- 1.5.6 Pilot training package: Monitoring for Management – A Learning Package for Kimberley Indigenous Rangers

These will be of use to the KISSP Working Group, Traditional Owners, Indigenous Rangers, other Indigenous land and sea managers, researchers, government and non-government organisations (NGOs) for assisting the sustainable development and conservation of regional assets, that optimises social, economic, cultural and environmental benefits to people and Kimberley Saltwater Country.





1. Introduction

The *Kimberley Science and Conservation Strategy* (KSCS) (WA 2011) identified that integrating both Indigenous peoples' knowledge and western scientific knowledge is a key element for ensuring the best outcomes for the management and conservation of the Kimberley coastal and marine environment into the future. As mentioned in the KSCS (WA 2011, p.20):

Immense traditional ecological knowledge has been handed down from generation to generation and this can be used in conjunction with modern science to inform land [*and sea*] management practices and decisions [*our additions*].

As the major strategic document shaping the Western Australian Government's investment in natural resource management in the Kimberley, the KSCS places significant focus on Indigenous perspectives.

The Kimberley Marine Research Program, implemented by the Western Australian Marine Science Institution (WAMSI), has supported the implementation of the objectives of the KSCS through research and capacity building partnerships with Indigenous people as part of an integrated program of 25 research projects in the Kimberley region. One of these research projects, the 'Kimberley Indigenous Saltwater Science Project' (KISSP) was identified to specifically focus on the improved integration of indigenous knowledge into marine conservation management in the Kimberley.

A workshop was held in Broome in October 2014 to engage all Kimberley Saltwater country groups. The outcome of the workshop was the establishment of the KISSP working group with representatives from seven saltwater country groups (Balanggarra, Wunambal-Gaambera, Dambimangari, Bardi-Jawi, Nyul Nyul, Yawuru and Karajarri) who chose to participate in the KISSP. The working group was brought together to guide the completion of the project and to ensure the involvement of the broader saltwater country group communities through engagement and communication of the final products.

The KISSP working group initially identified the following objectives

1. Provide a template for Integration of Indigenous knowledge and management practices into Kimberley marine conservation and joint management.
2. Develop standard and agreed community process and protocols and a research agreement template to underpin marine research in the Kimberley and an implementation strategy to build awareness in the science community of the need for this engagement.
3. a). Develop a framework and protocols for standardising data collection, storage and analysis methodologies that can be used to monitor saltwater country across the Kimberley.
4. b). Develop a training package for agreed research targets for delivery to Rangers to develop internal capacity in these standardised techniques.

The project objectives were identified by the Working Group to ensure a focus on local priorities and aspirations. The objectives sought to address some of the challenges experienced by researchers, Traditional Owners and Indigenous ranger groups when conducting saltwater research and monitoring activities. Following the identification of objectives, the working group assembled a research team. Expressions of interest were sought from research practitioners that were known to various Working Group members based on their experience working with Traditional Owners in the Kimberley region. Through a competitive selection process involving presentations of project proposals, the Working Group decided to appoint researchers from the University of Western Australia (UWA), Charles Darwin University (CDU), Kimberley Land Council (KLC) and Mosaic Environmental jointly as the KISSP research team based on each of their specific skills and capacity..

The research approach for the KISSP was largely defined by the Working Group. Individual, 'On Country' workshops or meetings with Traditional Owners were undertaken to provide an opportunity for each of the seven communities (represented on the Working Group) to have input into the project. Local ranger groups, the KISSP Working Group representatives and the research team designed and organised each of the workshops with local Traditional Owners to maximise the outcomes from each meeting. The KISSP project provided local ranger groups

with sufficient resources to organise and facilitate workshops. Each community decided how the research happened (i.e. workshop or interviews) and ensured that the ‘right people’ were involved in the workshops, which mostly included Traditional Owners, Rangers and Prescribed Body Corporate (PBC) staff.

Date	Traditional Owners	Location	Activity	# Participants
23-24 May 2016	Nyul Nyul	Beagle Bay	Workshop	21
25-26 May 2016	Dambimangari	Derby	Workshop	17
21 June 2016	Balangarra	Kalumburu	Workshop	15
17-20 June 2016	Wunambal Gaambera	Kalumburu	interviews	20
27-28 June 2016	Bardi Jawi	One Arm Point	Workshop	19
30 June- 1 July 2016	Karajarri/Yawuru	Broome	Workshop	23

Table1. Traditional Owner workshops and interviews held under KISSP

In total there were 103 Indigenous participants in five (5) Traditional Owner workshops and one Knowledge Holder interview (Table 1). Workshops were typically held over two days at a location chosen by the relevant Saltwater Group. An informal, conversational style was adopted that allowed sufficient time and discussion between participants. As examples were given they were written down by the researchers on large pieces of paper for everyone to see. This list was checked on numerous occasions throughout the workshops/interviews both for accuracy and to provide opportunity for other related examples to arise throughout the conversation.

All Traditional Owner groups were provided with individual workshop reports and given a period of one (1) month to provide feedback, make amendments, remove information that was considered unsuitable or add anything that was missing. These reports are not publically available, but have been returned to each of the PBCs/Ranger groups who have ownership of the reports.

- 5. In addition to the on country meetings several other research activities were completed to support the engagement of the broader indigenous communities including:
- 6. A review of previous monitoring and evaluation initiatives in the Kimberley,
- 7. A questionnaire to obtain information on current monitoring.
- 8. Online surveys of WSK practitioners who had experience working in the Kimberley region

The Working Group and the research team also had regular phone meetings and face-to-face workshops to ensure a collaborative research approach and to facilitate discussions on saltwater research and monitoring issues at a regional scale. The Working Group provided an important conduit between Traditional Owner groups, their staff and the research community.

