



The Iconic Dingoes of K'gari-Fraser Island -communicating for their future: Report prepared for the Fraser Island Dingo Research Program, Queensland Department of Science, Information Technology, Innovation and the Arts, 2016

Archer-Lean, Clare; Wardell-Johnson, Angela; Carter, Jennifer; et.al.

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The Iconic Dingoes of K'gari-Fraser Island - communicating for their future:

A Report prepared for the Fraser Island Dingo Research Program, Queensland Department of Science, Information Technology, Innovation and the Arts, 2016.



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1. Executive summary

The dingoes on K’gari-Fraser Island are iconic, earning their status through being apex predators within the ecology of the Island and through deep-time associations with the Indigenous Australian traditional owners (Daniels & Corbett 2003; Smith & Litchfield 2009). The perception of their status as symbols of ‘wild Australia’ holds cultural significance to visitors (Hytten 2007) and this value is exploited by the local tourist industry. At the same time, long-established debates over responses to dingo-human incidents remain unresolved, with ongoing vexed media representation of current management strategies (Grewal 2015; Perets 2016). The system of human values that frames human interactions is twofold: the dingo is visible and interacting with human beings, yet wild and therefore dangerous. This tension is the reason for this research. The Queensland Parks and Wildlife Service (QPWS) is vested with responsibility for managing human-dingo interactions, and this report provides insights into the way different sectors value dingoes and how communication on safety is applied by people on the Island.

This report provides a review of diverse literature with insights from international perspectives on similar park situations. The research includes a qualitative, thematic analysis of visitor survey and stakeholder focus groups to offer new perspective and insights into issues that frame communication of Queensland Parks and Wildlife Service’s (QPWS) *dingo-safe*¹ message. QPWS has commissioned numerous reports and reviews of various issues concerning dingo management to provide a well-established knowledge of the K’gari-Fraser Island context. While this report draws on previous reviews, it provides new insights drawn from evidence-based research with concrete potential for application.

The report is divided into five sections. It begins with a comprehensive literature review of international approaches to human dimensions of dangerous animal management². Through discussion of wildlife park management and communication strategies, and innovations from the African and North American contexts, the literature review seeks to establish benchmarks in social engineering and people management through discussion of Kruger National Park and Yellowstone National Park. It will excavate various innovations from the North American context that QPWS may consider useful. The review also teases out some of the anomalous contextual issues in the K’gari-Fraser Island context and begins consideration of how these might be reframed.

Secondly, current stakeholder positions are described to articulate community tensions and opportunities. Thirdly, the communication media currently in use by QPWS, providing the public and other stakeholders with information and advice, is briefly described and

¹ For the *dingo-safe* message see <http://www.nprsr.qld.gov.au/parks/fraser/dingo-safe.html>

² There are a few articles in *Human Dimensions of Wildlife Management Journal* and a thorough text entitled *Human Dimensions of Wildlife Management* (2012) edited by Decker et al that provides an excellent overview of many of these matters.

evaluated. The report then examines some of the key issues and opportunities inherent to the messages themselves and provides a preliminary insight into new forms of engagement with stakeholders to improve QPWS community relations.

Finally, overall findings and recommendations are presented in detail, drawing out themes dominating each section and summarising their conclusions. The report's recommendations are in the following areas:

- Inclusion of an increased stewardship ethos in communication
- Participatory activities and communication collaborations to enhance
 - adaptive wildlife management, in line with international best practice
 - development of communication well-suited to audience
 - increased communication activities and events through community and commercial partnerships
- Infrastructure and resourcing, including large scale interpretation audits
- Communication enhancement, including proactive communication and good news stories on the part of park management
- Research activities and data collection, including
 - media analysis to inform communication strategy
 - increased detail, quality, quantity and dissemination of dingo research on the part of management agencies.

2. Introduction

2.1 Project aims

The research problem: contextualising contentious dingo management

Dingoes are one of the most contested wildlife management issues in the Australian context. Dingoes arrived in Australia thousands of years ago, and now occupy diverse landscapes with territories spanning urban, rural and remote regions. These territories range across both conservation (public good) and privately owned (private good) properties. On K'gari-Fraser Island dingoes are iconic. They have earned their iconic status through their role within the Island ecology as an apex predator and through deep-time associations with Indigenous Australian communities (Daniels & Corbett 2003; Smith & Litchfield 2009). Dingoes occupy a significant place in the cultural value of the Island for its many visitors, perceived as symbols of wild Australia (Hyttén 2007). This is a value exploited by the local

tourist industry. It is also a value problematised by semantic constructions and presumptions. Specifically, there are presumptions about what determines 'naturalness' or 'the wild' versus 'the domestic' (Trigger *et al.* 2008; Healy 2007).

The dingo is paradoxically valued through wildness *and* through human interaction, raising many issues in the management of dingoes on K'gari-Fraser Island. The conservation sector (both scientists and advocates) perceive the dingo to be important to ecological functionality more generally in Australian contexts (Johnson & Wallach 2016). This role is protected through conservation legislation, particularly in the conservation context of K'gari-Fraser Island. However, this role is contested by other sectors such as the pastoral industry, who view dingoes as a pest to livestock production. This perception is supported through Australian government policy promoting active eradication (Healy 2007). These positions are defended by sectors of the scientific community who perceive the dingo as a potentially destructive species, representing it as introduced (albeit not recently), akin to the fox (Allen *et al.* 2013) which was more recently introduced through European colonisation. Solutions to the impact of dingoes on private sector interests include marketing them to Southeast Asia as a potential commercial food product (Allen 2016). The diversity of responses to the 'dingo question' demonstrates a contested domain – a disputed subject, deeply grounded in the cultural origins of values defining the issues. This tension limits potential options for managing dingo-human interactions (Archer-Lean *et al.* 2015).

The dingo has simultaneously interacted with Aboriginal peoples and persisted through autonomous 'wild' behaviours for thousands of years: it thus disrupts predominant settler constructs of an authentic, wild dog that is part of a natural environment (Hyttén & Burns 2007; Carter *et al.* 2017). It refuses to fit within simple definitions of Australian 'wildlife', used to maximum advantage in tourist-oriented communications and other national storytelling.

For many K'gari-Fraser Island stakeholders (some visitors, residents, and members of local community groups) there is a perception that, like the domestic dog, the dingo has a relational interdependence with human beings, representing intimate value. For example, there is an historical community practice of residents feeding the dingo (Burns 2006) possibly substituting for domestic dogs, which are excluded in this World Heritage site (Archer-Lean *et al.* 2015). There is some evidence to suggest this practice has residual value and continues despite changes in vesting of the Island to World Heritage (Fraser Island Residents Association representative, personal communication 2016, 24 September)³. Local community mobilisation supporting feeding stations, anti-tagging, anti-culling and

³ In accordance with the ethical guidelines by which the project abides, individual communications have been de-identified. Transcripts of focus groups and survey responses are available upon request.

unwillingness to report dingo behaviour that is defined by QPWS as problematic indicates a dingo conservation message that is at odds with QPWS's Fraser Island Dingo Management Strategy. QPWS visitor communication focuses on discouraging dingo feeding, indicating a response to pervasive local and visitor expectations of forms of intimate human-dingo interactions.

In the literature, there are long established debates over responses to dingo-human incidents that can be summarised as giving primacy to human-safety (Beckman 2010) rather than being animal focused (Healey 2007; Hytten & Burns 2007). That these debates situate the dingo as contested is evidenced by the vexed media representation of QPWS management and the ongoing regrettable nature of human-dingo incidents (Grewal 2015; Perets 2016). The disputed nature of these interactions positioning the dingo as visible and interacting with humans, yet wild and therefore dangerous to humans, is framed by a system of values that socially defines, and commercially markets the K'gari-Fraser Island dingo. The debates framed by an already nationally contested species (Archer-Lean *et al.* 2015) find some of their most virulent and extreme positions expressed in the K'gari-Fraser Island context. This highly politicised policy arena must be navigated by QPWS to present an effective communication of their *dingo-safe* message and to implement the Fraser Island Dingo Management Strategy.

This research draws on analysis of literature, communications strategies, surveys, interviews and focus group workshops to offer insights into the complexities and problems of dangerous animal management and links with the nature of communication within a World Heritage context. The research provides contextual and evidence-based results recommending a shift in perspective for the implementation of future communication.

2.2 Background to the research

K'gari-Fraser Island communication and dingo management: the story so far

This research sought to establish the distinction between dingo management strategies and communication of dingo management strategies in QPWS external documentation, including brochures, signage and educational collateral. Communication in the context of wildlife management is key to influencing human attitudes and behaviour. The necessity of focusing on human change and communication as crucial to management practice is long established in the literature (Baruch-Mordo *et al.* 2009). This involves expanding from a management practice focused on science and animals, to including social science tools to position people and their behaviour as the focus. Research explicitly focused on communication in the wildlife management arena is sparse (Triezenberg, Riley & Gore 2016; Gore & Knuth 2006; Muter *et al.* 2013; Weiler & Walker 2014). However, focused communication campaigns are noted as an effective alternative way forward in the literature (Atkin & Rice 2012; Ernoul & Wardell-Johnson 2016). There is more information on the potential nature and costs associated with communication campaigns, along with research on the potential for best practice interpretation, in the recommendations section of this report.

An independent research group, Environmetrics, in consultation with Griffith University, conducted the last detailed review of the communication of dingo management strategies (Environmetrics 2009). This consultancy evaluated key communication messages and identified audiences and education programs used in relation to dingo management on K'gari-Fraser Island. It assessed the 2004 Communication Plan as providing firm guidance for communication activities up to 2009. It recommended that communication activities should incorporate 'a "Hierarchy of Outcomes" framework to relate goals, objectives and actions to performance measures...[and] take a proactive and holistic view...[in promoting FIDMS] in multiple forums in the face of vocal sceptics' (Environmetrics 2009, 18). A Hierarchy of Outcomes framework (also referred to as the 'Hierarchy of Effects Model' - see Sheehan & Xavier 2014) is also used in the planning, implementation and evaluation of social, political and change campaigns. Subsequently, many of Environmetrics' recommendations, such as use of social media and deployment of dedicated rangers in the area of visitor management and interpretation, have been initiated. However, it is not clear how far multiple forums have been exploited, nor to what extent a specific Hierarchy of Effects approach has been deployed. There has been no communication document formally reviewed and adopted by the Department since this review, although a draft document developed by a QPWS Interpretation Officer was completed in December 2013.

A direct outcome of the 2009 Communication Review and part of a developing sophistication of communication approaches in K'gari-Fraser Island dingo management was

Elizabeth Beckmann's *Literature Review on Communicating about Dangerous Wildlife* compiled for QPWS and the then Department of Environment and Resource Management (DERM) in January 2010. This annotated bibliography focused on locating points where published literature was inconsistent with QPWS communication or experience at that time. The report stresses a lack of international research into *dingo-safe* strategies as applied on K'gari-Fraser Island. Beckmann (2010) asserts communication theory was not used in international management strategies, suggesting a need for QPWS to engage with social marketing principles for the theoretical and practical implementation and development of *dingo-safe* strategies. Finally, the annotated bibliography advised that online tools could be more fruitfully used to gather data about visitors and to communicate with them.

The literature review within this report moves such crucial annotative bibliographic work into a broader narrative. The research here is premised on the idea that management strategy, communication forms and stakeholder perceptions are all integrated and must be assessed in relation to one another. In terms of constructing a narrative applying existing literature, this report draws out points of difference and innovation in the international context. One potential limitation of the Beckmann report is that it defines QPWS strategies as best practice rather than constructively exploring future communication innovation that might be drawn from a broader literature. This is not to say that QPWS is not following international best practice in dangerous animal management: the discouraging and penalising of feeding of and proximity to dangerous animals; use of fencing; rubbish containment; and closing park areas around breeding cycles; are all entirely consistent with international best practice. Additionally, Beckmann's point that the K'gari-Fraser Island dingo management strategy is not visible in international research can still be made. However, it is not up to the international community to research this area. As this report will demonstrate, QPWS has an opportunity be research leaders, and the publication of their own research is important. The focus in this report is to ascertain how the FIDMS and related communication reflect international best practice and establish what QPWS can learn from the international approaches in terms of communication strategies.

Communication and planning advice in relation to public behaviour regarding dingoes is ongoing in various forms at QPWS. In 2012, the research group Ecosure, under the auspices of the then Department of Environment and Heritage Protection, conducted a detailed review of the dingo management strategy itself. This review, along with a review report from a steering committee comprised of representatives of Fraser Island Natural Integrity Alliance and the scientific community (Possingham, Phillips, Sargent & Johnson 2013), resulted in the current Fraser Island Dingo Management Strategy (2013). The updated 2013 FIDMS contains a section on the communication and education program (section 2.5.2). The 2014 *Fraser Island Dingo Conservation and Risk Management Strategy Implementation plan* provides further detail. Section 5.2 covers the communication and education program including public contact by rangers, education material, compliance, partnerships, new

opportunities and evaluation. Section 5.3.5 of the report recommends publication of research initiatives, which is pertinent to communication strategies.

Beckmann's 2010 literature review makes reference to the Theory of Planned Behaviour and the Elaboration Likelihood Model as crucial to the development of 'Fraser Island Dingo communication' (Beckmann 2010: 22). These theories are not in evidence in the existing FIDMS implementation documents. While theories may not always be visible in practice, the question is: how far has QPWS considered these theoretical suggestions in their communication programs and activities? The Elaboration Likelihood Model refers to the process of message selection, distinguishing between the central and the peripheral routes in communication. The 'central route' is used by people who are interested in the message and therefore likely to attend to it. However, many times people are too busy to pay attention. They may be especially distracted when on holiday, considering more immediate concerns such as tides, safe sand and bush track driving. Understanding this, the Elaboration Likelihood Model suggests the use of a peripheral route using other channels such as celebrity endorsement, and interpersonal visits (see Sheehan & Xavier 2014) to build trust and familiarity with messaging. Generally, the central route offered by QPWS depends on the official sites and brochure publications with little evidence that peripheral routes have been considered.

The QPWS' draft 2013 document on communications covers more detail in terms of responsibilities. It would be useful for QPWS to fully assess the current funding and practical implementation of many of the elements discussed in this draft document. There is need for fuller development of the communication sections of the 2014 FIDMS implementation document and finalisation of the draft communication and education implementation document.

The following list outlines important activities that do not appear to be consistently applied or financially supported in the 2016 context:

- Strong communication and partnership activity with *Fraser Coast Opportunities*, the peak body for regional engagement and tourism development in the region
- Regular sign audits
- Regular visitation surveys
- Regular extension programs run by QPWS for all commercial tourism operators
- Campground ranger information / host programs, covering camper briefings
- Development of new technologies beyond the broader QPWS Facebook page (into phone apps for example)
- Regular consultation with the dingo working group.

These elements can be considered peripheral routes according to the Elaboration Likelihood Model. Further the Hierarchy of Effects Model suggests the need for formative, summative

and ongoing evaluation of communication tactics and message effectiveness.

QPWS have on file an implementation schedule of activities related to communication and community engagement (*Fraser Island Dingo Communication and Community Engagement 2010-2015*). This document was last updated in 2012. It provides intended and completed activities in terms of:

- Management issues to be addressed, including quick response to incidents and quick response leaflets on aggressive dingoes and other factors and debunking myths
- Sign renewal planning
- Community engagement through social marketing, community engagement rangers, and seasonal education campaigns, such as in spring, or Christmas/New Year (this has been occurring since 2010)
- Visitor surveys, with next one planned for 2014-2015 (this does not appear to have occurred)
- Social media functionality that includes planning for response to other media and QPWS' authoritative use of this media (this seems to have been stalled by government protocols)
- Development of a QPWS website with a specific dingo page (this has been actioned)
- QPWS presented as authoritative dingo managers via publications and news stories (there is some internal publication of this nature on the website, in Facebook and in information brochures, but not external scientific publication)
- Use of the Fraser Island Visitor Guide and accompanying dingo brochure (still used)
- Enhancing the face to face ranger program (this is continued on and off, but there have been considerable gaps).

Overall this implementation schedule demonstrates the complex communication issues facing the K'gari-Fraser Island context and intention to act on Beckmann's 2010 recommendations. It is dominated by an ethos of one-directional communication rather than collaboration with stakeholders, and it seems that resourcing has, thus far, limited its full implementation.

Finally, while not a communication document, QPWS commissioned a study into the method of mark recapture using GPS to locate the home ranges and activities of dingoes in 2013 (Baxter & Davies 2013). The findings of this report indicate information that is not fully communicated in the media options exploited by QPWS. The results (Baxter & Davies 2013) present a form of good news story that may be promoted as part of management of QPWS public relations, particularly results that show sightings are not a good indicator of population due to:

- Diversity in home ranges sizes and their seasonal nature
- Evidence that dingoes may be beach dwellers or inland dwellers, coast to coast dwellers or a mix of all three.

The importance of promotion and extension of management agencies' research is borne out by this body of research. Much of the core research is already published and available for implementation. For example, a comprehensive report into the monitoring and management of the wealth of values associated with and impacted by World Heritage listing on K'gari-Fraser Island has been completed (Wardell-Johnson 2015). This provides an important foundation for ongoing adaptive management practices to address World Heritage priorities. This research report, *The Iconic Dingoes of K'gari-Fraser Island: communicating for their future* extends the existing research with specific attention to communication strategies, addressing the vexed and contested topic of dingo-human interactions.

2.3 Research and reporting scope

This research was commissioned by the Department of Science, Information Technology, Innovation and the Arts' 2014 Fraser Island Dingo Research Program. It sets out to evaluate the Queensland Parks and Wildlife Service's (QPWS) communication of the Fraser Island Dingo Management Strategy (FIDMS, 2012) and *dingo-safe* message and the various human values that represent the K'gari-Fraser Island dingo.

The research scope included a literature review of peer-reviewed journal articles, wildlife management reports and webpages of similar World Heritage listed parks and wildlife management agencies internationally. The field research drew on a range of instruments to identify visitor and stakeholder responses to the QPWS *dingo-safe* message. These included evaluation of communications, focus workshops and interviews, and survey research.

2.4 Project objectives

The research report aims to:

1. Contextualise communication and management practice on K'gari-Fraser Island through appropriate international comparisons using literature review
2. Identify and synthesise stakeholder positions and responses in the community to dingo-related communications
3. Identify the ways in which different sectors and stakeholders value the dingo and the impact of these values on responses to communication about dingo management
4. Evaluate relationships between the source of communication and influences on interactions between human beings and dingoes, and related knowledge about dingoes on K'gari-Fraser Island
5. Provide advice recommending integrated communication planning for managing human-dingo interactions that acknowledges and implements World Heritage values

for future QPWS actions.⁴

Originally this research intended to map the relationships between places of interaction with people and dingoes, and kinds of interaction, but the data available and project team changes prevented this.

This report synthesises specific stakeholder positions and responses to communication messages, and provides a brief assessment of communication forms currently in operation presenting a framework for future communication planning.

2.5 Research approach and methods

This research drew on trans-disciplinary approaches to offer insights from theory to inform the best possible application in practice. While the core expertise is drawn from four distinct disciplines, the exchange and collaboration integrates a range of methods and analyses to make the best of theory and experience in practice (Wardell-Johnson *et al.* 2015). Thus, transdisciplinary approaches show that questions that are important in practice are applied as questions for scientific and theoretical exploration. This ensures that the results in this research draw on the scientific method and disciplinary theory to properly address the needs of practice showing the interaction of the dingo as ‘co-generator’ of the landscape it inhabits (Archer-Lean *et al.* 2015).

The research includes a literature review, field research and evaluation of communications. The research was conducted using a triangulated approach to best interpret the complexities of the K’gari-Fraser Island situation in terms of human dimensions of dangerous animal management. The research involved:

1. Trans-disciplinary research drawing on expertise from critical human / animal studies, environmental sociology, human and animal geographies, media analysis, and human dimensions of wildlife management
2. Theoretical framing drawn from these disciplines to illuminate in nuanced ways the complexities of human engagement with the natural environment inherent to the research problem
3. Primary and secondary data gathering activities conducted in a mixed methodological approach combining qualitative and quantitative methods for a comprehensive analysis.