The KISSP has produced a number of products that contribute directly to building the collaborative capacity of Indigenous people and their partners to look after Kimberley Saltwater Country (see Table 2). Each of these products has been developed in a manner that creates space for multiple knowledges to be mobilised to support decision-making, management, monitoring and research. By adopting this approach and implementing these tools, the natural and cultural assets of Kimberley Saltwater Country can be protected and/or leveraged to produce social, economic, cultural and environmental benefits for all.

Table 2. KISSP Products produced for each objective (these resources can be accessed at <http://www.wamsi.org.au/research-site/indigenous-knowledge>)

Objective	Product/s
1. Integrate Traditional Ecological Knowledge (TEK) and management practices into Kimberley marine conservation and management.	Mobilising Indigenous Knowledges for Collaborative Management of Kimberley Saltwater Country Guidelines for Collaborative Knowledge Work in Kimberley Saltwater Country
2. Develop standard and agreed community protocols and a research agreement template to underpin marine research in the Kimberley and an implementation strategy to build awareness in the science community of the need for this engagement.	Collaborative Science on Kimberley Saltwater Country, A Guide for Researchers Kimberley Saltwater Country Research Proposal Form (Natural & Cultural Resource Management)
3a. Develop a framework and protocols for standardising data collection, storage and analysis methodologies that can be used to monitor saltwater country across the Kimberley.	A Regional Framework for Saltwater Monitoring in the Kimberley A Toolbox for Saltwater Monitoring in the Kimberley
3b. Develop a training package for agreed research targets for delivery to Rangers to develop internal capacity in these standardised techniques.	Pilot training package: Monitoring for Management – A Learning Package for Kimberley Indigenous Rangers

This report seeks to synthesise the findings of research conducted by the KISSP and to provide guidance and support for the on-going development of collaborative research, management and monitoring in Kimberley Saltwater Country. As the name of this report suggests, new knowledge about Kimberley Saltwater Country will continue to be produced and flow through the region and beyond. These knowledge currents have the potential to follow multiple pathways depending on relationships that emerge and the questions they seek to answer. We hope to shape the contours of these currents so they are collaborative, leverage the knowledge of both Indigenous peoples and scientists, and produce an enriched picture of Kimberley Saltwater Country. The information provided by the KISSP research team will be of specific use to the KISSP Working Group, Traditional Owners, Indigenous Rangers, Indigenous land and sea managers, researchers, governments and NGOs. Its application will assist sustainable development and conservation that optimises social, economic, cultural and environmental benefits to people and Kimberley Saltwater Country.

2. Contributing to Collaborative Capacities in the Kimberley

The KISSP has built on the achievements of Traditional Owners and their partners who have pioneered planning, management and monitoring frameworks that incorporate local Indigenous peoples' knowledges, aspirations and approaches to looking after Kimberley Saltwater Country. There have been numerous collaborative research projects that have sought to mobilise aspects of Indigenous peoples' knowledge in the Kimberley region, particularly those regarding freshwater (Dobbs et al. 2016; Pyke 2017), fire (Bowman and Vigilante 2001;

Vigilante et al. 2009), rainforests (Manggamarra 1991), reptiles and general ecology (Horstman and Wightman 2001). In Saltwater Country there have been comparatively few examples, focusing on threatened species conservation (Jackson et al. 2015; Bayliss et al. 2015) and the cultural values of islands (Vigilante et al. 2013).

Further, there is a comprehensive network of governance arrangements covering the Kimberley in the form of Healthy Country Plans, Indigenous Protected Areas and jointly-managed parks which require collaborative management:

2.1. Indigenous Protected Areas

A network of voluntarily announced protected areas on Indigenous estates have recently been established through the collaboration of local Indigenous peoples and the Australian Government. These Indigenous Protected Areas (IPAs) have planning approaches that; are long-term; clearly articulate Indigenous aspirations for Country; and establish local governance mechanisms that link local Indigenous people to national and international mechanisms for managing social-ecological systems (Smyth 2006; 2015). These IPAs have been fundamental to Australia meeting its obligations to international agreements by ensuring that the National Reserve System effectively protects at least 17% of the terrestrial land mass and, as IPAs become extended to the sea, protect 10% of the marine environment. In the Kimberley there are currently ten IPAs that cover at least 90,000km² (KLC 2014; Yawuru 2017). It is becoming increasingly well-documented that IPAs contribute considerable social, cultural and environmental benefits for local Indigenous people and for the Australian public as a whole (Hill et al. 2012; SVA 2016).

2.2. Healthy Country Planning

An innovative approach to integrating Indigenous and western approaches to looking after Country has been pioneered in the Kimberley region. In 2010, the Wunambal Gaambera People developed the first Healthy Country Plan (WGAC 2010; Moorcroft et al. 2012) based on The Nature Conservancy's Conservation Action Planning (CAP) approach (Carr et al. 2017). The HCP approach is now used across the Australian Indigenous estate with a total of 32 Indigenous groups covering ~65 million hectares of the continent employing the process (Austin et al. 2017). Of the Traditional Owner groups participating in KISSP, all but two have developed HCPs.

2.3. Joint Management

Changes to the State's Conservation and Land Management Act in 2013 provided the opportunity for joint management of conservation reserves in Western Australia. To date there are joint-management arrangements between Traditional Owners in the Kimberley and the Government of Western Australia for marine protected areas that include saltwater country of the Karajarri, Nyungamarta, Yawuru, Dambimangari and Balanggarra people. Of particular relevance to KISSP are the marine protected areas (MPAs) that have been announced, or are being negotiated, for the Kimberley Saltwater Country: Eighty Mile Beach Marine Park; Lalang-garam/Camden Sound Marine Park; Lalang-garam/Horizontal Falls and North Lalang-garam Marine Park; North Kimberley Marine Park; Yawuru Nagalugan/Roebuck Bay Marine Park (for more information, see: <https://www.dpaw.wa.gov.au/parks/management-plans/approved-management-plans>). The establishment of this vast network of MPAs will effectively triple the overall marine conservation estate in Western Australia and increase the capacity of local Indigenous groups to access and manage their saltwater lands and seas. Planning, management and governance of joint-managed MPAs is currently undertaken by the Western Australian Department of Biodiversity, Conservation and Attractions (DBCA) and local Traditional Owners. While there is no clearly defined approach for governing these agreements, this is a quickly changing landscape in which locally-derived approaches are being developed (Yawuru Nagulangun/Roebuck Bay Marine Park [DPAW 2016]).

These collaborative governance arrangements depend significantly on the capacity of Western Science and Indigenous Knowledges to be worked together to produce the best available knowledge-base for making decisions about Saltwater Country that produce social, economic, cultural and environmental benefits for all. While it is still too early to determine the extent to which these integrated approaches help sustain and enhance

local Indigenous ontologic and epistemic practices (Howitt et al. 2012), efforts to advance these intercultural governance mechanisms are undoubtedly a step in the right direction.

Indigenous peoples in the Kimberley retain significant knowledge of how best to look after Country. Governments, NGOs and the private sector have considerable scientific expertise and management experience from which to draw on. Building on these strengths in partnership is logical, and opens opportunities for enhanced management of Kimberley Saltwater Country by mobilising knowledge, practice and governance at both the local and regional scale. The KISSP found that capacity deficits remain in terms of conducting collaborative management, monitoring and research in Kimberley Saltwater Country. However, these deficits mostly exist in an intercultural space rather than in the autonomous institutional processes of any particular actors. That is, the capacity of all stakeholders in Kimberley Saltwater Country to navigate multiple, diverse claims to the collaborative use and management of natural resources remains limited to an extent.

The collective outputs of KISSP adds to an emerging body of work that supports Traditional Owners of Kimberley Saltwater Country, rangers, scientists and their partners to strengthen collaborative governance, mobilise Indigenous Knowledges, co-produce new knowledge and support a regional saltwater monitoring and evaluation framework.

3. Management Implications

In the KISSP reports we have taken current theory and best practice approaches to collaborative research, management and monitoring and developed practical approaches and sets of ‘tools’ for knowledge production and management. The outputs and outcomes will be of interest to Traditional Owners and other local Indigenous people, researchers and anyone that has an interest in looking after Kimberley Saltwater Country (see Table 3).

Table 3. Management implications of the KISSP outputs.

Products	Implications	End Users
Mobilising Indigenous Knowledges for Collaborative Management of Kimberley Saltwater Country	<ol style="list-style-type: none"> 1. Offers examples provided by Traditional Owners of contemporary Indigenous knowledge (IK) for Kimberley Saltwater Country to build awareness and partnerships. 2. Outlines the nature of this IK and key differences to western scientific knowledge (WSK) (especially in terms of application). 3. Describes a process for mobilising IK for enhanced collaborative management capacity of Kimberley Saltwater Country. 4. Provides a framework and process for parallel integration and/or co-production of new knowledge to support collaborative management. 5. Outlines impact pathways for IK and WSK to support decision-making, inform management and design policy. 	Traditional Owners, Indigenous ranger groups, researchers/scientists, natural resource managers, joint-management staff, conservation organisations, governments, commercial interests, and any other stakeholders engaged in collaborative management partnerships.

Products	Implications	End Users
Guidelines for Collaborative Knowledge Work in Kimberley Saltwater Country	<ul style="list-style-type: none"> 6. Allows for integrated management of social, economic, cultural and environmental assets as part of a linked, complex social-ecological system. 7. Provides a platform for monitoring at scale based on information generated through alternative knowledge systems to western science (i.e. IK and other forms of local knowledge). <ul style="list-style-type: none"> 1. Provides clear principles and a stepwise process to ensure Indigenous people and scientists are able to work collaboratively and for shared benefit. 2. This process is triggered whenever research, monitoring or management involves IK and WSK working together. 3. Removes uncertainty and increases confidence of all parties involved in collaborative research. 4. Tailored specifically to meet the needs of Traditional Owners, Indigenous rangers, scientists and others involved in collaborative management of Kimberley Saltwater Country. 	<p>Traditional Owners, Indigenous ranger groups, researchers/scientists, natural resource managers, joint-management staff, conservation organisations, governments, commercial interests, and any other stakeholders engaged in collaborative management partnerships.</p>
Collaborative Science on Kimberley Saltwater Country, A Guide for Researchers	<ul style="list-style-type: none"> 1. Provides western science researchers and their Indigenous research partners with a practical sequence of steps to progress Kimberley saltwater research projects from start to finish. 2. Facilitates collaborative research that meets the needs of all research partners. 3. Incorporates the learnings of researchers with experience working with Indigenous people in the Kimberley region. 4. Provides access to a wealth of experience held by an established network of Indigenous land and sea managers across Kimberley Saltwater Country. 5. Provides a culturally appropriate pathway for researchers to follow. 	<p>Traditional Owners, Indigenous ranger groups, researchers/scientists, natural resource managers, joint-management staff, conservation organisations, government agencies and any other stakeholders involved in natural or cultural resource management research in Kimberley.</p>