The quantitative methods (summary statistics, numerical taxonomy, and pattern detecting algorithms) ensured that the statistical components addressed extrapolation criteria. The

⁴ QPWS has not had a finalised communication plan since 2004 so current policy and procedural documentation is timely.

integration of qualitative methods (semantic mapping, narrative analysis and thematic qualitative analysis) provided a nuanced approach that exposed the detail.

2.5.1 The literature review methods

To provide an effective framework for the analysis of field research outcomes, this report established a research context for analysis through literature review. A critical literature review was used to summarise and synthesise the research around the management of dangerous animals in large national parks internationally. It provides context to the current research into K’gari-Fraser Island dingo management and communication against up to date international research into communication and education of the public in relation to dangerous animals. It also provides a framework for understanding recent research on the significance of adaptive and consultative processes in the human dimensions of wildlife management.

The literature review comprises peer-reviewed journal articles, wildlife management reports and relevant websites, particularly webpages of similarly World Heritage listed parks, conservation areas and wildlife management agencies internationally. Core management strategies (particularly engineering strategies, such as fencing) used internationally are identified through the southern African example. Finally innovations, successes and issues in the international context (in North America and beyond) were reviewed.

This review of communication, interpretation and narrative used internationally to limit dangerous human-animal conflict provides a useful point to reconsider opportunities for innovative communication in the K’gari-Fraser Island context. This form of comparative analysis provides an instructive foundation to future communication planning.

2.5.2 The field research methods

The field research sought to address visitor and stakeholder responses to the QPWS *dingo-safe* message. The strategies to address this included: (1) evaluation of communication media through qualitative narrative analysis; (2) stakeholder consultation through focus group workshops and individual interviews; (3) sources and value of communication used by visitors, and identification of pre-existing socio-cultural values of relevance to interactions with dingoes through survey research. This report synthesises specific stakeholder positions and responses to communication messages, and provides a brief assessment of communication forms currently in operation.

Primary research was multi-method applying a range of strategies that included the following:

- Focus group workshops moderated by one or more of the research team with:
 - QPWS ranger workshop on K’gari-Fraser Island (22.9.2015)
 - Butchulla traditional owners workshop in Hervey Bay (1.2.2016)

- Fraser Island Natural Integrity Alliance (FINIA) representative interview via phone (9.5.2016), augmented with written submissions to focus group questions supplied at FINIA
- Written submission in response to forum questions from Save the Fraser Island Dingo Organisation (SFIDO) (16.3.2016) via email.
- Individual interviews with nominated representative members of key stakeholder groups including:
 - Fraser Island Residents Association (in person on K’gari-Fraser Island)
 - Butchulla traditional owners (in person in Hervey Bay and via email)
 - Four scientific experts representing a range of positions in dingo research (conducted via telephone)
 - Tourism operators – both small private operators and large corporate operators such as Kingfisher Bay Resort Inc. – including rangers (conducted in person and via telephone by members of the research team in Hervey Bay, Rainbow Beach, and on K’gari-Fraser Island)
 - QPWS communications staff (conducted in person).
- A survey of a random sample of 158 K’gari-Fraser Island visitors and other stakeholders between August 2015 and April 2016. Responses were collected online, on transport to the Island, at selected high-use visitor sites, at less frequently visited sites on the eastern beaches, in the central forests, and at cabin and camp sites on the Island.

The survey, focus group and interview questions were developed in concert with QPWS rangers’ feedback, the Fraser Island Sustainable Visitor Capacity Study (2008) and the Ecosure (2012) survey questionnaire. The data gathering strategy and questions were approved by the University of the Sunshine Coast’s human research ethics process, and written permission to participate was gathered from all participants including assurances that all recorded information would be de-identified. QPWS permits to gather the data were approved. The survey and focus group questions are attached in appendices one and two.

Gathering survey data involved strategic selection of sites to ensure a diverse range of visitor and local community profiles. The survey was primarily completed by visitors approached in person at campsites, key tourist locations (Central Station, Dilli Village, Lake McKenzie, Eli Creek, Eurong shops, and Cathedral Beach) and key entry and exit points such as on the River Heads barge, and Rainbow Beach barge and permit office between September 2015 and mid-February 2016. Some specialised stakeholder respondents (for example FINIA members and tourism operators) also completed surveys online through a Survey Monkey version. These site determinations ensured a balance of family campers, fisher people, high-end tourists, tag-along tours members, backpackers and individual day-trippers, as well as coastal (east and west) and inland visitors, residents and tourism employees to ensure a cross section of participants.

2.5.3 The communications analysis methods and data

As part of this research project, a *dingo-safe* backpacker event was manufactured and staged by public relations students enrolled in the course CMN243 at University of the Sunshine Coast in October 2015. This experimental event served as a template for the ways in which events and community collaboration may effectively be harnessed.

A sample of communication media was determined by the most freely available, most relevant, and most used communication media as revealed in the survey data. There are two main forms of QPWS online presence: the Queensland Government's Department of National Parks, Sport and Racing's Fraser Island Great Sandy National Park's page titled 'About Fraser Island Dingoes', and the Queensland National Parks' Facebook page. The key brochures deployed by QPWS are the *dingo-safe* brochure, the 'discovery brochure', and the 'dingoes of Fraser Island (K'gari) brochure' – all freely available at the entry points of River Heads and Inskip Point barge ticket purchase venues. Signage samples and human-dingo incident data were provided by QPWS. Thematic analysis of these samples of QPWS communication include:

- website and Facebook activity
- written brochure material targeted for the public
- samples of photographs and signage
- human-dingo incident data.

Strategic media communication provides QPWS with the means of defining the content of information provided on dingoes and the K'gari-Fraser Island context. QPWS communication output in its various forms, from images to words represented online and offline via multiple media platforms, was analysed using qualitative and quantitative textual analysis methods including critical discourse analysis and framing analysis.

Textual analysis is a methodology used in media studies to analyse media texts and output. It identifies specific characteristics of messages, words chosen, sentence structures, images and their placement. This type of 'deep dive' on the meanings of words and their connotations allows for understanding of subtext and some potential interpretations and emotional responses to a message.

Content analysis is a method that identifies the latent or manifest content of media. Textual data provide an insight into the constructed aspects present in texts, and their main themes and issues (Hansen & Machin 2013; Weerakoddy 2015). Thus, social media sites were manually analysed using qualitative content analysis methods to identify themes and patterns drawn from literature review insights on environmental education and interpretation. Images on the website were critically analysed to interpret aspects of

ordering and organisation of messages, and to contextualise the representation in relation to organisational values, stakeholder interest and activists' claims.

2.5.4 Interview and focus group data analysis

The methodology of semantic mapping was applied to draw out central messages and themes within the focus groups held with stakeholders, and in the interview material in this research. Semantic mapping was used to analyse the qualitative data gathered from notes and transcripts. Semantic mapping was based on the automated content analysis functions of the analysis package Leximancer (Smith 2003; Smith 2005), which applies clustering algorithms to analyse the frequency of words and phrases and their comparison with similar words and phrases. Clusters grouped to generate overarching themes or thematic clusters are independent of prior assumptions of the researcher. The connectivity ranking evaluates the degree to which each concept and theme or thematic cluster contributes to the overall semantic map. This process allowed for diverse positions to be captured through qualitative and quantitative methods. Ernoul and Wardell-Johnson (2016) detail the use of Leximancer and its benefits as follows:

Leximancer is a specialist content analysis package which extends manual coding procedures through the application of algorithms, machine-learning and statistical processes (Smith & Humphreys 2006). This provides a means to discover ontology and representational structure in text through an unsupervised process that uncovers core associations within a body of text. The process reduces expectation biases that often result from manual coded analyses (Dann 2010) with extensive use and testing across a range of research domains (for further details of the Leximancer process, Grech *et al.* (2002) and Smith and Humphreys (2006) provide details on method and statistical structure, as well as tests for the accuracy of the results).

There are many benefits to this methodology including the speed with which it identifies themes and related concepts within large tracts of text. It achieves this through a machine-based lexicographic tool providing a framework for interpretive and representational analysis (Young & Denize 2008). The outcomes are a conceptual mapping of text through the abstraction of families of words to identify concepts, and the relationships between concepts, to identify themes (Smith 2003).

This method was used to identify key positions showing the way these groups of people value and perceive the dingo, the FIDMS and the current communication process in three different definitions of community.

This research integrated data and synthesised results from a range of analyses to identify values and responses to communications about interactions between people and dingoes on K'gari-Fraser Island.

3. The international literature on human-wildlife interaction management in protected areas

There are many conservation settings that have addressed the management of human-wildlife interactions. These range from developed world to developing world contexts with high numbers of visitors to low numbers of visitors, and including people who live in protected areas, and protected areas that do not have people living in them. This literature review drew on research and reporting from three key international contexts: Southern Africa (elephants and large predators), North America (bears, wolves and smaller predators) and India (tigers). This section does not discuss in detail the literature on dingo management on K'gari-Fraser Island as this is well established in work done for QPWS (Beckman, 2009). The literature comprised peer-reviewed journal articles, wildlife management reports and websites that provided information on core management strategies such as engineering solutions and animal-focused management practice (such as fencing) and issues, successes and innovations in these international contexts. The learnings for QPWS are outlined in the recommendations section of this report and are characterised overall by a focus on human dimensions of wildlife management and reducing animal intervention.

3.1 Understanding wildlife management strategies: Kruger National Park as illustrative case

This section of the literature review explores best practice in dangerous animal management through broader African and Indian contexts. The focus is on practical and physical (often termed engineering and animal focused) management practices. It then turns to Kruger National Park (KNP) as a case study in innovations in the management of dangerous animals.

3.1.1 Fencing

Fencing is the main method used in management of wildlife, particularly Damage-Causing-Animals (DCAs) in conservation areas. If well-designed, constructed and maintained, the research literature seems to concur fencing is the most effective strategy in mitigating risk of damage or wildlife-human conflict (Lamarque *et al.* 2009; Freitag-Ronaldson *et al.* 2008; Hoare 2012; Marker & Boast 2015; and Okello *et al.* 2014). Farm invasion and crop damage are seen as the biggest threats for communities with elephants. However, a review of the fencing strategy for elephants found that it is only effective if it is circular and surrounds small targeted areas in need of protection, such as crops and grain stores (Hoare 2012). Localised fencing as a strategy is also recommended for altering access to key resources (Ferreira *et al.* 2012) and protection of livestock from other DCAs (Marker & Boast 2015).

However, fencing is not always effective. Elephants can circumnavigate fences and can get funnelled into areas that exacerbate conflict (Smith & Kasiki 1999 in Hoare 2012). Similarly, anecdotal reports from stakeholders suggest dingo fencing on Fraser Island is not always dingo-proof. For example, people leave gates open, some dingoes can navigate cattle / dingo grids, and gaps in fencing in need of repair have resulted in dingoes entering fenced

areas. Fencing around targeted areas is more effective against elephants, because 'it is virtually impossible to confine elephants to a protected or designated area by means of fencing' (Hoare 2012: 65).

Fencing construction approaches need to be suited to individual situations (Hayward & Kerley 2009). Hoare (2012) identified that lack of maintenance and vandalism of fencing made large scale fencing ineffective in combatting damage caused by elephants. For fencing to be effective it needs to be well-maintained and that incurs financial costs and demands resources (Hoare 2012; Hayward & Kerley 2009). Fencing for conservation is meant to minimise threats to biodiversity and people. It can be costly not only in economic and resource terms, but fencing can also be a threat to biodiversity in the long term through exclusion of some species and reinvasion of others (Hayward & Kerley 2009). Fencing small targeted areas (for example, to temporarily keep people, livestock and food sources protected within fences) and leaving species to exist in their natural environment reduces the threats to biodiversity that fencing larger areas can incur.

This strategy of fencing has had some short-term success on K'gari-Fraser Island in keeping dingoes out of high-use visitor areas, such as camping grounds, thereby reducing serious human-animal conflict incidents (Ecosure 2012). There has been some past community group concern that fences may reduce dingo diet diversity and opportunity (Parkhurst 2012). It is difficult to assess the impact of fencing in the K'gari-Fraser Island context, as it seems there is no clear data recorded in terms of the exact dates and locations of fencing and whether human-dingo incidents have reduced, or dingo health been compromised, as a result of fencing. Nevertheless, there is anecdotal evidence provided by various stakeholders that the fences have reduced human-dingo interactions. However, this also means a reduction in all forms of human-dingo interactions indicating reduction in sightings generally.

It is clear that K'gari-Fraser Island QPWS fencing initiatives in recent years are consistent with international best practice. Current K'gari-Fraser Island management strategies are an opportunity for generation of transparent data to evaluate the effectiveness of fencing to reduce human-dingo incidents. QPWS may consider targeted publishing and reporting of these results to show the relationship between fencing and reduced dangerous animal habituation as one step towards evaluating current management strategies. Transparent communication of messages related to human-dingo incidents and diet as a consequence of fencing would effectively evaluate QPWS strategies and promote the effectiveness of their *dingo-safe* message.

3.1.2 Deterrents

In the international context, preventative strategies are used on their own and in conjunction with fences to deter DCA such as elephants. For example, chili-based olfactory deterrents and beehives incorporated into fences were found to be somewhat effective in targeted areas but questionable for general crop protection against elephants (Hoare 2012; SANParks representative, personal communication 2016, 7 May). A form of capsicum spray was successfully tested to repel raiding elephants in Zimbabwe but was not cost effective (Osborne & Parker 2003). Other deterrents used in Africa include forms of hazing: scaring

wildlife off with loud sounds, for example beating drums, tins in trees, shouting, and explosive devices; or using visual deterrents such as scarecrows (Lamarque *et al.* 2009). These deterrents are only effective in the short-term, however, as animals usually learn to ignore them (Lamarque *et al.* 2009). Hazing can also be detrimental to the welfare of animals and have negative behavioural outcomes. The review of the Fraser Island Dingo Management Strategy post-2006 by Ecosure and the Review Steering Committee recommended that the practice of hazing be stopped due to the 'potential negative effects on the welfare and behaviour of dingoes' (Queensland State Government 2013: 5). Consistent with best practice, this recommendation was immediately adopted by QPWS and the practice of hazing as a dingo deterrent was officially suspended.

3.1.3 Removal or relocation

Removing problem animals is a strategy used throughout the world in addressing human-wildlife conflict, including in conservation areas such as national parks. Over the years Kruger National Park has applied the strategy of translocation or occasional culling of elephants to maintain sustainable ecological capacity (Ferreira *et al.* 2012). It is important to note that the reason for removal has not just been population control. Removal through translocation can be a preventative strategy in minimising damage, but is also problematic. Challenges include: identifying the correct problem animals, inadvertently harming animals in the process, and potentially introducing disease or conflict in another population. In addition, translocation requires large areas of habitat to be available, and the problem animals frequently return (Lamarque *et al.* 2009). Further, Hoare (2012) suggests there are usually other individuals ready to take the place of a translocated problem elephant crop raider. Finally, there are the social implications to group dynamics and the implicit emotional harm and trauma to the animal in translocating it away from its herd / pack / family group (Lamarque *et al.* 2009; Hoare 2012; Funston & Levendal 2014). There is a growing acknowledgement in scientific circles of the need for compassion in interaction with predatory animals (Wallach *et al.* 2015). Ethical and critical human animal studies analyses have long argued the intrinsic right for wild animals to exist free from human intervention (See Calarco 2015 among many).

Preventative measures for tiger-human conflict in India also include separating people and domestic animals from tigers through relocation and zoning (Goodrich 2010: 302; National Tiger Conservation Authority 2015). Relocation of residents from a wildlife habitat area can be successful if voluntary and beneficial for residents, however it is expensive (Lamarque *et al.* 2009; National Tiger Conservation Authority 2015). This is clearly not an option in the current context of K'gari-Fraser Island given its primary geographic identity determined by mass tourist visitation. As with other dangerous animals, preventative measures for tigers include: improving livestock management, such as using small fenced enclosures for livestock at night and guarding livestock during the day; increasing wild prey, habitat protection and restoration; and minimising harm to tigers caused by humans, thereby reducing aggressive behaviour of injured tigers (Goodrich 2010).

Mitigating measures to reduce retaliation killings (revenge for killing of farm stock, for example) include compensation and incentive programs to engender local acceptance of

predators, such as tigers (Goodrich 2010). However, compensation of livestock kills is rarely successful. For example, compensation is costly, slow to administer and unsustainable; verifying claims is difficult and leads to false claims and corruption, and compensation may not be viewed as fair or equitable across the community (Hoare 2012; Goodrich 2010; Lamarque *et al.* 2009).

3.1.4 Destruction of the animals

Destruction of animals is a strategy legally used in conservation areas, such as Kruger National Park, to minimise damage related to the park's biodiversity and human-wildlife conflict. Farmers may seek a permit to kill animals in order to protect crops and lives, and hunters with a permit may kill animals for money or hedonistic pleasure. There are numerous animals killed illegally by poachers for financial benefit. Hunting is used legally in destruction of problem DCAs applying an economic approach that can also be of benefit to local communities (Lamarque *et al.* 2009). Benefit could ideally derive from income for local people involved in managing the hunting, and earning money towards funding conservation and protecting or compensating the community, which is in current practice in Namibia's Kunene and Caprivi regions. However, it is difficult to ensure the actual problem animal is targeted and often a rapid response is needed, particularly if the animal may be wounded and become dangerous. Lamarque *et al.* (2009) indicate that to be legitimate hunting needs:

to be based on scientific monitoring to ensure sustainable harvests, and needs to be controlled by policies and regulations which address the timing, location and methods of hunting, as well as the distribution of benefits, including meat, to all stakeholders (Lamarque *et al.* 2009: 67).

Research by Anthony, Scott and Antypas (2010) demonstrates how the practice can be, and was, widely abused in Limpopo Province leading to a moratorium on such hunting practices.

As with most DCAs common reactive measures taken in response to incidents of human-wildlife conflict are lethal control and removal of 'problem' animals (Karanth & Gopal 2005; Miquelle *et al.* 2005; Treves & Naughton-Treves 2005; Gurung *et al.* 2008; Nugraha & Sugardjito 2009; Boomgaard 2010; Kawanishi *et al.* 2010; and Nyhus *et al.* 2010; in Goodrich 2010). While this is necessary in many situations, in the case of tigers there are also problems with these approaches, such as removing or destroying the wrong animal and reduction of wild populations of tigers (Goodrich 2010: 305). As a management strategy, the practice of killing problem animals is increasingly controversial because it can be cruel and has a limited effect on controlling human-wildlife conflict. Reduction of some wildlife can have a negative ecological impact and problems often return (Lamarque *et al.* 2009). The use of lethal management strategies is probably the most contested element of the FIDMS and the most difficult to manage in terms of communication strategies.

3.1.5 Limiting number of visitors

An issue for the management of K'gari-Fraser Island is visitor numbers and the impact overcrowding has on the environment and on the dingo population (Wardell-Johnson *et al.* 2015). Kruger National Park likewise has problems with excessive visitor numbers, particularly in the south section where the park has reached social carrying capacity (that is,

the maximum number of visitors the park can host without impacting negatively on the environment and thus deterring other visitors) (Ferreira & Harmse 2014). Ferreira and Harmse (2014: 9) outline the measures that KNP has already implemented to control visitor numbers:

- limiting the size of the rest camps, requiring advance reservations for overnight spaces
- capping the numbers of overnight and day visitors
- establishing a restrictive vehicle to road ratio
- implementing a zoning system for infrastructure development
- developing picnic facilities for day visitors away from the rest camps.

However, these measures have proven largely unsuccessful in the busiest area of the park – Marula-South. Ferreira and Harmse (2014) suggest that, in this case, South African National Parks (SANParks) are prioritising financial benefits over biodiversity and a quality ‘wildlife experience’ (Ferreira & Harmse 2014: 16).

3.1.6 The Kruger National Park and SANParks story

Kruger National Park (KNP) is promoted as South African National Parks’ (SANParks) premier park. It was established in 1898 and comprises almost 2 million hectares of land (SANParks 2016). The focus and mission of the park has evolved over the years from ecotourism through ‘assertive hands-on management and research’ to a more hands-off adaptive management approach, developed in the 1990s, that now encourages more open involvement and knowledge sharing through research, monitoring and cooperation (Freitag-Ronaldson *et al.* 2008). This version of adaptive management was adopted by SANParks and termed ‘strategic adaptive management’ (SAM). The park’s mission (desired state) derives from a participatory, public consultation process which prioritises the value of biodiversity, human benefit, wilderness, cultural heritage and constituency building (Freitag-Ronaldson *et al.* 2008). However, Anthony, Scott and Antypas (2010: 226) indicate that the journey from the old form of governance to the relatively recent approach of adaptive, collaborative, multi-level management employed by KNP has not been a continuous, ‘uniformly effective’ process.

KNP’s 2008 management plan refers to the Park’s ‘damage-causing animals’ (DCA) as primarily lions, buffalo and elephants (Freitag-Ronaldson *et al.* 2008). The plan mentions these animals in the context of threatening community livelihoods in terms of livestock, crops and property. This focus is evidently different from the FIDMS’ focus on keeping park visitors safe and conservation of the animals. However, the plan admits that ‘from time to time’ problem animals have a negative impact on ‘visitor experience, staff safety and management infrastructure’ (Freitag-Ronaldson *et al.* 2008: 88). KNP’s DCA management program centres on incidents of human-animal conflict along the borders of the park and argues that while the park is responsible for its fences it is not responsible for the DCAs outside the park. This is a sentiment echoed by Yellowstone National Park. Anthony, Scott and Antypas (2010: 226) identify this as a policy and governance issue that results in: ‘a misfit between new institutions and old ones, where responsibility has been diffused,

capacities neglected, and in which learning has been slow to occur'. Unresolved conflicts can have a detrimental effect on the park in the long term, in terms of community relationships, financial resources, human resources and biodiversity, and likewise on the community in terms of human life, livelihood, crop and property losses (Anthony, Scott & Antypas 2010). While there is evidence of tribulations in an adaptive and collaborative approach to wildlife management, it is an example of a best practice ideal in the international literature that could be the focus for communication strategies for QPWS in the future.

3.1.7 Elephants

The KNP has an elephant management plan that is more recent and detailed than the DCA program outlined in the Park's 2008 management plan. The Elephant Management Plan 2013-2022 details managing ecological effects of elephants in human-elephant conflicts (causing damage) and tourism and stakeholder interactions with elephants (Ferreira *et al.* 2012). Management includes several approaches to minimise damage including fencing, spatially and temporally altering access (e.g. to areas and sources of water), contraception, removal, destruction of animals and the use of deterrents to reduce densities. The Plan reports that, generally: 'water provisioning increased elephant survival, fences decreased elephant movement and culling lowered elephant densities that induced higher birth rates' (Ferreira *et al.* 2012: 42). To manage damage to biodiversity 500-800 elephants were culled each year in KNP up until 1994 when a moratorium on culling was imposed (African Wildlife Foundation 1999). Following the moratorium about 300 a year were removed from the park to maintain a sustainable population. An estimated 14,562 were killed in South Africa between 1967 and 1994 (Lamarque *et al.* 2009). In 2015, the number of elephants in the park was estimated at 17,000 (Lange 2015). This number is an increase from 12,467 in 2005, but SANparks chief executive David Mabunda (in Lamarque *et al.* 2009) suggests numbers would be upwards of 80,000 had the culling not occurred.

The Kruger National Park plan mentions using a contraceptive vaccine on female elephants in the late 90s. However, Lamarque *et al.* (2009: 61) argue that applying the vaccine has been 'largely unsuccessful' to date. It proved logistically difficult to administer and monitor, and produced aggressive behaviour in both females and males, who were chased by treated females. Lamarque *et al.* (2009) were not in the position to remark on the efficacy of other methods of contraception – chemical castration and vasectomy – but recommended they not be used in wildlife management, as the side effects are still unknown.

3.1.8 Lions

Lion numbers have declined across Africa in the last 30 years, but have increased in South Africa due to over 45 small reserves where lions have been re-introduced (Funston & Levendal 2014). Kruger National Park is one of the largest areas in South Africa where lions are protected and has an 'open system' of lion management, as opposed an intensive management system of lions in the isolated smaller reserves. KNP's Lion Management Plan comes under the recently devised Biodiversity Management Plan for the Lion (2014), which is a meta-population management plan for wild and managed wild lions in South Africa. Kruger lions are considered 'historic' in that, in general, they have not been 're-introduced'. Since the park was formed lion numbers have recovered to reflect historic populations and

are now considered stable at around 1700, so KNP is considered a 'lion stronghold' (Riggio *et al.* 2012 in Funston & Levendal 2014). However, some conservation activists, such as Dr Pieter Kat from UK charity LionAid, refute the claim that the population is stable, arguing that the 2014 Biodiversity Management Plan is based on flawed science and outdated data (in Cruise 2015). He contends that data on lion numbers in KNP, on which the Plan is based, are from 2005 and the lions have not been counted properly since. In KNP accurate data on populations is significant in informing management policy and ensuring transparent communication demanded by stakeholders.

Lion management issues revolve around keeping the populations sustainable. Small nature reserves in South Africa where lions have been re-introduced are challenged by high rates of population increase (Miller & Funston 2014). This has a detrimental impact on their genetic makeup, and creates problems around favoured methods for controlling numbers. Miller & Funston (2014), who studied lion populations and management systems in 14 reserves, argue current lion management approaches in these reserves need to be changed to slow the birth rate of lions, as the practices to reduce existing populations (such as culling) face ethical issues.

Strategies to maintain sustainable populations of lion in KNP include the legal commercial practice of trophy hunting⁵, although illegal hunting occurs in the border areas (Funston & Levendal 2014). Lions that venture outside the park and kill livestock are shot by rangers, rather than being translocated back into the park, as is the practice in Kgalagadi Transfrontier Park, which has a smaller population of lions. KNP uses approaches 'to mimic social and population dynamics' with strategic contraception practices for females, fallopian tube-tying and removal or re-introduction of males and females to mimic dispersal and death rates (Funston & Levendal 2014 : 40). In the smaller reserves, where overpopulation and inbreeding are an issue, lions considered as 'excess' are removed via translocation, hunting and, only in rare instances, culling.

The *Biodiversity Management Plan for the Lion (Panthera leo) in South Africa 2015-2019* (Funston & Levendal 2014 : 41) recommends a socially-based approach to lion management: 'management-assisted colonizing lions' at reserve levels. This involves lion population management through interaction with the small reserves. Funston & Levendal (2014: 41) outline the key elements to managing the meta-population as:

- 1) Simulating natural social-based population regulation and space use patterns at the level of each reserve, and
- 2) Switching male coalitions and females between reserves on a sufficiently regular and irregular basis respectively to maintain typical tenure lengths, minimize breeding with relatives, and facilitate natural mortality rates of cubs, which are ethically challenging to simulate in any other ways.

⁵ Trophy hunting is a legal recreational practice where people pay for the experience to hunt selected wildlife and keep a trophy of their kill, such as tusks, a head or hide of the animal for display to represent their hunting success (Humane Society 2016: 2). It is sometimes used in the name of conservation (Humane Society 2016: 5).

This plan requires collaborative management. As significant aspects of the proposed meta-population management approach are untried, the implementation must be monitored and evaluated closely to work, with lessons learned informing the adaptive management process (Funston & Levendal 2014). Implementing these approaches to management is likely to be costly and logistically challenging but important.

3.2 Understanding wildlife communication and public relations: Yellowstone National Park as illustrative case

Yellowstone National Park (YNP) was established as the world's first national park in 1872 (US National Park Service 2016a). It has developed to incorporate a strong mission allowing people to observe animals functioning in their natural state. In terms of human safety and dangerous animal and human conflict the key management plan is the development of the bear management plan in 1994. Codes, policies and laws dictate required distances between visitors and other dangerous animals such as coyotes, wolves and cougars⁶. YNP have several firm policies in terms of proximity to animals, employment of specific viewing areas and 12 visitor information centres that assist in the management of human behaviour in the park (US National Park Service 2016a). It is similar to KFI in that high numbers of visitors make their own way through the park in vehicles or as bush walkers, and camping is a common accommodation form. Some of the problems that are faced by QPWS in K'gari-Fraser Island are paralleled in YNP and other parks in the North American context. Using data gathered from Associated Press, Richards (2016) documented a 20% rise in human-animal conflicts or penalties for human infringements in 2016. Many of these incidents relate to visitors breaching area access codes, permissible proximity to wildlife and feeding (Richard 2016).

The following section of this literature review will explore some of the innovations used in the North American context more broadly, and YNP specifically, that contribute to an interpretation-led agenda of national parks' communication and management of human-dangerous animal relations. The two species with the highest profile in terms of conservation and management in Yellowstone National Park are wolves and bears. While wolves' canid link with dingoes provides the most obvious parallel with the issues in communicating dingo management strategies in the K'gari-Fraser Island context, issues involving bears have many significant parallels.

⁶ There is research on coyotes which present many of the same finding in human dimensions of wildlife management to wolves. Coyotes present a meaningful research comparison to dingoes in size and scavenging behaviours, but wolves are used as a focus test case here due to their iconic nature and apex predator position, a parallel to K'G K'gari-Fraser Island dingo.

3.2.1 Wolves

The wolf as a canid seems to be the dingo's most obvious counterpart in wildlife management internationally. Wolves are selected as they are a canid that shares the symbolic duality of kin in being likened to both domestic dog and howling predatory 'other'. The wolf also shares the dingo's vilification among agricultural animal production (ranchers in the US and beef and sheep farmers in Australia). There are obvious differences in size of the animal. More importantly, there are significant differing geographical contexts between K'gari Fraser Island and Yellowstone National Park (scale, isolation, density of predatory animal population). These differences occur between all conservation parks internationally; no two are identical. The focus here is on management practice through the lens of the like and distinct human dimension of wildlife management and communication in two developed, anglophone contexts. Hence the focus is on the wolf and then bear, in order to illuminate dingo management communication.

The literature indicates (and this is affirmed by ranger and biologist video clips on the YNP website) that wolves are not associated with human harm and certainly not deaths. Some go as far as to say it has not been proven that wolves kill humans in the North American context (Heinen 2007). A subsequent significant difference in management strategies used in the Yellowstone as opposed to K'gari-Fraser Island context is that YNP does not seem to use regular lethal management of its apex canid predator.⁷ The YNP website makes the following statement reflecting 20 years of management: 'To date, eight wolves in Yellowstone National Park have become habituated to humans. Biologists successfully conducted aversive conditioning on some of them to discourage being close to humans, but two have had to be killed' (US National Park Service 2016b). Aversive conditioning takes the form of aggressive repellent action, such as using rubber bullets, which hurt but don't kill wolves. Also called 'negative conditioning', these actions are designed to condition wolves to avoid humans. Some theorists posit that aversive conditioning is unnecessary for wolves, who are not in fact attracted to humans (Povlitis 2016).

It appears the routine euthanising of canids is not supported with only two deaths in 20 years since the wolves' introduction. Wolves are killed outside of the park, primarily by those protecting livestock interests or occasionally for sport (*Sky News* 2012; Shoemaker 2007). There are legal wolf harvests and significant lethal predator control programs across the US, by licensed hunters and US National Wildlife Services, including near YNP (Bergstrom *et al.* 2013).

While the US National Park Service reports that only a minor percentage (12%) of the YNP wolves are killed in these legal hunts, an estimated 32% of the wolf population in Idaho and Montana was killed in one year from 2009 to 2010 (Bergstrom *et al.* 2013). Bergstrom *et al.* (2013) argue the rate of legal wolf kills is unsustainable to the North Rocky Mountain

⁷ This conclusion is based on thorough exploration of publically available information and research. YNP staff have not yet responded to requests for interview/email queries.

population and recommend that lethal wildlife control for livestock protection is ineffective and wasteful. Further, review of over 100 peer-reviewed studies found flaws in studies justifying lethal predator control policies (Treves, Krofel & McManus 2016).

The wolves of YNP are an experimental population introduced from Canadian stock in 1995 after a previous attempt to eliminate them as predators risked the wellbeing and sustainability of other mammals in the park (US National Park Service 2016c). Their introduction was initially controversial. The first issues for YNP, especially in terms of the inability to prevent the wolf packs' movements into surrounding areas, were the potential impacts on livestock fatalities for local farmers, and the question of whether they were the right wolves to introduce (US National Park Service 2016c; Zumbo 2013). Additionally, locals and park visitors alike expressed concern over the threat to human safety and children. So the initial focus of YNP communication was in terms of negotiating a message of low risk to humans and human concerns.

The wolf has long been mythologised in human culture and folklore as the essence of wild predation (Marvin 2012). Ironically, in more recent years, YNP has had to dilute this message against unanticipated high numbers of wolf watchers coming specifically to observe pack behaviours. An entire community has emerged using long-range photography and seasonal (sometimes even daily) visits, structured through tours or self-directed visitation. Many of these visitors track behaviour and assist rangers with data gathering on a daily basis. In response to these high numbers YNP has instituted policies governing how close visitors to the park may go to wolf packs they come to observe. Based on analysis of the YNP website it appears the Park does not extensively use lethal management for wolves (US National Park Service 2016c).

Interestingly, exploration of the YNP website has not to date uncovered a parallel dedicated Yellowstone wolf management strategy (see also footnote 3). It appears that as wolves travel broadly in the states surrounding YNP, they are covered by Idaho and Montana legislature and management strategies when in those geographical areas and when within the park are protected from hunting (Zumbo 2013). Instead of an overarching strategy YNP releases annual reports on wolf populations and management. These appear transparent about all aspects of management, presenting some contrasts with dingo management on K'gari-Fraser Island. The annual reports include information that is gained through citizen scientists and the rangers and scientists employed by the park. The 2014 annual report included detailed information on all packs, diet, genetics, births and deaths and descriptions of all wolves handled and tagged in that year:

There were at least 104 wolves in 11 packs (figure 1), including nine breeding pairs, living primarily in Yellowstone National Park during December 2014. From 2009 to 2014, wolf numbers have fluctuated between 83 and 104 wolves, and 6 to 9 breeding pairs. Pack size in 2014 averaged 9 wolves (range = 2 to 14). Forty pups survived to year-end, including 17 in northern

Yellowstone and 23 in the interior of the park. An average of 4.4 pups per pack (82%) survived in the nine packs that had pups (figure 2). For the first time, the size of a wolf pack was estimated via genetic sampling methodology, using scat samples from a den site. (Smith *et al.* 2015: 2)

According to these reports there has not been a wolf attack on humans in YNP (US National Park Service 2016b). The YNP 2014 wolf annual report mentions seven instances where wolves approached humans, involving four particular wolves. In some of those instances hazing methods were used to deter them ('yelling, clapping hands, honking the horn, paint balls, bean bags, and cracker shells') but four of five hazing attempts were unsuccessful (Smith *et al.* 2015: 4). YNP has its own peer reviewed scientific publication⁸ in addition to these annual reports and a handbook resource to inform and educate staff and the public.⁹ These resources position YNP as a 'trusted advisor' on park management and provide frequent opportunities for the Park to control educational outcomes.

Even given these successes, current research recognises that as wolf and human populations grow in the Greater Yellowstone Ecosystem, the likelihood of interactions, positive and negative, increases. Professor Susan Clark from Yale University Ecology School reinforces concerns over human behaviour in a description that could be applied to some K'gari-Fraser Island tourist behaviour:

It's more like going to a carnival. If you look at the cumulative impacts, the trends are not good. The basic question is, 'What is the appropriate relationship with humans and nature?' We as a society have not been clear about what that ought to be, and so it's really, really messy and nasty. (Clark in Richard 2016)

3.2.2 Public acceptance of wolf management strategies

Traditionally, wildlife professionals and scientists have emphasised science and sought to exclude emotional considerations and anthropomorphism from the decision-making process (Daston & Mitman 2005). Yet, new research contends that emotional responses are at the heart of human conflict with, and attraction to, wildlife, particularly with respect to charismatic species such as wolves and grizzly bears (Roemer, Vaske, & Taylor 2011). Roemer, Vaske & Taylor (2011) sought to isolate the influence of emotions from cognition ('thoughtful thinking') to explain the variability in human acceptance of wolf management actions.

A survey of both residents and visitors posited scenarios with both situational and emotional variables. Situational variables included location of wolf encounter and status of

⁸ 'Yellowstone Science is a publication devoted to Yellowstone's natural and cultural resources. *Yellowstone Science* features articles about research, conferences, or other special events in the Greater Yellowstone Ecosystem, provides scientists with an opportunity to communicate and exchange ideas, and keeps the public informed about scientific endeavors in and around the park. *Yellowstone Science* was first published in 1992' (US National Parks 2016e).

⁹ 'The *Yellowstone Resources and Issues Handbook* contains information about the park's history, natural resources, cultural resources, the science and research conducted in the greater Yellowstone area, and critical management issues facing Yellowstone National Park' (US National Parks 2016d).

wolf population. Emotional variables ranged from sympathy for ranchers to sympathy for wolves and anger about wolves. The survey results were subjected to rigorous statistical analysis in order to explain acceptance variability. The greatest variance in acceptability of wolf management action was explained by emotions, most markedly in the case of lethal actions. While acknowledging that measuring emotions is challenging, it is argued that this topic should be more fully explored as a critical component of the human dimensions of wildlife management (Roemer, Vaske & Taylor 2011). This is consistent with other recent research into the role of emotions empathy and anthropomorphism in the communication of conservation messages. Anthropodenial of animal sentience can be harmful in conservation discourses that distance human and animal (de Waal 2009 in Burns 2014). Burns (2014) discusses instead the need to use narrative and anthropomorphism to create a discourse that does not privilege human concerns over animals and promote empathy and emotional connection. This can be in line with interpretation aims of human visitors in national parks as stewards and can be congruous with messages of non-intervention, physical distance and safety (Root-Bernstein *et al.* 2013). Anthropomorphism can exist without empathy. However, media uptake of, and human responsiveness to, messages that treat animals with emotional connection, individuality and empathy have been demonstrated as successful in many cases. One example is Iain Douglas-Hamilton's use of intimate connections, morphism and photography to sway public opinion and politician support for the necessary aspects of elephant conservation in Africa (Mitman 2005).

3.2.3 Bears

Bears (alongside wolves) have been described as the most charismatic of the North American wild animals (Roemer, Vaske & Taylor 2011). The issue of charisma and human attraction to such animals in the literature is instructive in consideration of communication planning to ameliorate human-dingo interaction in the K'gari-Fraser Island context. Animals such as wild primates, canids and ursidae are highly valued in many human cultures through perceptions of likeness (as opposed to otherness with animals such as reptiles, birds and particularly marine life and insects). Kellert (1994: 46) argues that bears appeal to humans because of their 'phylogenetic similarity to people, high intelligence, aesthetic appeal, relatively large size, capacity to stand erect, omnivorous diet, and rich historic and cultural relationship with people'. For dingoes and wolves, a similarity to our most popular inter-species relationship, the dog, along with perceptions of intellect, and aesthetic appeal makes the human attraction to them potentially even stronger.

The management of bears in the North American context has taken a strong human focused redirection since approximately the mid-70s when concern for conservation began to outweigh concerns for human safety. The human-focused approach to bear management (and wolves / coyotes or any other animal susceptible to scavenging) in both national park and broader community contexts finds expression in the closing of all garbage dumps around national parks. This detritus containment is consistent with K'gari-Fraser Island management practice. The connection between human detritus diets, human habituation

and dangerous human-bear conflict was well established by the 1990s (Mattson, Blanchard & Knight 1991; Herrero 1985; Meagher & Fowler 1989; Mattson & Reid 1991). Such a connection has recently been nuanced through a distinction between habituation and food conditioning.

‘Habituation’ is a term used in wildlife management to define the waning of normative behaviours following human exposure. It often refers to loss of a fear response due to frequent exposure to humans without negative outcome (Bernstein *et al.* 2006; Herrero *et al.* 2005). Habituation is distinct from food conditioning in the latest human dimensions of wildlife research in terms of likelihood of human-animal conflict. Such research positions food conditioning as a far more stable predictor of the likelihood of human animal conflict than animals becoming habituated. This is not to say that habituated animals are never involved in human conflict, but that habituation may not determine such conflict (Decker, Riley & Seimer 2012). This may be especially true in the case of animals with history of symbiotic and scavenging relationships with human beings. In the Yellowstone context management of the grizzly bears in Yellowstone has focussed primarily on making human foods unavailable to bears, with all dumps in the region closed in the early 1970s (Mattson & Reid 1991).