Products	Implications	End Users
Kimberley Saltwater Country Research Proposal Form (Natural & Cultural Resource Management)	<ul style="list-style-type: none"> 6. Provides introductory information relevant to undertaking research in the Kimberley. 1. An online research proposal template for research proposals. 2. Provides a mechanism to clearly articulate the information required for decision-making by the local Indigenous community. 3. Assists western scientists to develop human ethics applications. 4. Provides a flexible interface for simple and complex proposals that can be revisited over time by the researcher. 5. Supports development of a research or fee for service agreement. 	Scientists, natural resource managers, conservation organisations, government agencies and any other stakeholders proposing natural or cultural resource management research in Kimberley Saltwater Country.
A Regional Framework for Saltwater Monitoring in the Kimberley	<ul style="list-style-type: none"> 1. Provides a regional monitoring framework designed to address the diverse features and challenges encountered in Kimberley Saltwater Country. 2. Adopts an approach sensitive to the local aspirations, obligations and threats to people and country allowing integration of local issues into a regional context. 3. Facilitates the inclusion of both WSK and IK monitoring to support decision making (i.e. aligns with the multiple evidence based approach). 4. Provides a practical set of steps to address regional monitoring of saltwater country. 5. Highlights the gaps /opportunities /limitations in current monitoring, the tools developed to assist in implementation of the framework and future requirements for local monitoring and the role out of the framework. 	Traditional Owners, Indigenous ranger groups, researchers/scientists, natural resource managers, joint-management staff, government agencies and any other stakeholders involved in research and monitoring in the Kimberley.
A toolbox for Saltwater Monitoring in the Kimberley	<ul style="list-style-type: none"> 1. Presents a range of products or tools to support implementation of the Regional Framework. 2. Supports groups to undertake adaptive 	Traditional Owners, Indigenous ranger groups, researchers/scientists,

Products	Implications	End Users
	<p>management at both the regional and local scale, ensuring questions clearly defined, results analysed, and monitoring and management actions evaluated.</p>	<p>natural resource managers, joint-management staff, government agencies and any other stakeholders involved in undertaking monitoring or developing tools for monitoring and research in the Kimberley.</p>
	<ol style="list-style-type: none"> <li data-bbox="584 399 1108 601">3. Provides a “Toolbox” of monitoring methods for saltwater country that summarises the techniques and tools available and how to access information on these techniques (including data recording, analysis tools etc.). <li data-bbox="584 624 1108 855">4. Highlights the gaps /opportunities /limitations in current monitoring tools providing a clear process for identifying what tools groups are currently using and where researchers can assist in developing new tools to assist rangers with long term monitoring. 	
<p>Pilot training package: Monitoring for Management – A Learning Package for Kimberley Indigenous Rangers</p>	<ol style="list-style-type: none"> <li data-bbox="544 909 1092 1012">1. Provides a training package for Indigenous Rangers on a range of fundamental concepts around marine monitoring practices. <li data-bbox="544 1035 1092 1170">2. Demonstrates how both Indigenous monitoring and western scientific monitoring practices can contribute to an overall monitoring program. <li data-bbox="544 1192 1092 1275">3. Supports Indigenous Ranger participation in monitoring practices and design. 	<p>Indigenous Rangers from the Kimberley region, RTOs, Indigenous organisations, Kimberley TAFE, government agencies.</p>

The KISSP Working Group will continue to work with Traditional Owners, Prescribed Body Corporates, the Kimberley Land Council, Ranger, universities, training institutes and other partners in Kimberley Saltwater Country to continue to build relationships to trial and implement approaches and tools. As is appropriate, the process will be iterative and adaptive and build on the already considerable success in Indigenous land and sea management.

4. Pathways for Enhanced Collaborations

Collaborative approaches to research, management and monitoring of Kimberley Saltwater Country offer several possible benefits:

- Better understanding of this dynamic and complex social-ecological system;
- Optimisation of Indigenous, local, scientific and institutional expertise;
- Better decision-making and policy;
- Better governance linkages from local to regional, to national, and global;
- Potential cost efficiencies, especially when operating in remote areas;
- Enhanced equity through power, responsibility and risk sharing;
- Training, employment and livelihood opportunities for Traditional Owners.

The KISSP has contributed processes and tools to further enhance these benefits for Traditional Owners and their

partners in collaborative management. Additionally, KISSP has proposed a set of pathways to further develop collaborative capacities to access and co-produce the best available knowledge to support looking after Saltwater Country. The following recommendations (Table 4) are designed to be used by knowledge collaborators to guide them through the various knowledge currents flowing through Kimberley Saltwater Country.

Table 4. Identified pathways to enhanced collaborations in Kimberley Saltwater Country.

Knowledge/Practice Gap	Proposed Solutions	Desired Outcome
<ul style="list-style-type: none"> Voluntary adoption of the multiple evidence based (MEB) approach. 	<ul style="list-style-type: none"> Facilitation of dialogue between TOs, Indigenous rangers, PBCs and all other partners. Training to enhance the capacity of TOs and partners to implement and govern an MEB approach, particularly to mobilise IK for collaborations. Development of community-based ‘science prospectuses’. Clearly articulated processes for negotiating access and benefit agreements. 	<ul style="list-style-type: none"> Framework for working with IK and WSK is implemented and producing best available knowledge for decision-making, policy and management.
<ul style="list-style-type: none"> Implementation of collaborative research protocols. 	<ul style="list-style-type: none"> Develop awareness and capacity-building around using the protocols within key user groups (Indigenous organisations, PBCs, agencies and research institutions). Support for an ongoing forum such as KISSP to share knowledge around research and monitoring. Incorporation of the process by institutions into human ethics assessments and joint management processes. Feedback, review, and technical support of the proposal form and ‘Guide for Researchers’. Development of community-based ‘science prospectuses’. Expansion of the protocols into terrestrial Kimberley Country. Incorporation of the research protocols into WA state and federal government processes. Develop national and international ties with other Indigenous groups dealing with similar issues. 	<ul style="list-style-type: none"> Protocols are well understood, supported and applied by western science and Indigenous research partners. Western science and Indigenous research needs are being met, management of Saltwater Country informed and both knowledge systems respected.