Twenty years later some of the gravest concerns in terms of bear conservation lay with richness of food source, availability of bear habitats even within YNP, and with low bear use of suitable bear habitat (to do with issues like climate change, reduction in bear habituation via bear fear, and human ‘harvesting’ (hunting) (Mattson & Reid 1991). It is likely that grizzly bear habitat has been most enhanced by the creation of bear management areas in YNP, where humans are permanently or seasonally excluded. Exclusion and closing of areas of parks in line with animal seasonal behaviour changes is also consistent with park management practice in K’gari-Fraser Island. The listing of grizzly bears as an endangered species in the mid-70s also has impacted on the recovery of bears, and now they are facing potential delisting, though will continue to be protected in YNP (US National Park Service 2016f). The creation of bear management areas, however, can constitute a ‘habitat island’, limiting carrying capacity and increasing vulnerability to habitat or population loss (Mattson & Reid 1991). In the 90s Mattson and Reid (1991) stressed the need to maximise native / original food sources to prevent bear habituation to humans.

Research continually points to the need for strategies for non-lethal management of human-habituated bears and for educating humans to mitigate risks associated with bear encounters. There are human social implications involved in integrating lethal management in conservation activities, including but not limited to reduction of interpretive aims of visitor stewardship through alienation from nature, and loss of public support and harm to the public relations of the management organisation (Wallach *et al.* 2015). The implications for habitat of isolation and climate change also need to be seriously addressed to protect the long-term viability of Yellowstone grizzly bears. This will also have an impact on all the

ecology of K'gari-Fraser Island (See, for example, Ivanovic 2015; Hadwen & Arthrington 2011).

Yellowstone National Park endorsed and implemented a specific bear management strategy in 1996 (and it appears not to have been updated since that time). This strategy has many parallels with the FIDMS in that it covers areas such as:

- Compulsory reporting and documenting of human-bear incidents
- Bear aversion / hazing strategies such as sling shots and use of thumper gun, cracker shells and bear deterrent rounds (with much approval of processes and training)
- Relocation of nuisance bears
- Specialist bear proof garbage disposal spaces
- Routinely closing down areas of the park (bear management areas)
- Some lethal management of food conditioned bears (Gunther 1994).

YNP communication stresses the significant drop in lethal management of bears in the wake of first 1970 garbage management strategies and then the 1994 Bear Management Strategy, particularly the further management of human detritus, feeding and creating management areas closed to humans at seasonal times (US National Park Service 2016a). In this sense, the management plan is human-focused although the sporadic allowance for hazing, relocation and lethal management is clearly focused on corralling animal behaviour. There is a human injury caused by black bear attack less than once every 7 years in the last 30 years and less than once every 18 years in the case of grizzlies. The lethal management rates are less than one a year in the Yellowstone context (US National Park Service 2016g). These figures are published freely as part of the Yellowstone National Park annual reports.

The transparency around human-animal conflict, lethal management rates and methods is a positive initiative in terms of YNP public relations communication and may improve compliance with the bear and wolf management strategies. This is a factor QPWS communication planning may wish to consider in light of ongoing stakeholder perception of excessive and unwarranted dingo culling. The Bear Management Strategy is supported by the 'A Bear Doesn't Care' and 'Be Bear Aware' communication programs, discussed in the next section of this report.

While there is transparency around human-animal conflict in YNP, there is (parallel to K'gari-Fraser Island dingo context) substantial outcry about the lethal predator control in the name of livestock protection close to park and conservation areas by US federal Wildlife Services, and the lack of transparency in numbers killed and areas where lethal control is conducted. Many animal advocacy organisations such as Wild Earth Guardians, Predator Defense organisation, The Humane Society, Mammal Society, Advocacy for Animals, Earth Island organisation, and various scientists and researchers from academic institutions oppose the policies, methods and models used in the name of controlling wildlife, and argue they are

cruel, excessive and do not work¹⁰ (Wagner & Stoddart 1972; Henke & Bryant 1999 in Bergstrom *et al.* 2013; Treves, Krofel & McManus 2016). Coyote advocates argue that lethal control of wildlife such as coyotes does not work, because the coyote population, for example, adapts and increases as a result. Coyotes are an interesting parallel for dingo management due to their scavenging behaviours and similar size.

3.2.4 Yellowstone and North American communication and interpretation

Yellowstone National Park, like many other World Heritage listed parks internationally, exploits ranger stations and interpretation centres on location as key sites for community engagement and communication with the public. There are two forms of ranger station. One form comprises commercial enterprises run by volunteers and friends to the YNP and includes bookstores, exhibits, trip planning literature and souvenirs. The educational centres operate in conjunction with these centres and are operated by park rangers. In addition to these ranger stations, YNP has an extensive education and interpretative program which includes ranger-led activities and 13 visitor centres; youth ranger, conservation and scientist programs; and educational media, such as park newspapers, information handbooks, guides, brochures, apps and social media (US National Park Service 2016h). There also exists a Grizzly and Wolf Discovery Center (2016) in West Yellowstone with live exhibits and a focused information centre (Gore 2004). YNP has a dedicated Interpretive Planner who works 'with rangers, media designers, partners in education, and even outside tour guides, to ensure that visitor information is accurate and consistent' (US National Park Service 2016h). Focused financial support and operational role dedication results in cleaner communication of key conservation messages. The key site of YNP communication and interpretation beyond the physical park is the website. It presents as an effective communicative vehicle.

The bear is a species with some significant management parallels with the dingo in terms of human risk due to a common attraction to human detritus and scavenging. In terms of interpretation, communication and education a significant document is Meredith Gore's (2004) comparison of intervention programs designed to reduce human-bear conflicts in North America. Gore (2004) suggests that each of the cases she explores evidence a common root cause to the issue of human-bear conflict: human behaviour, which she divides into irresponsible, inappropriate, unintentional, or intentional behaviours. Gore (2004) also categorises behaviour into three levels: predatory/aggressive; defensive; and nuisance. The latter two provide some nuance of existing QPWS categorisation of human-dingo interactions, which appear to be focused on degrees of severity and aggression rather than different types of behaviour altogether.

Gore (2004) points to four components of successful bear education and interpretation that have resulted in a reduction in human-bear conflict. These include bear alertness and

¹⁰ See for example, <http://waronwilderness.blogspot.com.au/p/vote4wilderness-and-usda-wildlife.html>

understanding of biology (resulting in behaviours around avoidance and food storage activities), which are very much in line with the FIDMS '*dingo-safe*' message, as Beckmann (2010) has established. Such increased knowledge can affect support for conservation activities. The other effective components of education and interpretation are participation in wildlife decision-making processes and community engagement with policy development. Gore (2004) stresses that participatory engagement of all stakeholders is vital in the successful implementation of education and interpretation. Lauber, Knuth and Deshler (2002: 581) assert that education should not:

be construed as an opportunity to advance a particular agenda or an agency's view of what should be done...education should be conceptualized as a way to help people make informed choices about what they think should be done in a particular situation, or what they can do personally in their interactions with wildlife.

Some key innovations in Gore's (2004) review of communication and education processes include innovation in rubbish and food containment and engagement with community groups to create parallel activities, such as cultural events and business links to better promote education messages. The New York State Department of Environmental Conservation Forest Rangers has focused on educating trekkers and campers before entry into the park and the development of bear- (and potentially wolf and coyote) proof food storage containers. These containers were hired out by rangers on entry to the park with credit card deposit to ensure return of containers (Gore 2004). The focus of the communication accompanying permits and encouraging the hiring of correct food and rubbish containers is on the impacts of human-bear conflict on *bears* (food conditioned bears can become ill, aggressive, lose natural desire to forage) as opposed to the danger to human beings in such confrontations. The appeal to altruism is a point of difference with some elements of the *dingo-safe* material. Although it must be said in all communication with rangers working on K'gari-Fraser Island, the public will encounter information on the risks to dingoes from habituation.

The 'Be Bear Aware' campaign across Canada focused on education about intentional and non-intentional feeding as well as measures such as calm encountering and dog control. An innovative communication strategy used in this context is the use of the ranger 'night raid': under cover of darkness, garbage bins or camper food storage that is bear accessible was marked with a bumper sticker saying 'Be Bear Aware'. Rangers reported a reduction in human bear interactions and negative food storage practices in the immediate period after this point (Gore 2004). In the 'Be Bear Aware' context (as with the Bear Smart and Bear Wise campaigns) the need for social science research paradigms of persuasion theory, conflict resolution and human conditioning are seen as vital in the literature (Baruch-Mordo *et al.* 2009).

3.2.5 Community engagement

The successful 'Be Bear Aware' initiative was defunded in 2003. Recent communication with organisers reveals that it is continuing through community volunteers' work with over 50 presentations each year in communities in north western USA. The group also researches and develops new bear safety information tools every year. A representation of the group stated that some of the communication is 'unfortunately often seen as entertainment not important safety information' and that this blasé attitude is reinforced by lack of political leadership and focus on the issue (Bebearaware.org representative, personal communication 2016, 14 June).

The Bear Preservation League comprises key stakeholders in the 'Be Bear Aware' campaign. They have collaborated with park rangers, been willing to receive training to act as volunteers to deal with bear complaints and provided community education to ensure the reduction of bear euthanising (Gore 2004). There have been other examples of National Parks' collaboration with external community-based animal protection stakeholders in the interests of ameliorating human/ bear conflict, such as the 2003 Tahoe Council for Wild Bears partnership with Safeway supermarkets:

Safeway stores in California and Hawaii distributed one million paper grocery bags that display a 'keep bears alive and wild' message. An artistic illustration of a bear, accompanied by important tips on living in bear country has been praised by partners as cutting across demographics and encouraging responsible behavior (bagging and properly disposing of trash). This is an especially interesting education intervention, as it uses food as the mode of intervention as well as using food as the central component of the educational message. (Gore 2004: 12)

At the time of writing, Central Florida provided an anomaly for Gore's (2004) review in that bears are protected in this region. In the Florida context harnessing of community group action has resulted in the Annual Umatilla Bear Festival (Florida Fish & Wildlife Conservation Commission 2016). Given the numbers of local visitors and related issues this may be a good template to model in terms of forms of productive community collaboration resulting in positive interpretation outcomes.

The question of resourcing and cost to manage visitor viewing and expectation in YNP has been the topic of some recent research. For example, allowing visitors to view the Park's healthy population of black and grizzly bears from the roadside has been successful, both in promoting appreciation for the resident wildlife and allowing the bears to continue using roadside habitat. However, in the high viewing season from May to September, the park staff hours required to control traffic and prevent 'bear jams', and to monitor visitor behaviour, have grown exponentially. Questions arise as to whether this allocation of resources is warranted. Thus a detailed visitor survey was conducted in 2009, including questions about actual expenditure within 60 miles of Yellowstone National Park, and

hypothetically how visitation would change if there were no bear viewing or if park entry fees were increased to cover the costs of managing bear jams (Richardson *et al.* 2014). Richardson *et al.*'s (2014) study demonstrates that, on economic grounds at least (tourist expenditure, jobs and tourist willingness to pay high park fees to facilitate higher quality experience and perception of bears), the decision to allow roadside bear viewing and the staff to support it is justified. While there are no formal viewing processes (no hides, dedicated education centres nor viewing platforms) in the K'gari-Fraser Island context, this presents another interesting insight into ways to manage tourist expectation, cost and resourcing.

3.3 Communication implications from wildlife management beyond North America

There is a consistent theme in the literature more broadly that it is necessary to educate tourists and thus influence their behaviour not only at the tourism site but in their home and work environments prior to and beyond that wildlife experience (Ballantyne & Packer 2005; Shultis & Way 2006; Newsome, Dowling & Moore 2005). Extending communication activities through partnerships with community groups may be a way forward to promote *dingo-safe* messages as conservation messages. This might include commercial partnerships, sponsorships, or community events like the student-led event created at USC and discussed elsewhere in this report. Many visiting the Island are not clear on the capacity of dingoes as wild dogs or underplay the relationship between the minutia of their own actions and dingo conservation. The message and understanding of dingoes has potential to be as pervasive as understanding of ocean rips or swimming pool management in the wider community.

Kruger National Park has an environmental education programme that focuses on school groups – student and teacher groups, 'local community groupings, special interest groups and the KNP's staff' (Freitag-Ronaldson *et al.* 2008: 103). SANParks management state they convey practical messages to park visitors and the neighbouring community about the dangers of feeding wildlife (hyenas, baboons and monkeys) and the ways to prevent human-animal conflict, such as using chilies and bees to keep elephants off crops (SANParks representative, personal communication 2016, 7 May). Other strategies conveyed to stakeholders include messages for livestock owners in Kenya on how to prevent lion attacks by corralling cattle into enclosures, and how to build strong enough enclosures.

3.3.1 Communication impediments and conflicts

In their study, Peake and Carter (2014) examine the conservation interpretation and visitor communication in Kruger National Park. Their study and the 2008 Kruger Management Plan both emphasise the poor state of the interpretation centres. Peake and Carter (2014) argue that there has been a decline in interpretation and ranger education /communication practices for visitors to KNP over the past 17 years and that the interpretation programme does not communicate the core values of the park or organisational objectives, nor interpret the conservation requirements of featured species and habitats. While camps have centres with some interpretive information, there is minimal information elsewhere. In a

presentation about KNP's interpretation communication, Peake (2013) notes the lack of basic information about ecosystems and animals; lack of conservation messages and educational value; lack of themes; and summarises that, in general, the 'material is outdated, faded, poorly produced, incorrect'. As such, Peake and Carter (2014: 296) surmise that visitors leave with a narrow view of savannah conservation because of the lack of information and interpretation:

There is a missed opportunity to use interpretation as a tool to support conservation management action, meet the needs of tourists for information that enhances experiences and ensures understanding of safe behavioural practices, and explain the iconic values and significance of KNP.

Peake and Carter's (2014) findings support Anthony, Scott and Antypas' (2010) suggestion that KNP's adaptive, participatory, public consultation management approach is not without deficiencies. A further significant reason for clear interpretive communication and communication about management policy and strategies to the public and stakeholders is to minimise public mistrust and misinformation about conservation management and safe practices. These weaknesses in KNP interpretive communication are largely due to capacity limitations, including lack of staff and transport, inaccurate and under reporting, poor response time and poor communication between governance authorities and with other stakeholders. This has led to mistrust between management institutions and community stakeholders and inaccurate data on which to base management policy. By comparison, Yellowstone National Park is far more successful in interpretive communication and management strategies resulting in substantial positive outcomes for wildlife conservation and human safety.

Bath & Enck (2003) provide some insight into the reasons why some community members do not respond to wildlife management communication. These include dissonance between existing beliefs and the communication message, mistrust of the wildlife agency, economic factors, and incongruence with other valued experiences (Bath & Enck 2003). While this study's focus is on why people do not take up an explicit conservation messages or value rather than comply with safe practice, it still provides an instructive framework to consider stakeholder responses. Similar to Bath and Enck's (2003) findings, Gore and Knuth (2006) suggest that the reasons behind complying with wildlife management communication are complex. Their research focused on the NeighBEARhood Watch program in New York State and found that participants sighted signage frequently but did not necessarily absorb messages in signage, and the fact sheets and brochures were found to be more illuminating. The study found compliance was not influenced by age or gender, rather experiences (or information about experiences) were compelling effectors of change (Gore & Knuth 2006). The research suggests that a focus on narratives of negative experiences (and positive experiences) consistent with a *dingo-safe* strategy (akin to strategies used sometimes in

health promotions around quitting smoking for example) may yield more compliance than simply instructing stakeholders on advisable behaviour. Additionally, stakeholder agency and consultation are named as crucial factors in communication strategy efficacy, thus collaboration is a significant indicator of success (Gore & Knuth 2006).

There is strong evidence that the reasoning behind and transparency in communication of controversial management practices (such as lethal management) effects popular response to key terms such as nature, effectiveness, environmental impacts and overabundance. Animal welfare clarity and use of discourses of what is natural are vital in communication (Dandy *et al.* 2012). Clear communication is also supported and acted upon where there is a precise correlation between belief in the outcomes of a management policy and attitudes to that outcome. Lack of information and uncertainty in terms of ambiguity around research is harmful to public support (Lauber *et al.* 2007).

Communication is complex where stakeholders are often not in agreement. One site where settler and Indigenous debates are staged, gives the entirely different value placed on the predatory animal in question. Young *et al.* (2015) conducted focus group discussions in four rural communities in the American west on human-wolf conflict. Participants came from three groups in each locale: ranchers, non-ranchers, and tribal members, with members of the latter two groups all having background/experience in wildlife management or conservation. This research exposes the immediacy of communities dealing with a local large carnivore population, compared to the more anodyne quality of public discourse about conservation. The research revealed that perception of the dangers presented by large carnivores to pastoral concerns is significantly exaggerated, particularly among the rancher group. For example, the actual cost of livestock depredation by wolves is 0.01% of the total income generated by livestock production. All participants extensively quoted anecdotes of other people's conflicts with carnivores. Wildlife managers' frustration at misinformed opinion and politics overriding conservation science was met by local stakeholders such as ranchers' belief that decisions are made by 'city people' ignorant of the realities (Young *et al.* 2015). By contrast, the tribal members referred to the animals as part of their cultural heritage and to a 'special kind of spiritual contact' (Young *et al.* 2015). It is noted that focus group tribes have their own wildlife management agency; they do not view government agencies as influential. Tribal participants also favoured adaption strategies to address human-carnivore conflict issues, for example discouraging human presence in certain areas. Ranchers by contrast expressed resistance to changes to ranching practices or lifestyle to minimise conflict. The debates in these international contexts are often posed between those involved in a conservation park management role and those who oppose the dangerous animals' presence: such as ranchers in the United States (Lynn, 2002). This is a contrast to the situation presented in K'gari-Fraser Island, where so much of the conflict regarding dingo management occurs from positions where all participants are self-defining as pro-dingo but through different interpretations of that term.

A second site of conflict in communication internationally around dangerous animal management is the animal protection interest versus wildlife management position. Perry and Perry (2008) have found that the philosophical differences between conservation biologists/park managers and animal advocates make cooperation very difficult. This is particularly because of the forms of ethics in ecologists', conservation biologists' and policy makers' worldviews and poor understanding of animal rights philosophy resulting in communication break down and combative interactions. These issues can be heightened when advocacy groups do not have access to research and factual information that may counter their pre-existing beliefs. But an operational truce between wildlife managers and animal rights advocates is vital to management practice because of the often-effective media use of the latter group and the necessity of confluence to operational effectiveness. Perry and Perry (2012) used case studies of proposed lethal management of grey squirrels and feral pigs to research the pragmatic potential of some cooperation and to locate the areas of agreement and disagreement. Ultimately the analysis concludes 'that managers should be more open to exploring nonlethal alternatives, and animal rights groups should understand the motivation behind eradication attempts and be more involved in providing the extra funding necessary to support preventative measures' (Perry & Perry 2012: 33). An issue for both groups is policy makers who care more about economic costs than ecological issues, but highly value their public image and can be leveraged through this. Much research agrees there is an entrenched history internationally of conservation managers/scientists and animal rights advocates relying on simplistic and stereotyped ideas of each other. Transcendence of these has much potential to create positive communication and animal management outcomes (Herzog 1993; Galvin & Herzog 1998 in Perry & Perry 2012).

3.3.2 Significance of clear and direct communication in addressing impediments and conflicts

In other wildlife parks and reserves such as Mon Repos Conservation Park, Corbett Tiger Reserve and Bandhavgarh National Park, conservation and safety information is conveyed via ranger guided tours. This personal approach is shown to have many positive outcomes (and this perspective is reflected in some stakeholder perspectives in this project's research). Clear communication of this information that includes the value and benefits of not interfering with the presence of wildlife is paramount to achieving positive outcomes. For example, Ballantyne, Packer and Hughes (2009: 663) found that safe (guided) wildlife handling and encounters can engender an emotional affinity and positively influence tourist conservation attitudes and behaviours. Clear explanation of the benefits in interpretation information to tourists and stakeholders is imperative to achieve this: 'the knowledge that they are accepting restrictions for the sake of minimal impact is likely to make the experience even more special for tourists.'

The website of Project Tiger provides practical and real documentation on the Indian government's actions in designated Tiger Reserves to both restrict humans' access to tigers for profitable reasons, but also to restrict human-animal interactions that can endanger lives (National Conservation Authority 2015). The website clearly communicates that to ensure human safety the National Tiger Conservation Authority (2015) has increased protection, networking and surveillance, relocated people and villages from areas that are critical tiger habitats, fostered awareness to encourage local support, and furthered research in order to manage interactions between humans and tigers.

3.4 Summary of international literature on human-wildlife interaction management

This literature review began by establishing some of the research on management strategies used internationally including engineering strategies such as fencing, detritus containment and proximity rules and protocols as well as periodic park area closures. It has also reviewed the current research interventionist strategies such as lethal management, fertility control and relocation. The literature generally finds that engineering methods and other ways of reducing human proximity and animal food conditioning are crucial management practices. Interventionist practices, such as lethal management, relocation and fertility control are more contested and frequently seen as inhumane, not beneficial ecologically, or as negatively impacting community perception of parks management.

The research literature explores the benefits of a human-centred approach to dangerous animal management. The role of education and interpretation centres and clearer signage are perceived as vital. Forms of communication that build in affect (that is, emotional response), narrative and anthropomorphism can be beneficial in ensuring steward-like conservation practices that will result in low human-animal conflicts. Personal and face to face communication, such as guided tours, are also perceived to be positive when conducted by appropriately trained rangers – or similarly experienced or qualified leaders – who can clearly communicate the benefits of restrictions or suggested behaviours. Much research points to the benefits of participatory and adaptive management practice. There is consensus in the research on the benefits of community partnership and collaboration to engage community and assist in the amelioration of animosity and contested perspectives amongst various parks' stakeholders. This review has located research into various creative ways to increase peripheral forms of communication such as community run festivals, volunteer programs and partnerships with tourism and commercial sector.

4. Analysis and commentary of communication positions of key stakeholders

4.1 Target audiences for dingo-related messages

QPWS is presented with a particularly complex group of stakeholders with which to communicate. This is exacerbated by a dingo management strategy that places much emphasis on the reporting of and acting on dingo behaviour, a strategy that is perceived to be punitive on dingoes by many in the community. The use of lethal management and the coding of inappropriate behaviours indicate this focus. In this context communication planning increases in importance, as does the need for a finessed and nuanced approach to communication, interpretation and public image management. There are some anomalies in terms of comparisons with international parks where dangerous animals are managed.

In the North American context ranchers live in close and accessible proximity to a national park and if wolves move outside YNP they can be shot. Similarly, in Africa destructive or dangerous animals can transgress park boundaries into villages or farmlands. In contrast, the K'gari-Fraser Island dingo as a predator cannot move beyond the boundaries of the Island. Whilst there is a range of different tenure types within the Park and surrounds, the whole Island is bound by the same legal obligations.

This difference in the way legislation and park management impact the human-dingo relationship, comparing cases like YNP with Fraser Island, produces a second set of critical anomalies. Unlike some international examples, in the Fraser Island context, most interest groups and visitors identify as pro-dingo. This does not mean there are no anti-dingo voices; these are obviously present in the periodic intentional running over of dingoes on the Island reported by rangers and in the recent intentional baiting of 6 dingoes at Orchid Beach in June (Johnson 2016). But the findings of this research show that those surveyed identify as supporting the dingo's presence on the Island in various ways. Additionally, stakeholders express a desire to have the dingo present and healthy, whether they are tourism operators, scientists, Butchulla traditional owners, residents, QPWS staff or others. But there is much semantic contestation on what it means to be pro-dingo.

This research conducted focus group workshops and interviews with stakeholder bodies or their representatives to gather data. Visitor surveys also captured the opinions of some of these groups with results reported in the survey analysis section of this report. The stakeholders' data come from the:

- Butchulla traditional owners
- Residents
- Rangers
- Scientific community
- Fishers
- Island accommodation providers

4.2 Semantic mapping

Semantic mapping (see methods section of this report for further explanation) was applied to identify themes in the discussion resulting from focus group workshop questions. Three different groups of people who form communities of place, communities of identity, or communities of interest, with respect to K'gari-Fraser Island were identified. The sampling strategy comprised a social catchment sampling framework that serves to identify different decision-making sectors representing a range of contributing communities (Wardell-Johnson 2005). This framework draws on a range of theoretical descriptions of communities and interactions in communities to ensure that a reasonable cross-section of voices has been extensively applied in landscape management research accounting for difference in nationality and geography (Wardell-Johnson 2007; Wardell-Johnson 2011; Wardell-Johnson *et al.* 2012; Ernoul & Wardell-Johnson 2013). The key components include identifying sources of conflict, which provides a means of identifying diverging positions and voices.

Four different sources of conflict are used to identify the different ways in which people value a situation: (1) definitions and judgements of situations (cognitive conflict); (2) goals and outcomes in dispute (values conflict); (3) the relative costs and benefits of a situation (interest conflict); and (4) the exercise of power which results in winners and losers (relationships conflict) (Duane 1997). In addition, these forms of conflict are a way of differentiating between status quo sectors who hold the power and subjugated sectors who are subject to power (McHoul & Grace 1993; Foucault 1991). Subject communities form with interests in common, in opposition to 'the other' identified on the basis of self-selected difference (Guattari 2000). These interactions are further differentiated between those included and engaged as the 'captured' community, and those who are critical of or disengaged from the politics of management as the 'critical' community (Whitehead 2003; Winter 2000).¹¹

Operationalisation of this social catchment sampling framework captures a range of community voices based on definitions of communities (Duane 1997):

- **communities of place** tied to a space through physical geography: residents and people with place-based connections living on the Island
- **communities of identity** tied to each other through social characteristics that may transcend place: including people involved in unpaid or conservation volunteer interests, absentee landholders

¹¹ It is worth noting here that out of all the stakeholders surveyed, only the rangers undertake interpretation and community engagement activities. They do this under the QPWS communication plan and to a standard set by QPWS.

- **communities of interest** who are beneficiaries of the place or contributors to the environmental condition through interest in the resources available: business interests, and public sector staff both on and off the Island¹².

Social catchments include people from all these categories or combinations of these categories who are linked to the Island in some way and contribute to the process of decision-making.

Butchulla people, as Indigenous landowners and holders of native title to K’gari-Fraser Island, are both communities of place and communities of identity. Another community of identity and place comprises people who live on the Island or have other personal connection to the Island through, for example, regular experience or involvement in decision-making. Communities of interest are those groups with economic interests on the Island. The third group involved in the semantic mapping is a community of interest, comprising rangers, who derive employment from the Island. The researchers acknowledge that rangers may also be considered within a ‘community of place or identity’ as many of them live on the island, but their financial interest in the Island (via paid employment) makes it important to distinguish their responses from those of other inhabitants. The fourth set of results show the perspectives of the NGOs and private sector, who also have economic interests in K’gari-Fraser Island. The final community of interest are scientists, who also derive employment indirectly from their research interests in K’gari-Fraser Island.

4.3 Community of place and identity: Butchulla people

A more detailed report on the perspectives of Butchulla people is given in Carter and Wardell-Johnson (2016). The main results are presented in this section, providing a detailed analysis of the relationships between all communities of place, identity and interest to capture all voices contributing to decision-making (either formally or informally).

Key concepts discussed by Butchulla people were “people” (100% connectivity ranking with other concepts), “dingoes” or “dingo” (confirming the subject of the discussions), “different” human perspectives and dingo behaviours, “beach”, “camp”, areas with a “fence”, “management”, “rubbish” and “tourists”. The semantic mapping of the perspectives of Butchulla people revealed three thematic clusters: people and dingoes, dingoes and rubbish, and K’gari-Fraser Island management (see Figure 1).

¹² Bus drivers, tour guides and tag-along drivers are one community of interest whose perspective would have been a valuable addition to this research. Regrettably no representatives of this group were available to participate in this research.

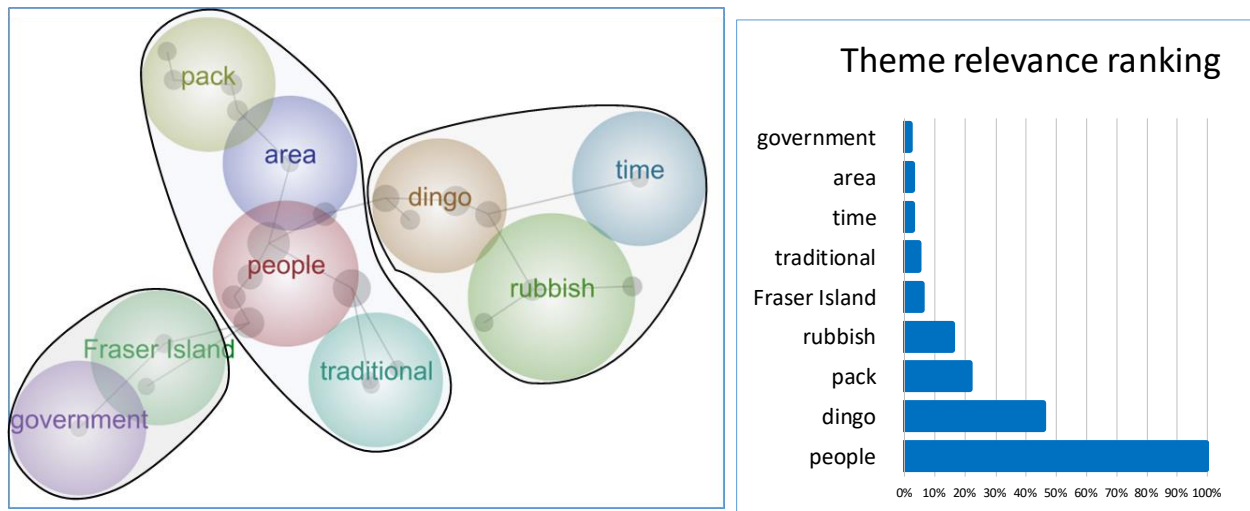


Figure 1: Thematic clusters (bounded by the black line) showing associated themes (the large circles that overlap) and theme relevance rankings.

Themes are groups of concepts that overlap (concepts are located as points within the circles). The relative size of the points indicates the degree of importance of each concept, for example, 'people' is a significant concept in its respective theme.

Table 1: Ranking of themes and concepts for semantic mapping of Butchulla workshop.

| THEMATIC CLUSTER | THEME | CONCEPTS | |
|---------------------------------|--------------------|--|--|
| PEOPLE AND DINGOES | People (100%) | people (100%), dingoes (75%), island (55%), Butchulla (25%), stuff (20%), things (20%) | |
| | Pack (22%) | pack (20%), camp (10%), dogs (15%) | |
| | Traditional (5%) | traditional (5%) | |
| | Area (3%) | area (5%) | |
| DINGOES AND RUBBISH | Dingo (46%) | dingo (35%), different (25%), management (20%) | |
| | Rubbish (16%) | rubbish (20%) | |
| | Time (3%) | time (25%) | |
| FRASER ISLAND MANAGEMENT | Fraser Island (6%) | Fraser Island (10%) | |
| | Government | Government (15%) | |

| | | | |
|--|------|--|--|
| | (2%) | | |
|--|------|--|--|

4.3.1 Thematic cluster – people and dingoes

As reported in Carter and Wardell-Johnson (2016), the thematic cluster “People and dingoes” includes themes such as ‘people’ (100%), ‘pack’ (22%), ‘traditional’ (5%) and ‘area’ (3%). This theme tends to represent the long-term relationship between Butchulla people and dingoes that has helped to form the unique cultural landscape:

So they (the elders in previous times) would throw them a few fish because these dingoes wouldn’t let you go onto the Island. So they would throw them a few fish and then the dingoes would go back up there so then the men could get ashore.

Our camp dogs they keep an eye on our young, you know our camp dogs helped us with hunting, our dogs use the ocean, not like the mainland dogs.

Butchulla people also desired that their cultural ties to dingoes continue to be portrayed to others:

They [QPWS] should maintain our sites, yeh representing Butchulla people.

When something is said about the dingoes, you never once hear any comments or anything from the traditional owners you know that’s what annoys me. You know you’ll have the reporters and news and everything, there’s nothing said about traditional owners.

They felt there should be better information transmission between managers, users and traditional owners. Information about dingo populations or packs was needed as participants were concerned for dingo health and wellbeing:

We get information from a lot of diverse people that go on the Island [about the state of the dingo population].

I just got back last week and I know people who have been there on holidays and haven’t spotted a dingo and have been there for a week or two.

Step by step they’re learning as they go, but a lot of it’s pretty useless because apparently the dingoes still get in [reference to exclusion fencing]. But it’s also knocking other things out of whack, because you get more snakes in those areas and you know these other animals are using them to hide out.

Other concerns were for domestic animals who had been on the Island before its declaration as a World Heritage area, for the decline of natural values of the Island, and that

tourists should be better educated or prepared about the risks of travelling in a Park environment. In addition to wildlife encounters, tourists seek permits for 4 wheel driving, fishing and adventure sports, many of which result in injuries (and deaths) which could be mitigated with improved communication.

A lot of international tourists don't understand the concept of the danger that's involved on the Island when they're driving on the Island – that's why so many people are killed there.

When the people that have all these permits to go there, a way would be to stop it, would be to get some young Butchulla people from around here to do all the driving and stuff, because these other people are inexperienced they've never been on sand before. There's that many things you can see if you do a risk assessment on what goes on over there – it's just horrific.

Semantic mapping of Butchulla focus group responses demonstrates the need for greater agency and consultation in management processes and desire for increased communication of Indigenous knowledge in various mediums on the Island.

4.3.2 Thematic cluster – dingoes and rubbish

The links between dingoes and rubbish constituted the second thematic cluster. Butchulla people were concerned that dingoes were seen as aggressive or threatening, possibly due to lack of food, and that this representation was not justified:

Whenever they decide that there's a problem dingo quite often that whole pack will pay for that problem dingo. And they're culling, they're culling too many.

Butchulla focus group responses indicate a feeling that visitors to the Island, and the lack of visitor access to facilities for rubbish, contributed to aggressive behaviour of some dingoes:

And locking the bins 20kms apart behind big fences, the Island is so dirty now. People are leaving their rubbish where their campsites are and that's causes problems with dingoes.

Bins 20 kms apart, maybe more – there's only about 3 or 4 of them enclosures on the whole eastern beach and there's rubbish everywhere.

They just leave the rubbish wherever they are and you just see it everywhere. Piles of it.

But before there used to be bins that were about 2kms apart hey. You know there would be all along the beach and would never be as much rubbish as what there is now.

These responses reveal a perception of connection between human detritus and negative repercussions for dingoes in the long-term, due to increased dingo interaction with humans.

4.3.3 Thematic cluster – K’gari-Fraser Island management

The third thematic cluster portrayed the complexity of dingoes as individuals, and of other creatures (including humans), suggesting that individual subjectivity be recognised in the business of government:

So you can see a diverse array of creatures that’s been brought over to the Island ... It’s a complex situation because of the government and the way they treat Fraser Island.

Butchulla people noted the diversity within their own community, in that some Butchulla people had been removed from the Island in the past, and the resident population had different options on, and interests in, dingo management. Some made the point, however, that knowledge changes and different perspectives do not affect their connections and rights to the island and its management. A formal Butchulla presence in dingo management could commence with using the Butchulla name for dingoes:

Butchulla people are all different, some are new here or there has been a gap in time and resources, which means that recent memories are different from the past. Our knowledges and experiences though are not yet highly valued.

I would like to see the Butchulla name for the dingo used.

4.4. Community of place and identity: residents and others with personal place-based connections

Key concepts discussed by this community of place and identity, other than “dingoes” (100%) and “Fraser Island” (37%) were “people” (35%), “visitors” (28%), “behaviour” (26%), “island” (21%), “natural” (21%), and “food” (21%) (see Figure 2). Six major themes were identified: dingoes, visitors, natural, reports, population and Fraser Island. These formed the basis of four thematic clusters – visitors (includes natural and dingoes), reports, population and Fraser Island (see Figure 3).

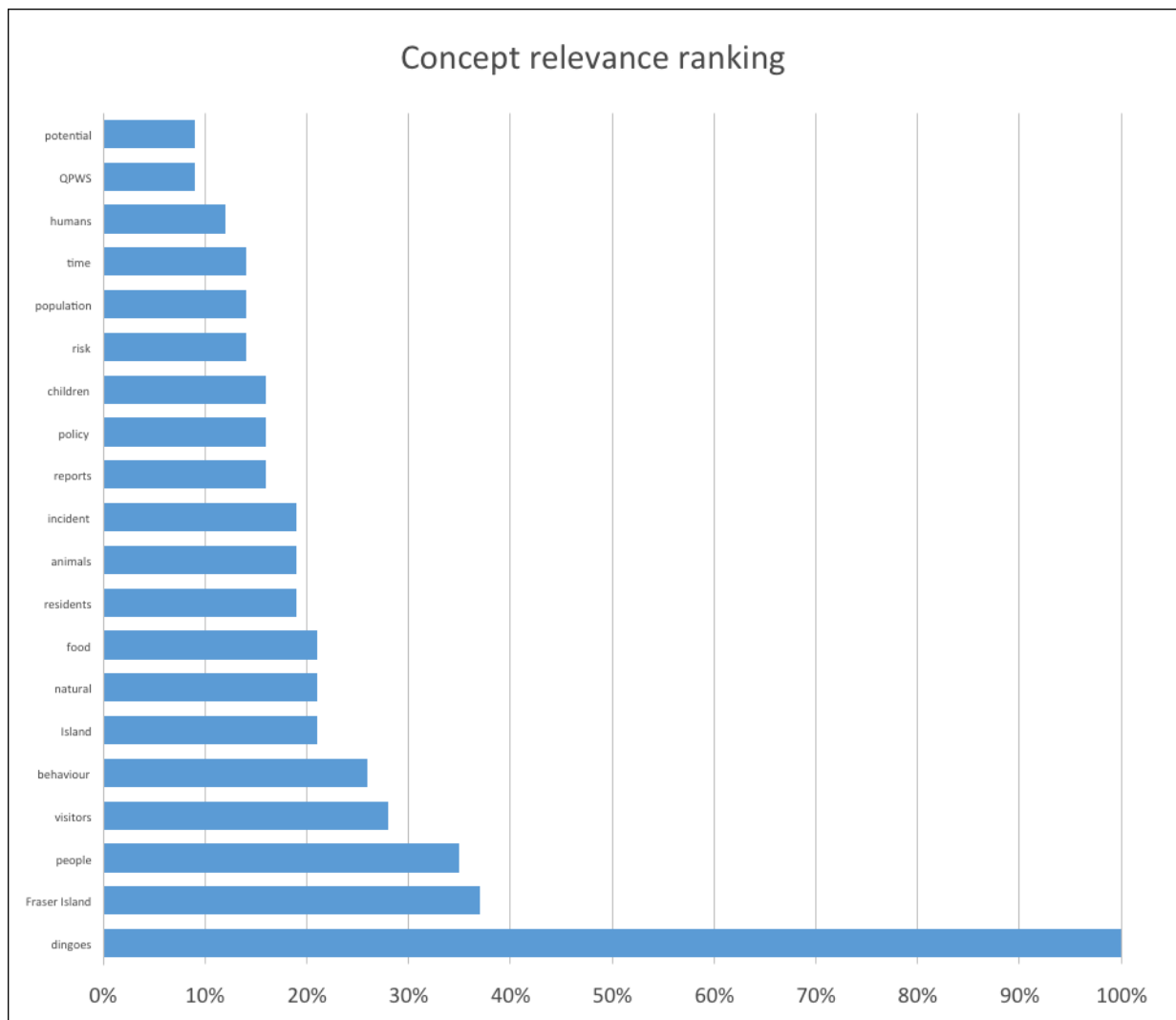


Figure 2: Concept relevance ranking: Communities of place and identity.