Knowledge/Practice Gap	Proposed Solutions	Desired Outcome
<ul style="list-style-type: none"> Implementation of Regional Monitoring Framework. 	<ul style="list-style-type: none"> Resources and support for a regional working group (such as KISSP) to ensure ongoing development and implementation of the Framework and facilitate knowledge sharing. Ownership of the framework is vested in either a working group or with a peak body ensuring the framework is periodically updated in line with HCP updates, and with developments in monitoring and research (ie toolbox updated). Capacity building and training for groups to ensure monitoring is focused on objectives and strategies and incorporates management effectiveness. Support and training to enhance the capacity of Ranger groups to analyse data and interpret results at both a regional and local scale. Development and trial of tools that support multiple evidence based approach (i.e. incorporates both qualitative and quantitative data sets and different knowledge bases). 	<ul style="list-style-type: none"> A robust local monitoring program for Rangers that follows an adaptive management framework and effectively informs the regional framework (with questions clearly defined, results analysed, and monitoring and management actions evaluated). Ranger groups have the capacity to monitor management effectiveness and undertake adaptive management. Ranger groups can express their monitoring and management priorities clearly both locally, regionally and in joint management arrangements. Regional scale analysis of objectives and status of values to inform ongoing management and monitoring of Saltwater Country.
<ul style="list-style-type: none"> Capacity of Indigenous rangers to better understand and participate in monitoring design Identify and test pathways for sharing IK-based information at a regional scale. 	<ul style="list-style-type: none"> Adequate resourcing to deliver the pilot training package and support Indigenous knowledge brokers to help train. Trial, review and refinement of the package format and content. Extension of modules to introduce additional scientific concepts and design. Consultation and dialogue between Indigenous knowledge holders and their representative organisations on options for working IK at larger-than-local scales. Development of 'meta-level' 	<ul style="list-style-type: none"> Indigenous Ranger groups understand the core concepts behind monitoring program design and how western and Indigenous science complement each other for an enriched picture of ecosystem health. Providing a pathway for IK to influence decision-making, policy and management at regional scales (including global).

indicators and monitoring
approaches

Knowledge/Practice Gap	Proposed Solutions	Desired Outcome
<ul style="list-style-type: none"> Explore potential for participatory research to bridge IK and WSK 	<ul style="list-style-type: none"> Field test participatory tools for monitoring of status and trends in Kimberley Saltwater Country. Test accuracy, rigour and legitimacy of results. 	<ul style="list-style-type: none"> Identification of when it is desirable/feasible to employ participatory research. Development of Standard Operating Procedures (SOPs) for participatory research in the Kimberley.
<ul style="list-style-type: none"> Demonstration of effectiveness of collaborative knowledge work 	<ul style="list-style-type: none"> Work with TOs, PBCs, Rangers and all other partners to conduct an evaluation of the benefits of using collaborative approaches to research, management & monitoring. 	<ul style="list-style-type: none"> Evidence to increase visibility of collaboration to produce best outcomes for Country. Increased investment and policy support for collaborative approaches to research, manage and monitor.

4.1. Voluntary Adoption of Multiple Evidence Based Approach

Voluntary agreement making is fundamental to good partnerships in post-colonial contexts. For example, adopting the position of legal pluralism has been crucial to acknowledging Indigenous peoples' rights to land through mechanisms such as Native Title in Australia (Bavikatte and Robinson 2011). In a similar way, though focused on pluralistic and decentralised governance frameworks, the Indigenous Protected Areas programme operates using voluntary agreements. It is the voluntary nature of these agreements that are fundamental to their success.

In much the same way, if the MEB approach is to be implemented in Kimberley Saltwater Country, it must be through a voluntary process. Dialogue between Traditional Owners, Prescribed Body Corporates, the KLC, Indigenous rangers, and all partners, including governments, research institutes, academics among others, in collaborations needs to be established to discuss the usefulness and applicability of the approach. This may be an important task of the KISSP Working Group going forward, or could be facilitated through the KLC as the regional governance body.

If it is agreed (by some or all) that the MEB is a useful tool for framing collaborative knowledge work based on Indigenous knowledges and western science, training will be required to ensure that PBCs, Rangers, the KLC, governments, NGOs, research institutes, academics among others have the intercultural capacity to implement the approach effectively and efficiently.

Further, the dialogue will need to include a discussion of how to address the tricky, though doable, task of articulating Indigenous knowledges, practices and beliefs to the regional scale. There is a need to make IK matter at larger than local scales while avoiding the loss of legitimacy among knowledge holders as well as decision makers across governance scales. However, given their deep embeddedness in the local, a shared history of colonisation, and the highly heterogeneous social and cultural make up of local communities and their environments, Indigenous knowledges are difficult to 'scale up'. Scaling up is highly dependent on complementarities and relationships across 'locals' and varies depending on the issue being discussed, definitions of key terms, and the nature of identified outcomes. Connections between neighbouring Traditional Owner groups of the Kimberley means that some knowledge-practices-beliefs are shared or related, however

this is not necessarily always the case, and where complexities in variation and diversity exists among Kimberley Saltwater Country Traditional Owners, this must be acknowledged. As such, attempts at doing knowledge collaborations at scale must proceed with significant caution, ensuring free prior and informed consent in every step of the process, as there is significant risk involved for Indigenous people. Co-production of meta-level indicators and monitoring approaches could be developed through dialogue between Indigenous knowledge holders and their representative organisations. For example, local data on the status and trend of local Indigenous language use could be reported at a regional level using simple indicators developed through participatory methods. If possible and supported, this would provide a clear pathway to influence decision-making, policy and management at the regional scale across the Kimberley.