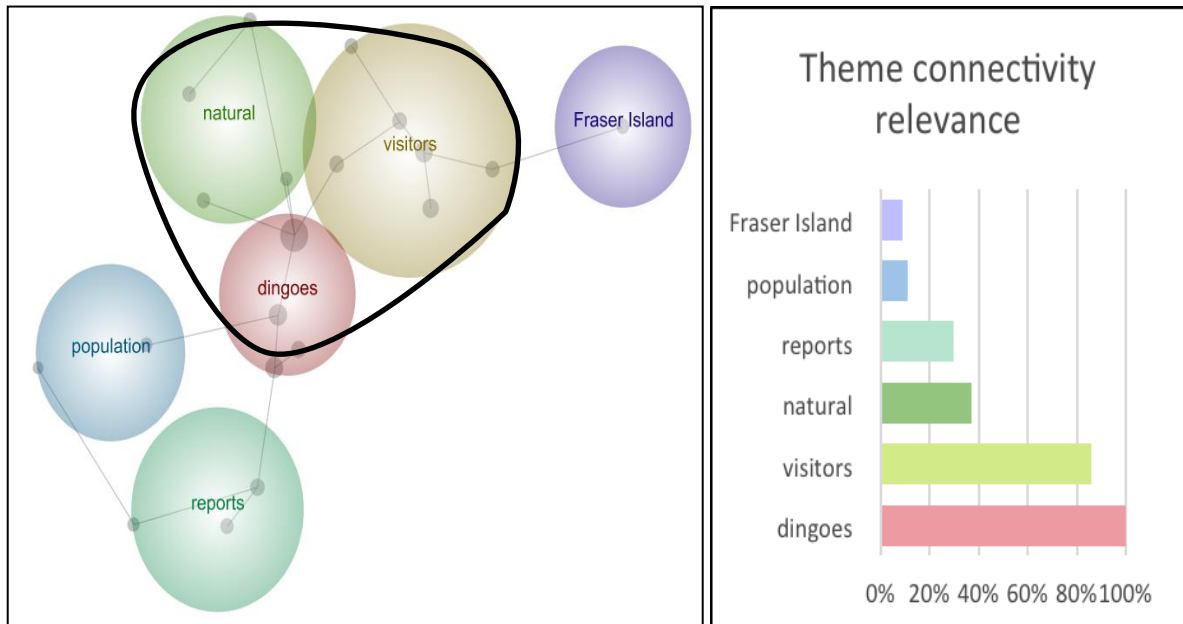


Figure 3: Communities of place and identity: Thematic clusters and their constituent themes.

4.4.1 Thematic cluster – visitors

The thematic cluster of visitors includes concepts relating to visitors, natural and dingoes. Participants in this community of place and identity suggested that visitors were to blame for dingo behaviour:

Parents watched as the child poked the dingoes with a stick.

It is known that backpackers do stupid things to draw dingoes closer, and then get scared and run and thus cause an incident.

I would say that dingoes are not dangerous to people at all when compared to deaths and injuries caused by drunk-driving, speeding, falling off sand-blows, car-accidents, snake-bite, and many other things.

Hazing and aversive conditioning have been shown not to work, and for all we know could be causing dingoes to see people as dangerous, become scared of them, and react defensively.

There are many reports of visitors throwing items at animals, attempting to harass and chase them, on the other hand there are also reports of visitors attempting to entice the animals for a pic.

Interestingly, no local residents have ever been attacked, nor have their children.

When dingoes were allowed to interact with people, they were always calm.

Such perspectives suggest coherence around appropriate human behaviour rather than dingo inappropriate behaviours. The views synergise around a need to convey messages that better manage humans in their interactions with dingoes. Some participants went so far as to suggest additions to the communicative focus:

The following is an outline of information: (1) Alert to the potential dangers that dingoes may pose, especially towards children; (2) Active in behaviours that minimise risk; (3) Refrain from feeding; (4) Refrain from inadvertent feeding; (5) Behave 'safely' around dingoes.

This information should also include: Refrain from running; Refrain from exciting dingoes by waving arms around or entering water; Keep your children calm and close; Do not panic if a dingo approaches; stay calm and still; be attentive to individual dingo characteristics for ID purposes; provide visitors with a safe, enjoyable opportunity to view dingoes in an environment as near as possible to their natural

One improvement would be to educate parents to stay close to their children.

Perhaps legislation could be passed protecting government agencies from litigation, or at least visitors to sign a disclaimer before going to the Island.

The cluster of themes around natural phenomenon referred to food sources and the habitat on which the dingo relies:

We have to consider the wallabies and other animals as well – quails, ground dwelling birds, pheasants – all these prey of dingoes become vulnerable to a higher predator population.

This is a ready and consistent food source derived from humans, which can only prevent the current policy of attempting to have dingoes disassociate humans and food from ever being successful.

With natural-food-sources decreasing, dingoes are still very much going to be looking for opportunistic feeding opportunities.

Dingo health is a major concern ...[we receive]... many pics of emaciated animals.

Dingoes were seen as behaving in a normal or natural way as would any animal living on the Island. Their intrinsic value and rights as dingoes were perceived as critical:

Dingoes are normally inquisitive, notorious thieves and opportunistic scavengers, therefore they will gravitate towards campsites and fishers, not only for any food scraps but also out of curiosity, if visitors act calmly you will have a calm dingo, they are not aggressive by nature.

There's a risk for younger children running near dingoes and specifically around Christmas and over summer - particularly after the tailor-fishing season, which finishes in early November. There's a sudden departure of all the tailor-fishermen and the food they provide.

And: this is the dingoes' home; respect their right to live here in peace.

We understand that tourism is a major industry on the Island and that somehow dingoes and humans need to be able to interact, but not at the cost of the dingoes' lives.

4.4.2 Thematic cluster – reports

This thematic cluster revealed several reports about dingoes that were concerning to participants. Such reports were seen as responses that are overly protective of humans, by over-reacting to dingo behaviours that were not threatening but could result in serious repercussions for dingoes and dingo health:

A dingo pulling a towel off someone's chair and lying on it was reported as a serious incident.

Primarily, participants felt that it was people, not dingoes, whose behaviours were causing dingoes to approach humans and ultimately, to cause dingo death:

The incident reports rarely describe the behaviour of the people involved prior to the incident.

Likewise, we have been told of one incident where a child held out a biscuit for a dingo, then put it in his pocket and ran away.

They know what the fishermen look like, they look for the commercial fishermen, they know exactly what occurs, every time they put a net out.

4.4.3 Thematic cluster – population

This thematic cluster generally reflected the concern of participants about future viability of dingoes as a population but also for other species. Participants in this community of place and identity felt similarly towards the welfare of dingoes:

The review recommended against any supplementary feeding, unless the viability of the dingo population could be scientifically demonstrated to be compromised, without research how are we to determine the health of the population?

But it means watching the wallaby population as well, to stop the native wallaby population from becoming extinct.

So therefore there is an obligation on behalf of the government to maintain the population as naturally environmentally as possible.

Even if evidence suggests that the current level of euthanasia will not impact the population, it hardly supports the policy regarding animal welfare...and this may not be the case anyway as the animals destroyed for aggressive

behaviour are likely to be the bolder and dominate animals, destroying these animals could effectively weaken the gene pool.

4.4.4 Thematic cluster – Fraser Island

Generally this thematic cluster illustrated the value of K'gari-Fraser Island as a World Heritage area. Participant comments reveal the importance of species and ecosystems and having sufficient public funding available to preserve both the conservation and tourism values of the area. The dingo was a critical species in attracting tourists to the Island:

Now a particular species of wallaby at the northern end of Fraser Island is gone.

There's a fire regime on Fraser Island that affects native-prey ...then combined with drought.

We're hoping to ban commercial-net-fishing on Fraser Island as part of the World-Heritage proposal.

Funding for research seems minimal considering Fraser Island is a World Heritage listed island and a major international tourist attraction.

Most tourists who visit Fraser Island wish to have a dingo encounter, or at the very least, see a dingo in the wild.

4.5 Community of interest: rangers

A community of interest is generally defined as one in which members are beneficiaries of the place or contributors to the environmental condition through interest in the resources available, such as business interests. It could be argued that Fraser Island's rangers might also be part of the group 'communities of place' as many live on the Island. Their role as *paid* contributors to communications on the Island, however, has determined their position as having a resource interest in the Island.

Key concepts discussed by this community of interest other than "people" (100%) and "dingo" (57%) were "time" (39%), "numbers" (36%), "different" (32%), and "staff" (25%). The relevance of other concepts is shown in Figure 4.

Seven major themes were identified: people, time, different, dingo, rangers, education and media. These formed the basis of five thematic clusters – communications (includes people, education and rangers), time, different, dingo and media (see Figure 5).

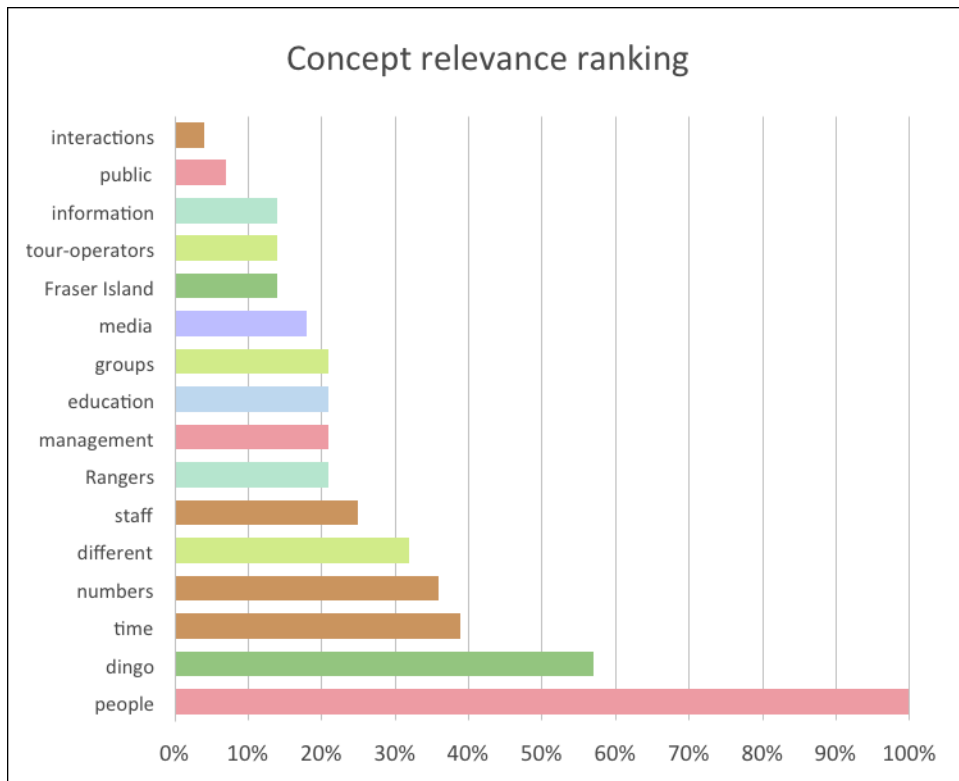


Figure 4: Concept relevance ranking: Communities of interest – rangers.

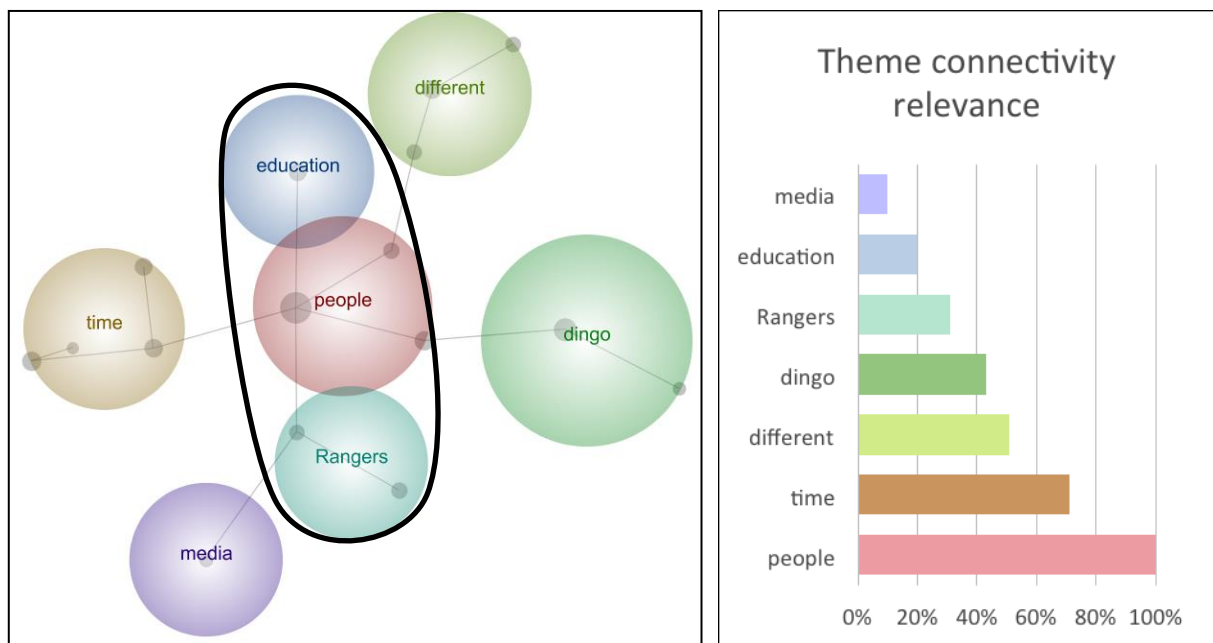


Figure 5: Communities of interest (rangers) – thematic clusters and their constituent themes.

4.5.1 Thematic cluster – communications (includes people, education and rangers)

Communications as a thematic cluster revealed the importance of the formal management plan, as well as informal communication channels, in terms of educating people. Rangers felt their management plan was well-researched, and information communicated 'in-house' appropriately in that new rangers were trained in dingo management. They felt, however, information could be more widely communicated, which was difficult given the diversity of views about dingoes held by the general populace:

I think you know dingo management on Fraser Island is an incredibly well researched, implemented, funded program.

There's a lot of money and time spent on educating campers, people, resort staff, especially based on the higher numbers, higher visitation, breeding time, it's not ad hoc, it's taking all that into account.

We have an educational DVD – for hire groups– on dingo awareness and public camping
Depending on the tour operator that you're talking about there are that many different areas – people that go on the bus, people that hire their own cars, the planes, there's quite a broad spectrum of tour-operators.

There's an induction that's given by our on ground dingo management team to new Rangers.

So dingo management in my opinion, and I think in most people around here's opinion, it's done well, it's just not received well across the general broader community.

[The resort has] a lot of staff and some of them are really good, management really support our program 100 per cent, but communicating that through to the drivers or staff on-the-ground when they've 3 or 100 people with all different views is difficult.

The diversity of perspectives in the broader population led to perceptions and behaviours that were a challenge to rangers. Some of the public held concerns over a perceived decline in numbers of dingoes, but other members of the public either didn't bother to heed rules or actively took positions against rangers due to their hostility toward dingo management:

Yeh, when people hear 'dingoes are going to be gone in two years' that'll grab their attention.

Signage overload – society / people don't read signs.

There are people who want to ban everyone from the Island, except them

People get away with it constantly and undermining the whole management plan that a lot of money and time has been put into.

People are aggressive towards rangers.

I feel – we should have a school-holiday ranger presence for that education.

4.5.2 Thematic cluster – time

The thematic cluster around time included the long-term habituation between people and dingoes, and the constancy of negative public images of rangers destroying dingoes. Rangers had some potential solutions that could be adopted at various times of the day and year.

The direct risk is people interaction causing habituation over time.

The beat-up is that we're shooting them all the time.

I've been in the position for 5 years and in that time four dingoes were shot and the rest were found by people.

[The resort] had the Junior Ranger Program at night time– it's an add-on draw card.

More school holiday- based programs and boost ranger numbers in that period.

A broader, structural challenge to effective dingo-human interaction was the reduction over time of ranger staffing levels:

Basically ranger staff numbers have reduced since back in those days.

4.5.3 Thematic cluster – different

Participants noted different versions of information were presented to visitors but also the varied contexts that may lead visitors to feel a need to approach a dingo, situations that require diverse management:

The original document was quite thick and cumbersome and they prettied this one up a bit with pictures and bits and pieces to make it more attractive but whether it reaches the everyday person is a different matter.

For someone that's just on a bus all day it's different.

4.5.4 Thematic cluster – dingo

The dingo was considered unique and important, but visitor concerns for the dingo or their expectations of an experience with a dingo jeopardised human-dingo interaction and management:

It's the icon of Fraser Island – it's on every bus, pamphlet, brochures, so it's fairly high in that respect.

They automatically got this idea that if we find something out that's bad happened with the dingo then we're going to out to kill it.

I think there's a false expectation that you don't have to do anything to see a dingo.

4.5.5 Thematic cluster – media

Rangers felt that tensions between dingo management and visitor expectations and concerns were pitted against each other by some forms of media that were falsely reporting trends in dingo abundance:

They'll take in what they've heard in the media and what old mate said.

We have to be honest and the media loves to use 'Dingoes will be extinct in two years' time' plastered all across Facebook pages and across newspapers and there's no truth to it at all.

We've had social media telling people don't tell the rangers anything, don't tell them.

The media release provided to [name of newspaper withheld] by us was certainly not used - the information that we gave them ... They used what a member of the public said...

4.6 Community of interest: NGOs and the private sector

Key concepts discussed by this community of interest other than "dingo" (100%), were "people" (89%), "QPWS" (79%), and "messages" (58%). The relevance of other concepts are shown in Figure 6.

Six major themes were identified: key, QPWS, dingo, animal, need people. These formed the basis of three thematic clusters – key (includes dingo, people and need), QPWS and animal (Figure 7).

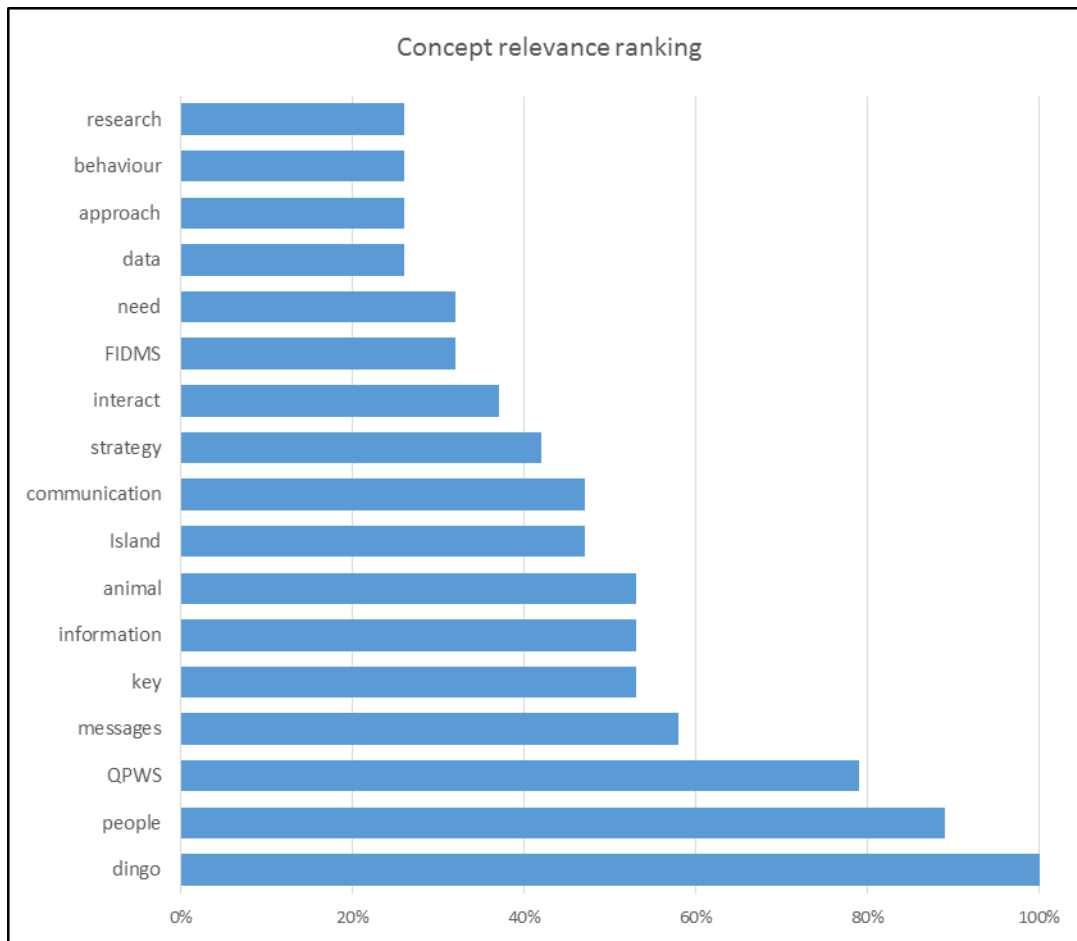


Figure 6: Concept relevance ranking: Communities of Interest – NGOs and the private sector.

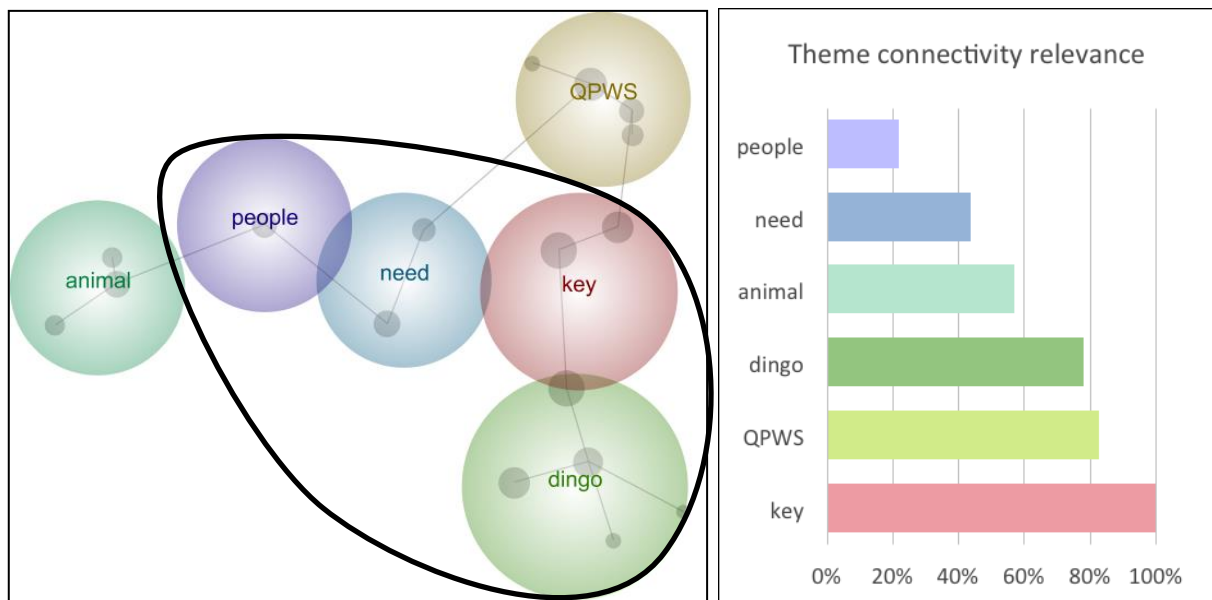


Figure 7: Communities of interest (NGOs and private sector) – thematic clusters and their constituent themes

4.6.1 Thematic cluster – key

This thematic cluster represents key needs for better dingo-human interaction. Much of the information relates to educating tourists, although there was some concern that enforcing humans to act appropriately was harder than communicating the messages:

Ensuring that the tourists access information is a key challenge, as they are often not using local media and language or cultural barriers may prevent them from understanding or responding to information.

How people get onto the Island is really key.

Visitors who are travelling there as independents have to have permits, so that permit-process is one key way to communicate.

Tourism-operators have a lot of information and are a key communication access point.

Develop a dingo cartoon that appeals to children and can be used to share key messages.

What do you do should a dingo choose to interact negatively with you?

Too many messages are a risk.

You have to step back, so a lot people miss that information, but you can't make people read literature.

4.6.2 Thematic cluster – QPWS

Some suggested solutions were that QPWS become more involved in research into visitation and communications, possibly through collaboration with the tourism sector, partly in recognition of the workloads for QPWS staff.

QPWS can step up: gathering information on visitation; data gathering and data keeping and production of research more broadly; innovation and strategy in communication; innovation in signage format that is less temporary and more engaging.

Fraser-Coast-Tourism is linked to council too, so there is room for fruitful collaboration to ascertain exact market and communication mode.

There is a lot of sympathy and empathy for QPWS staff in managing all this.

4.6.3 Thematic cluster – animal

This thematic cluster primarily illustrated the intrinsic value of the dingo to NGOs and the private sector:

I say this is wild animal, it's - leave it alone, respect it.

The industry should be working to reduce expectations, by highlighting that the dingo are a wild animal and with less than 200 on the Island, seeing one is a rare privilege.

I've had to re-educate and say: guys, you're not allowed to interact, you can't interact with these animals.

4.7 Community of interest: scientists

Key concepts discussed by this community of interest other than “dingo” (100%) and “people” (57%) were “need” (48%), “public” (35%), and “FIDMS” (30%). The relevance of other concepts are shown in Figure 8. The sematic points of connectivity are interesting given the scientists held quite different positions (in their research on aspects such as dingo management and sustainability) in their published research.

Six major themes were identified: dingo, need, communication, QPWS, Fraser Island and risk. These formed the basis of two thematic clusters – incidents and risk (includes dingo, need, QPWS and Fraser Island) and communication (Figure 9).

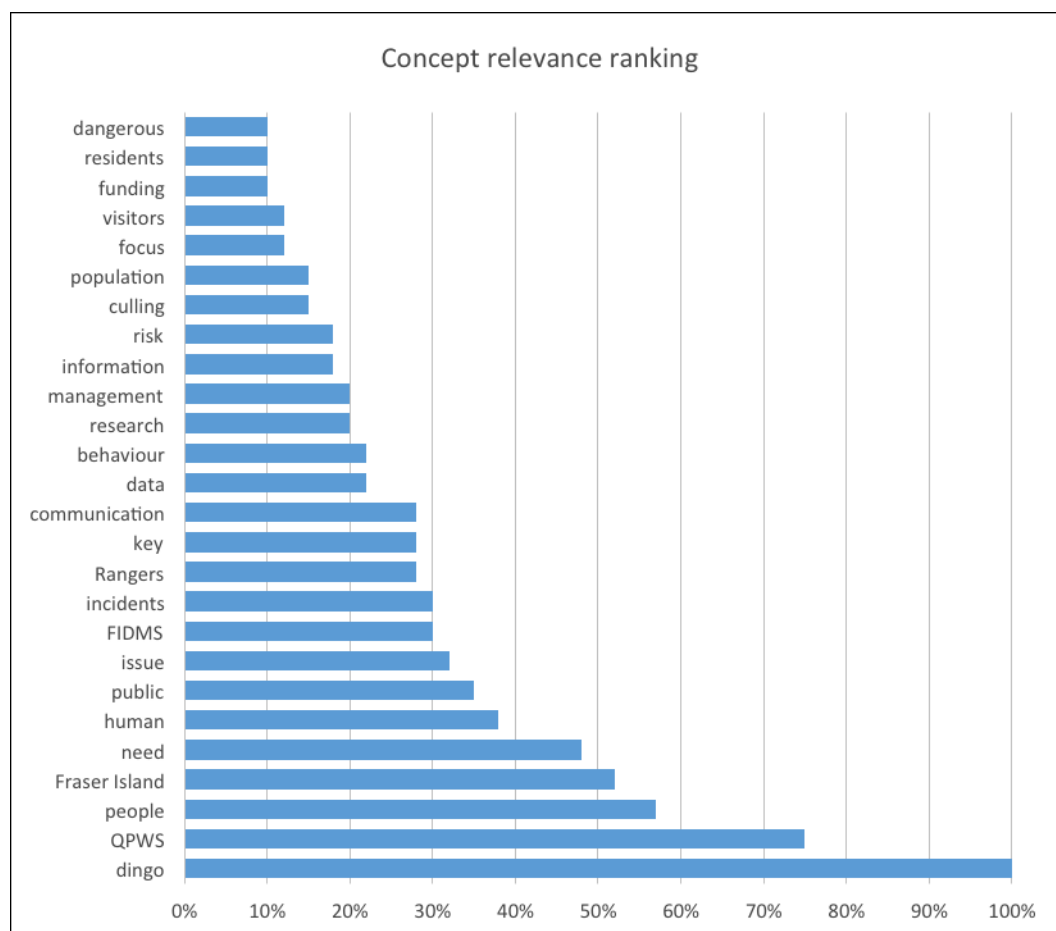


Figure 8: Concept relevance ranking: Communities of interest (scientists)

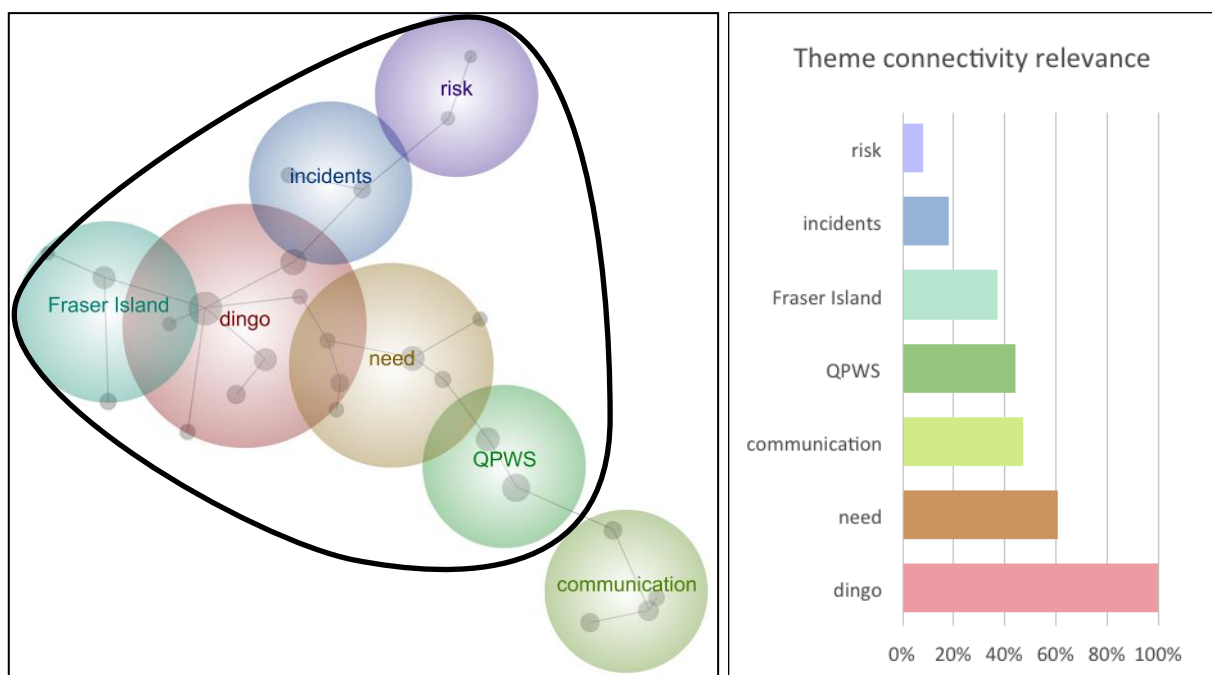


Figure 9: Communities of interest (scientists) – thematic clusters and their constituent themes.

4.7.1 Thematic cluster – incidents and risk

The thematic cluster of incidents and risk was a complex thematic cluster, showing concerns around both risk to dingoes and risk to people, as well as their own organisation. Scientists were concerned that even dingoes who approached humans in non-aggressive ways were at risk:

There are many reasons for this: there are risks to humans related to killing because of the impacts such deaths have on the social structure of the dingo; there are impacts on ecosystem processes; there are harmful impacts on rangers' own well-being.

I understand the risk to children is very high, because they are small and they are noisy and they run, they are the right size, so children are in particular at risk whenever there are dingoes (or even dogs) around.

So while QPWS do a very good job at providing leaflets and information about how to act around dingoes and they have fenced off camp grounds and villages and they have fines, but at the end of the day when you have tourists not supervising children then the dingo is still perceived to be at fault and is punished.

I think QPWS are very worried about that and about being sued and kind of running on paranoia and fear.

If a dingo licks someone's foot, that is classed as a very serious behaviour and if a dingo does that a few times it will be destroyed.

Because we do not have consistent tagging they cannot be sure of a culprit in a serious incident, so would have no choice but to cull.

So how can you even know if the offending dingo is the right one?

Again, scientists felt that humans were to blame for violating appropriate conduct and ultimately causing dingo population and welfare concerns:

I could be quite comfortable relatively close to a pack of dingoes in the desert or the bush, especially in areas with little human occupation.

If there were another child attack or death then I would go on the stand and say this is the parent's fault not the dingo.

Sometimes they say a dingo stole their food.

Sometimes that is a good story to tell, a story to take home to Britain or somewhere like that to share with relatives, a dingo stole my lunchbox or that they heard howling at night.

With adults I am always perplexed when I see something on the media about an adult who has been bitten or scratched by a dingo.

That they have attempted to play, pat, interact, wrestle, whatever with the dingo and there has been a scratch or a bite.

The persecution of the dingo is unjustified and is manifested in ambiguous protection status.

The dingo has become somewhat of a freak-show on Fraser Island.

The amount of times I see a juvenile dingo from the 'doomed' Eurong pack, surrounded by tourist buses and 4wds as it tries to go about its business on the beach, is sickening.

My feeling about most incidents that have occurred on Fraser Island with adults is that person has instigated the issue.

The overpopulation of tourists on Fraser Island is the problem, not the dingoes themselves.

Scientists also provided some recommendations including a need for specific dingo expertise (particularly with the absence of sufficient funds for QPWS to conduct research),

managing the public who visit (and act inappropriately on) the Island but also managing diverse social values:

You have rangers on Fraser Island that have all sorts of training backgrounds, from broad ecology to wildlife management and can tend to think if they have looked at a dingo they are a dingo expert.

I think we need to stop all culling until we understand much better the ecology, the population dynamics the level of inbreeding and all that kind of thing.

The identification system QPWS use are not effective.

This does have a cost, as you would need much more patrols.

Remove the funding and remove those rangers, so I think the lack of enforcement is an issue.

I would just repeat all the points about focusing on human education and to stop culling and intervening with the dingo.

And definitely drop the A-E incident codes.

Looking, also, at the incident reports around human-dingo incidents a lot of those animals-dingoes are juveniles and I think getting those animals-dingoes through the teenage stage when they are most bold and most willing to explore and disperse is important.

People should go to these [other] sorts of islands if they want to party, and if they want to go to a world-heritage-listed national-park experience then go to Fraser.

The biggest issue QPWS have are the residents and dingo-advocates who are passionate about protecting dingoes at all costs.

Could work well to have people met by rangers as they come off barges.

People like having positive interactions with rangers; it is part of the Fraser Island experience and would improve their profile.

4.7.2 Thematic cluster – communication

The second thematic cluster around communication illustrated the potential for a negative public image of the managers, particularly in the absence of sufficient funds and staff for rangers to conduct core business of managing the Island, but there were also concerns that communication with the public posed risks to the dingo:

Staff are not allowed to enter into communication with media or public.

If QPWS had firmer data then they could communicate what are doing well better to the public.

They are scared of tagging because the public doesn't like that.

As I said, the effort should go to educating the public.

if the QLD-Government is serious about addressing the strategic objectives of the FIDMS, then this needs to be backed up with commensurate amounts of funding.

Another thing I can comment on is the requiring the public to identify dingoes in order to manage them when this just means killing.

It is very problematic to conclusively identify a dingo - relying on public weakens an already weak justification.

There is a presumption in much of the FIDMS of a link between feeding and human habituation and then danger.

4.8 Summary of semantic mapping

There is a very strong message common to all stakeholder groups that humans are the problem with dingo-human interactions, and particularly visitors who may have unrealistic expectations or behaviours. All groups of people in the research felt that information and communication could be improved, whether this be the communication channels that were used, the information contained in the messages, the effectiveness of those messages, or the need to bridge diverse social values.

There are also some interesting differences in values. Rangers and scientists had concerns over managing risk and reputation. Rangers felt some media outlets were spreading false information or heightening visitor expectations, which were increasingly difficult to counteract with reduced staffing and resourcing in QPWS. Scientists were also concerned over the risk to the institution by some media outlets, as well as the risks to humans, particularly children, and risk to the dingoes, especially non-aggressive dingoes. They felt there was insufficient funds for communication and education.

In contrast, Butchulla people, residents and others with a personal connection to the Island, and NGOs and the private sector held strong values about the rights of the dingo. Butchulla people were keen to promote their long association with dingoes and the importance of the dingo to their culture and the landscape, to ensure more rubbish removal and education, and to recognise the diversity of people and dingoes. Residents and those with a personal connection felt that humans need to be dissuaded from expecting dingo associations and educated about food and dingo behaviour, whilst suggesting the incident reports contain messages about what the humans were doing rather than blame the dingo. In particular, dingo and other species welfare needs to be taken into account. NGOs and the private sector noted that visitors were often from different countries so education needs to take

account of cross-cultural communication needs, with information at the source of departure and arrival, strategies for behaving when a dingo approaches, succinct information, child-specific messages, and more research disseminated about visitor numbers and communications in collaboration with the tourist industry. None of these differences are necessarily mutually exclusive, rather, they represent key messages of each group at the time of the research and taken together, tend to reinforce the key commonalities that humans, rather than dingoes, need managing through more effective and broader communication.

5 Commentary and analysis of survey respondents

This section of the report will provide commentary on the outcomes of the survey respondents. The commentary is divided into discussion on the demographic makeup of the respondents and the form and nature of their stay on the Island. The report will then turn to the indicators of environmental values and discourses held by respondents at the time of the research before exploring the forms of communication used by respondents and assessment of usefulness of various media. It will then explore respondent knowledge of the dingo and issues around safety, including respondents' perceptions of: human safety, dingo welfare, how dangerous dingoes are, best human behaviour in dingo encounters and human foods and dingo diet. Respondents presented diverse values in relation to dingoes and this is juxtaposed with consideration of respondent understanding of management and legislation relating to the K'gari-Fraser Island Dingo. The qualitative respondents are also reviewed. Then this section of the report draws this tertiary analysis out into a patterned analysis via numerical taxonomy, particularly in relation to the various social assemblages that can be read as meaningful patterns in the data. Social assemblages in this context can be defined as participants grouped by patterns and connections in their responses to do with their environmental values, sources of communication and demography.

These sections are ordered in this way to demonstrate the way in which respondents encountered survey questions. The commentary is founded in environmental discourses to convey the significance in values and social assemblages in influencing all other factors to do with the minutia of dingo communication and understanding of QPWS messages.

A total of 158 people completed the survey; 24 completed the survey online and 134 completed paper-based surveys on K'gari-Fraser Island. The paper-based surveys were collected during site visits in September 2015 and February 2016. People were surveyed in camp grounds and visitor areas including Eurong, various dune-based camp sites on the eastern beaches, Eli creek, and the Maheno wreck. Surveys were conducted inland around Lake McKenzie, Central Station and other visitor walks and information points as well as on the ferry from Hervey Bay and at King Fisher Resort.

5.1 Demographics

The majority of respondents were from Australia (74), with 10 from Britain, 7 from Germany, 2 from France, 2 from Sweden and one each from America, Canada, South Korea and the Czech Republic. A further 59 respondents did not provide information about their nationality. However, 20 per cent of respondents indicated that they live in another country (see Figure 10). 30 per cent of respondents live in a regional town in Queensland, 23 per cent live in a city outside of Queensland, 16 per cent live in Brisbane. Only 11 respondents live in rural areas (7 in Qld), and 5 respondents live on K'gari-Fraser Island.