There is a potential role for the development and implementation of participatory monitoring tools to work as bridging mechanisms between western science and Indigenous knowledge systems (Austin et al. 2017). However, these tools need further testing in the field to test accuracy, rigour and legitimacy of results from both Indigenous and scientific perspectives. If proved to be useful, Standard Operating Procedures (SOPs) could be developed to support rangers and Traditional Owners to implement the methods for saltwater monitoring, research and management.

To further support the development of a regional MEB approach to research, monitoring and management of saltwater Country, there are three discrete projects that could be invested in:

1. **Development of ‘knowledge prospectuses’ by PBCs and/or Rangers.** The goal of these prospectuses would be to highlight the knowledge gaps local Indigenous people have for Country and the type of scientific support they would like to receive to create new knowledge to support decision making and management of Country.
2. **Consolidation of Indigenous knowledge.** For knowledge prospectuses to be created, Traditional Owners, their PBCs and Indigenous knowledge holders themselves need to have the space, time and resources to properly take stock and consolidate the wealth of knowledge in their communities. This could involve the development of a range of communication products, especially for local schools, that assists in intergenerational knowledge transmission. Without this investment however, it is very difficult to engage as equals with western scientists, and probably impossible to clearly articulate local knowledge gaps and collaborative knowledge production opportunities.
3. **Clearly articulated access and benefit sharing agreements.** One of the difficult tasks of negotiating collaborative research, monitoring and management agreements is deciding who has access to Country, who has access to knowledge, who benefits and how do they benefit. There has been considerable advances made by Indigenous peoples throughout the world on outlining access and benefit sharing protocols in the context of bioprospecting and commercialisation (Bavikatte and Robinson 2011). However, the same is necessary in the context of collaborative knowledge production if an MEB approach is to be optimally implemented.

By following a dialogue-based process, and investing in intercultural capacities as described above, the MEB approach could be voluntarily implemented at the regional scale. This would go some way to ensuring that Indigenous knowledge systems and western science are both mobilised to produce the best available knowledge for decision-making, policy and management to look after Kimberley Saltwater Country.

4.2. Implementation of Research Protocols through PBCs and Research Institutions

Successful implementation of the research protocols will require a shift in organisational practice of both western science (institutional) and Indigenous management bodies. This in turn will require investment in awareness-raising and capacity building. Some of this work has already been done through KISSP, however this should be considered the start of a larger body of work required for ongoing adoption of the protocols. The next key steps are listed below under each of the major stakeholder groups to which they most apply:

Aboriginal organisations and representative bodies

- Provide internal staff training about the protocols and include in new staff inductions.
- Develop training materials for PBCs on identified knowledge gaps around research and monitoring

concepts and processes.

- Resource and provide organisational support for a regional forum to share knowledge around research and monitoring and related issues between saltwater communities.
- Expand the protocols into terrestrial Kimberley Country, if/as directed by terrestrial PBCs.
- Invite key decision makers from major stakeholder agencies onto Country to undertake tailored cultural awareness or cultural competency courses.
- Partner with other national and international Indigenous groups to develop recognition and support for the protocols and Guidelines
- Provide support to the regional Indigenous Protected Area and Ranger Coordinators for their role as regional first points of contact in the new research process
- Develop peer reviewed academic papers around the KISSP project outputs to boost credibility of the group and its outputs.

Research institutes

- Raise awareness of the protocols within key research institutes with an interest or presence in the Kimberley.
- Incorporate the protocol into standard internal university processes for all researchers considering Kimberley cultural and natural resource research projects.
- Consider the implications of these protocols to human ethics assessment processes.
- Partner with Aboriginal organisations to develop peer reviewed academic papers around the KISSP project outputs to boost credibility of the group and its outputs.
- Incorporate the protocol and Guidelines into university course modules to encourage early adoption by post graduates in areas where the protocol has been accepted by local groups.

Government agencies

- Reflect the requirements of the research protocol in both philosophical and pragmatic terms within regional Joint Management processes.
- Key government agencies involved in saltwater Country management or research to be aware of the protocols and the benefits of applying them to their management objectives
- Engage with key management authorities (e.g. Department of Biodiversity, Conservation and Attractions, Department of Primary Industries and Regional Development, the Western Australian Museum) to raise awareness, and support incorporation of the protocols within their assessment and licensing processes.

In order to achieve the lasting level of cultural, procedural and institutional change needed to make the protocols developed through the KISSP project successful, there is a considerable amount of work yet to be done. While these can be prioritised and progressed in a stepwise fashion over time, there is a level of resourcing that remains to be met. Ultimately, adoption of the protocols by partners will require investment into, and establishment of a regional Indigenous saltwater advisory group to provide a conduit between western saltwater science and Kimberley Indigenous communities, a sounding board for research ideas and a group committed to work together to affect the level of change required.

4.3. Implementing the Regional Monitoring Framework

The Regional monitoring framework is based on a common adaptive management approach, allowing for knowledge acquired from local monitoring processes to be incorporated into a broader regional planning and management framework (increasing the relevance and benefits). Although Rangers are involved in a significant amount of local monitoring, a review of this monitoring highlighted areas where capacity building and support are required. As monitoring is only one of many activities undertaken by Rangers, many groups have limited capacity, time and resources to develop adaptive monitoring plans and assess their monitoring activities.

More specifically groups will require capacity building, training and support to:

- Ensure monitoring is focused on objectives and strategies and incorporates management effectiveness.
- Enhance the capacity of Ranger groups to analyse data and interpret results at both a regional and local scale.

This will enable groups to identify whether they are managing threats effectively and ensure that time and resources are being efficiently allocated (adaptive management).

Following a trial of the framework, and a review of current monitoring and research in the Kimberley, a number of tools were developed to support implementation of the framework. These tools will need to be updated periodically to align with any changes or updates in HCPs and future monitoring and research programs. It is therefore essential that ownership of the framework is vested in either a working group or with a peak body. Implementation of the Regional Monitoring Framework will rely on a regional working group (such as KISSP) to ensure its ongoing development and implementation. Throughout the development of the framework, the KISSP working group provided an essential forum for knowledge sharing. A regional working group will help develop the capacity of ranger groups to undertake adaptive monitoring, and ensure both the implementation of the framework and the success of a regional monitoring approach.

To further support the implementation of the framework there are a number of discrete projects that could be invested in:

- Development and trial of tools that support the Multiple Evidence Based (MEB) approach (i.e. incorporates both qualitative and quantitative data sets and different knowledge bases). We have proposed the MEB approach for research and also monitoring but this needs to be trialled as it is a new concept.
- Build on the work being undertaken by Yawuru and DBCA to develop a best practice regional prioritisation process for monitoring and management in the Kimberley region that incorporates priorities from multiple stakeholders i.e. encompasses ecological, cultural and social values.
- Assess whether the current tools and indicators proposed for monitoring marine values are sensitive to changes (threats) currently being experienced across the region
- Identify and develop tools or protocols that can support Traditional Owner groups to store, analyse and interpret their monitoring data (ensuring that we don't move the knowledge production, further away from Traditional Owners and potentially disempower them).
- The source of funding (WAMSI) and subsequent project design (by the Working Group) limited the focus of the Regional Monitoring Framework to saltwater. Saltwater monitoring is only one part of the monitoring and management that Rangers undertake to look after Country and therefore the framework could be expanded to incorporate all aspects of Country. This would enable groups to prioritise monitoring based on all of their HCP objectives and strategies, and allow groups to undertake a realistic assessment of the capacity and resources they have available for monitoring activities.

4.4. Capacity of Indigenous rangers to better participate in monitoring design

Embedded within several other key gaps identified herein, there are a series of needs arising from the development of a pilot training package for Indigenous Rangers. Initially, these are concerned with resourcing delivery and thereafter extending on the package to develop further modules in a stepwise system:

Resourcing

- Adequate resourcing to provide the pilot training package remotely
- Logistical support to enable identified Indigenous knowledge brokers to attend some training sessions where multiple-knowledge work is being discussed
- Review of the package annually

Extension

- Extend the package to complete the set of introductory modules around foundational scientific concepts
- Add a more advanced module based on designing a monitoring program in partnership with a western scientist specialist in the selected local monitoring theme
- Map the modules into accredited training where appropriate

4.5. Evaluation of Collaborative Approaches to Research, Management & Monitoring

There is a need to work with Traditional Owners, Prescribed Body Corporates, Rangers and all of their partners to conduct an evaluation of the benefits of using collaborative approaches to research, management & monitoring. This evaluation would have multiple outcomes, including:

1. Clearly articulate the benefits of collaborative approaches for Indigenous people, the research community, and broader society in general.
2. Demonstrate the effectiveness of multiple evidence-based approaches at producing integrate environmental, social, cultural and economic benefits for Country.
3. Increase the visibility of successful collaborations.
4. Increase investment and policy support for further collaborations between Indigenous people and the science community.

5. Communication

5.1. Proceedings/Technical Reports

Austin, B.J. et al (2017) *Guidelines for Collaborative Knowledge Work in Kimberley Saltwater Country*. Final Report of project 1.5 the Kimberley Indigenous Saltwater Science Project (KISSP). Prepared for the Kimberley Marine Research Program, Western Australian Marine Science Institution,.Perth, Western Australia.

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Lincoln, G. et al (2017) *Collaborative Science on Kimberley Saltwater Country - A Guide for Researchers V17.03*. Prepared by the Kimberley Land Council for project 1.5 the Kimberley Indigenous Saltwater Science Project (KISSP). Prepared for the Kimberley Marine Research Program, Western Australian Marine Science Institution,.Perth, Western Australia.

5.2. Submitted manuscripts

Article in the Kimberley Societies' 2017 publication (currently in late pre-publication stage):

Lincoln, G. et al (2017) *Right-way research: The Kimberley Indigenous Saltwater Science Project*, 'Natural World of the Kimberley', Kimberley Society, Perth

5.3. Presentations

The KISSP working group leadership team and researchers have all been actively involved in developing and providing numerous presentations that raise awareness of the project aims and outcomes with targeted audience's representative of the major stakeholders in Kimberley saltwater sciences. These include:

- Austin, B. Dobbs R.J., Mathews D (2017) Kimberley Indigenous Saltwater Science Project November 16th DBCA Lunch and Learn Seminar, Perth 2017
- Austin, B. and Wiggan A. (2017) Mobilising Indigenous Knowledge for Collaborative Management of Kimberley Saltwater Country. WAMSI Kimberley Marine Research Programme Conference, November 15 2017 Perth, Australia
- Dobbs R.J., Mathews D. (2017) A Regional Framework for Saltwater Monitoring in the Kimberley. WAMSI Kimberley Marine Research Programme Conference, November 15 2017 Perth, Australia
- Lincoln G (2017) Overviewing a new draft process for land & sea research on Kimberley saltwater Country. Indian Ocean Marine Science Institute, April 2017 Perth, Australia
- Mathews D (2016) Kimberley Indigenous Saltwater Science Project. Kimberley Society Conference, 15 October 2016, Fremantle, Australia
- Mathews D, Pearson L and Munro J (2017) Working together on country for healthy country and MPA management. Western Australian Marine Science Institute, 15 November 2017, Perth, Australia
- Mathews D and Wiggan A (2017) People and Saltwater Country in the Kimberley. WAMSI Kimberley Marine Research Programme Conference, November 15 2017 Perth, Australia
- Mathews D., Wiggan A., Austin, B., Dobbs R.J., (2017) Navigating Knowledge Currents in Kimberley Saltwater Country November 15 2017 Perth, Australia
- Oades D (2016) Right-Way Research on Kimberley Saltwater Country. Indigenous Biocultural symposium, Ecological Society of Australia Conference, 22 November 2016 Perth, Australia
- Oades, D and Dobbs R (2016) Kimberley Indigenous Saltwater Science Project (KISSP) bringing Traditional Knowledge and western science together to support the management of Kimberley saltwater country. Healthy Country Forum, 2016 Mt Barrett, Australia
- Oades D and Field S (2017) Furthering sea country research through advancing Indigenous collaborations with marine scientists. Indigenous Workshop, Australian Marine Science Association Conference, 7 July Darwin, Australia.

KISSP working group phone meetings were held monthly from Feb 2016 – October 2017 to maintain communication between the working group members and the research group, with guest speakers from a range of science disciplines.

Four major project workshops of two to three days duration were held in Broome:

- **Project Planning and Implementation Workshop, February 2016.** This was the first opportunity the Working Group members and the Research Team had to sit together to share ideas on methods, workshop facilitation, logistics and design a project work plan. PowerPoint presentations used by UWA and CDU are available on the KISSP project database for more details.
- **Mid-Term Project Workshop, October 2016.** Researchers were tasked with providing the results and preliminary analysis of the On Country workshops and any other parallel research activities taking place within the KISSP. This provided an opportunity for the Working Group members to individually and collectively assess the results and provide recommendations for: presentation of results; and process for seeking feedback from communities and stakeholders.
- **Final Working Group Workshop, June 2017.** The KISSP Research Team presented draft reports to the Working Group for feedback and recommendations. Each of the project outputs was presented and a discussion had about how best to ensure that these products were going to be implemented and maximise the legacy of KISSP. Specifically, the integration of the KISSP products in the current topic of joint management arrangements in Kimberley saltwater country was discussed.

- **KISSP Community and Stakeholder Workshop, November 2017.** This workshop was a final celebration of the achievements of KISSP and through communication of the project outputs and achievements to the wider Kimberley saltwater community. The KISSP project provided support to Traditional Owner groups and their representatives to attend the workshop and other stakeholders in collaborative management (such as DBCA, Fisheries, researchers, etc.) were invited to attend. The KISSP Working Group presented the history and results of the project and members of Research Team took people through the detail of the research outcomes. Several of the WAMSI project leaders presented the findings of their projects which ran in parallel with the KISSP and involved many of the Indigenous ranger groups across the region.

5.4. Other communications achievements

As part of the foundational knowledge sharing process for the project, a series of five on-Country workshops and one community survey, involving over a hundred participants from seven Indigenous Kimberley saltwater communities were held in mid-2016:

- Balanggarra (June)
- Wunambal-Gaambara (June)
- Dambimangari (May)
- Bardi Jawi (June)
- Nyul Nyul (May)
- Yawuru & Karajarri (July)

6. Conclusion

The KISSP project has produced a range of documents that seek to provide a pathway for building capacity for collaborative management of Kimberley Saltwater Country (see Table 2 for more detail). This report provides a provides an overview of the findings of each of the subsections for the KISSP project to guide and support the on-going development of collaborative research, management and monitoring in Kimberley Saltwater Country.

This information will be of specific use to the KISSP Working Group, Traditional Owners, Indigenous land and sea managers, researchers, academic institutions, government agencies and NGOs for ensuring sustainable development and conservation that optimises social, economic, cultural and environmental benefits to people and Kimberley Saltwater Country.

Formation of the KISSP Working Group has resulted in significant benefits for Saltwater Country Traditional Owners, such as:

- sharing research projects,
- new monitoring techniques,
- management strategies, and
- outcomes and learnings associated with joint management issues.

To navigate knowledge currents in the future requires continued investment in a regional working group to provide a conduit between Indigenous knowledge holders, Traditional Owners, researchers, managers and policy makers concerned with ensuring that Saltwater Country and People are healthy long into the future.

For research, management and monitoring efforts in Kimberley Saltwater Country to truly mobilise IK and create opportunities for co-produced knowledge, the capacity of actors to engage in good-faith, intercultural partnerships and institutions needs to be taken seriously. It requires that collaborative approaches to knowledge production and associated practices operate to satisfy local Indigenous peoples' requirements and mechanisms for accountability and, in parallel, meet standards of rigour and credibility required of western scientific disciplines. Working with, between, across and through the intercultural space requires perseverance and trust, both elements of good-faith approaches.

7. References

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8. Appendices

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All reports listed in this appendices can be found at www.wamsi.org.au/indigenous-knowledge