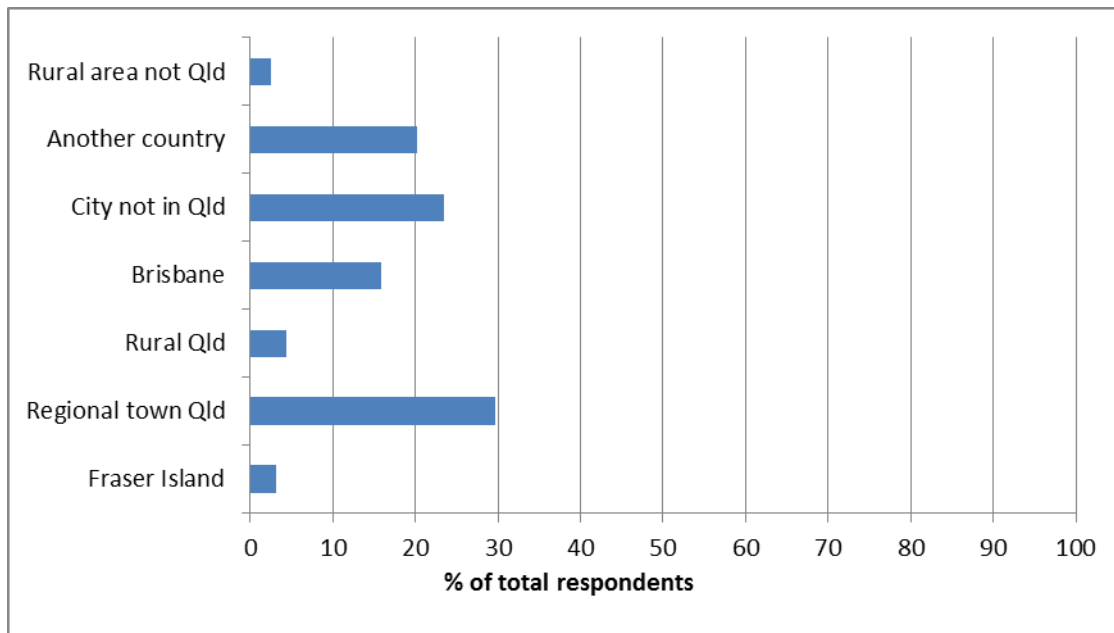


Figure 10: Respondent's place of residence.

5.1.1 Main reason for being on K'gari-Fraser Island

The most common reason for being on K'gari-Fraser Island was for a self-drive tourist experience (for 28% of respondents); with 24 per cent of respondents camping and a further 7 per cent were on a 'tag-along' tour (see Figure 11). 10 per cent of those surveyed went to K'gari-Fraser Island for fishing, 6 per cent for walking and 4 per cent for boating. 8 per cent of people were on tour buses, mostly small tour buses. This percentage may be affected by the fact that in the field, people on tour buses were unwilling to participate in the survey due to time restraints. A further 5% of people noted they were there on holiday / to relax in a resort or hotel. Other respondents were on the Island in a work capacity (2% tour business; 2% hospitality; 2% business operator and there was one QPWS officer). In the field, tourism operators were also unwilling to participate in the survey due to concerns over employer permission. There were also 5 respondents from the environmental / NGO sector, and 4 researchers. 9 respondents indicated they were there as residents, and one respondent identified as a traditional owner. Four respondents were on K'gari-Fraser Island for family events (hen's party, wedding or honeymoon).

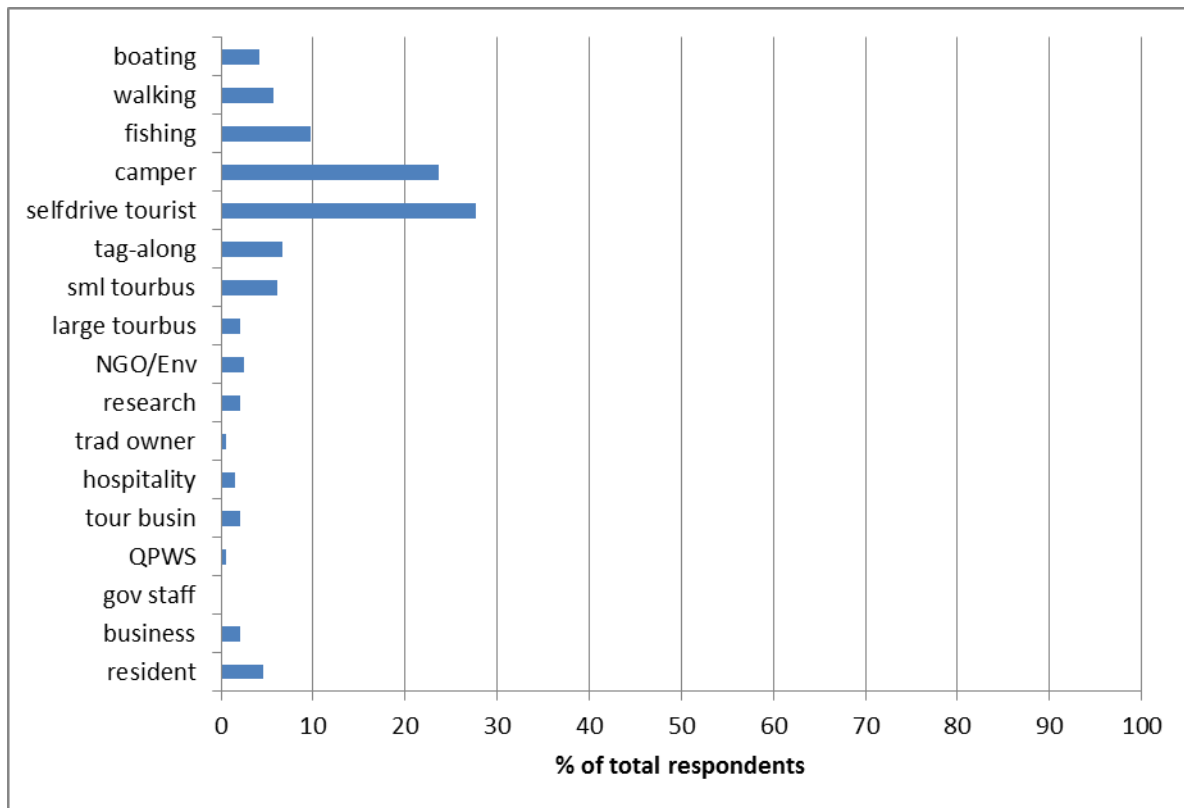


Figure 11: Main reasons for being on K'gari-Fraser Island.

5.1.2 Accommodation and length of stay

The large majority of respondents (88%) were staying overnight on Fraser Island. Half of these were staying from 1-3 days; 32 per cent were staying between 3 and 7 days, 13 per cent staying 7-14 days and 6 per cent staying longer than 2 weeks. Of those overnighiting, half were camping, 27 per cent were staying in hotel or resort accommodation, 14 per cent were staying in private residences, 7 per cent in cabins, and 2 per cent in hostel accommodation.

5.2 Environmental discourses

In Question 1 of the survey, respondents were asked to rank, in order of importance from 1-3, statements related to environmental discourse. The six statements relate to knowledge, values and beliefs about K'gari-Fraser Island, see Table 2.

Table 2: Question 1: - how respondents value the environment of K'gari-Fraser Island.

| Fraser Island is a place where..... | |
|--|---|
| Choose only 3 categories ranking the most important as 1, second most important as 2 and the third most important as 3 | |
| A | People can use the environment for their recreation needs |
| B | The environment is managed for conservation with advice from scientists and experts |

| | |
|-------|--|
| C | The environment is under pressure from people |
| D | The needs of future generations for engagement with nature are considered sustainably |
| E | The needs of the natural environment are considered within the limitations of the planet |
| F | The forces of nature show that people can only exist as an integral part of nature |
| Other | |

The statement that was checked by the highest number of respondents (107) was: “Fraser Island is a place where the needs of future generations for engagement with nature are considered sustainably”, followed closely the statement: “Fraser Island is a place where the environment is managed for conservation with advice from scientists and experts” (see Figure 12). The statement that was least checked by respondents was: “Fraser Island is a place where the needs of the natural environment are considered within the limitations of the planet”.

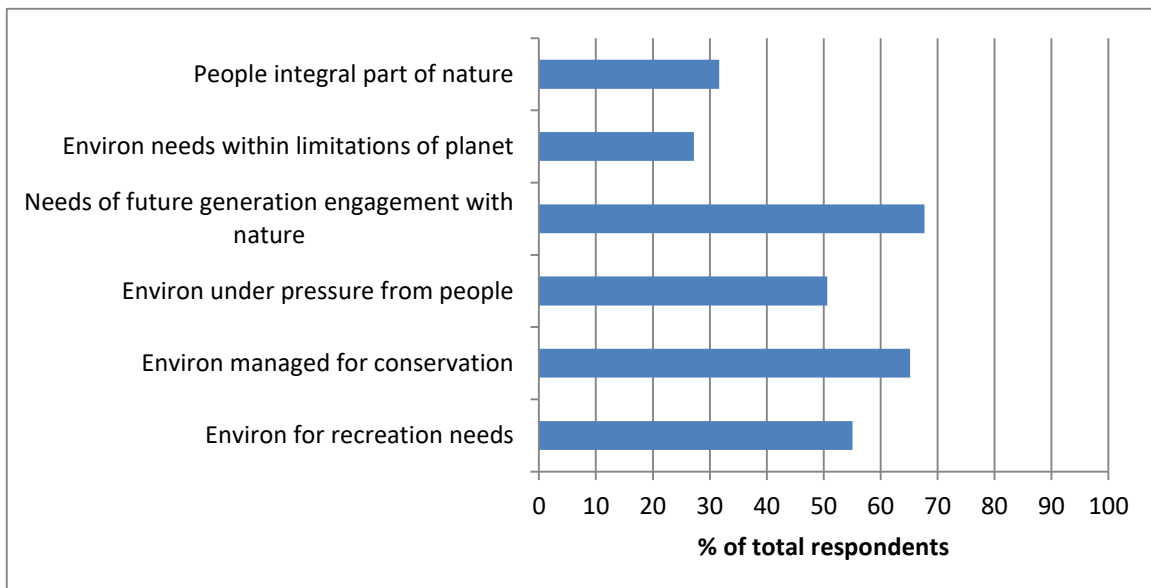


Figure 12: Environmental statement most referred to by respondents (environmental discourse).

Respondents ranked these statements about knowledge, value and beliefs about K’gari-Fraser Island in level of importance (see Figure 13). While 26.5 per cent of respondents believed that, most importantly, on K’gari-Fraser Island the environment is managed for conservation with advice from scientists and experts, and 29 per cent believed as moderately important that the Island is under pressure from people, most respondents felt all the statements were important.

However, some respondents (7.5%) made mistakes in filling out this question in the survey, such as only checking one statement, or not ranking them, or ranking all of them. Some participants expressed that they did not fully understand the statements.

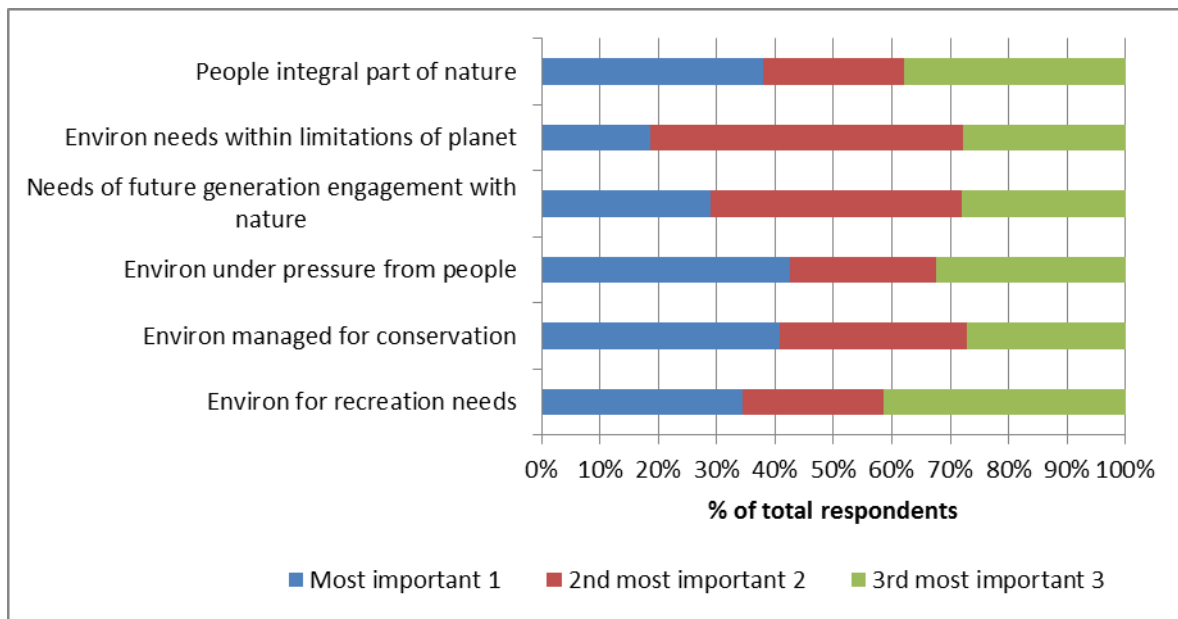


Figure 13: Level of importance of environmental statements.

5.2.1 Environmental responsibility

In Question 2 of the survey, respondents were asked to rank, in order of importance from 1-3, who they considered responsible for solving environmental problems on K’gari-Fraser Island. Again some respondents (6%) made mistakes in filling out this survey question.

The majority of respondents (59%) considered the QPWS as most responsible for solving environmental problems on K’gari-Fraser Island, followed by government agencies and the Queensland Government. Relatively few considered the business / commercial sector, universities, or non-government organisations as responsible for solving environmental problems (see Figure 14).

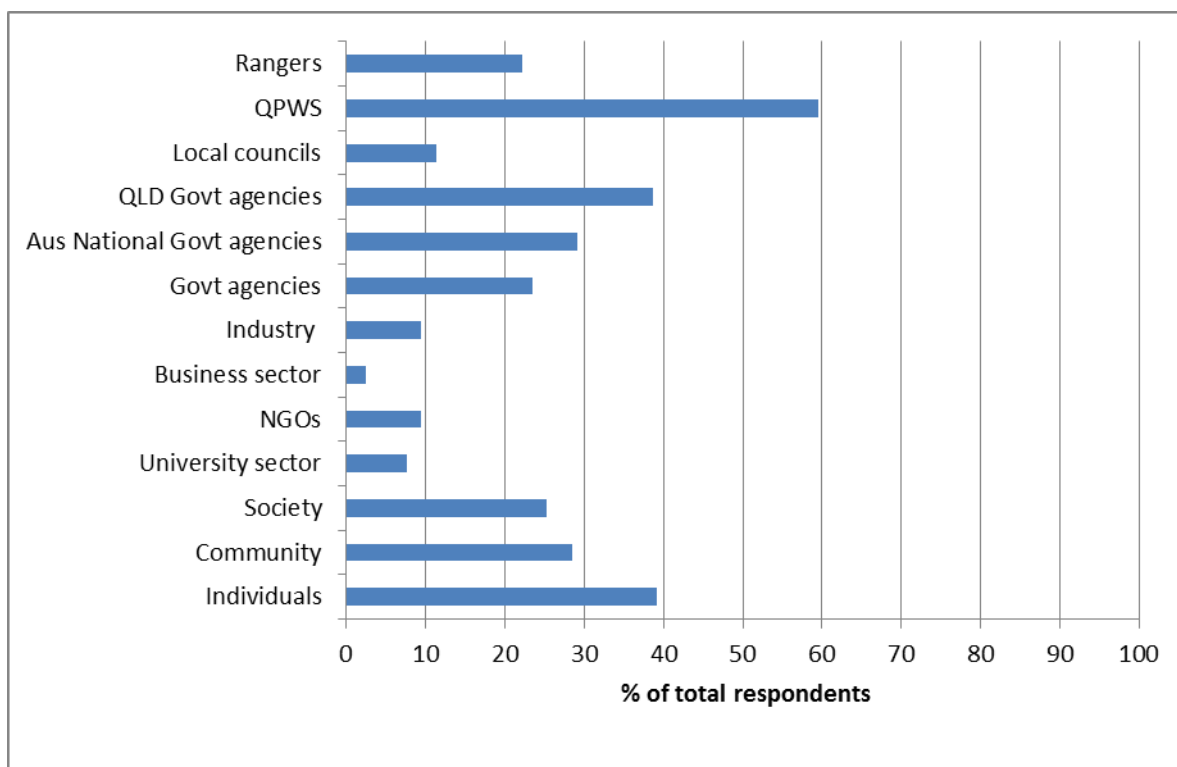


Figure 14: Entities considered responsible for environmental problem solving.

Respondents ranked these entities in order of importance from 1-3. Ultimately, 21 per cent of respondents considered the individual as most important in being responsible for the environment on K'gari-Fraser Island, followed by 18 per cent of respondents who considered QPWS as most important in solving environmental issues (see Figure 15).

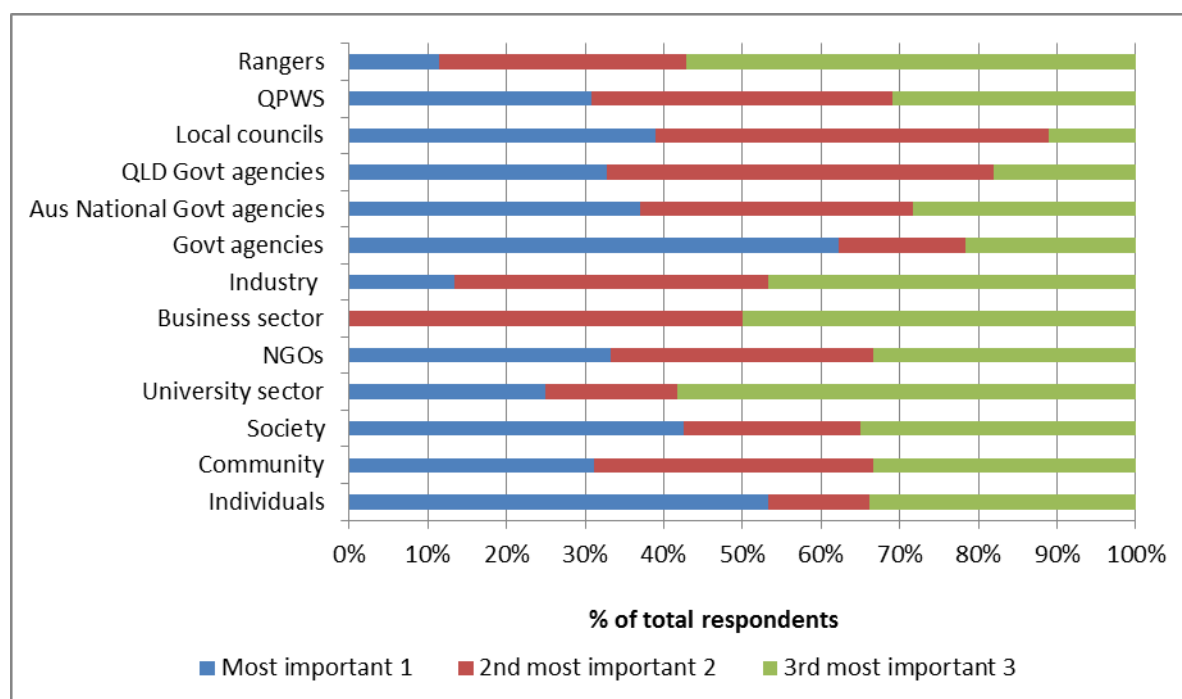


Figure 15: Entity responsible for environment in level of importance.

5.3 Source of information about K’gari-Fraser Island and its usefulness

The survey asked respondents to indicate where they got their information about Fraser Island and to rate its usefulness. Most respondents (78%) obtained information about Fraser Island before they visited the Island. The main source of information for most respondents was online websites (63%), followed by signage on the Island (59%), national parks’ information centre / noticeboard (54%), the QPWS (59%) and friends or family (54% - see Figure 16). Half of the respondents received information and brochures in their Fraser Island permit packs. 58 per cent of respondents read the information before arrival on Fraser Island.

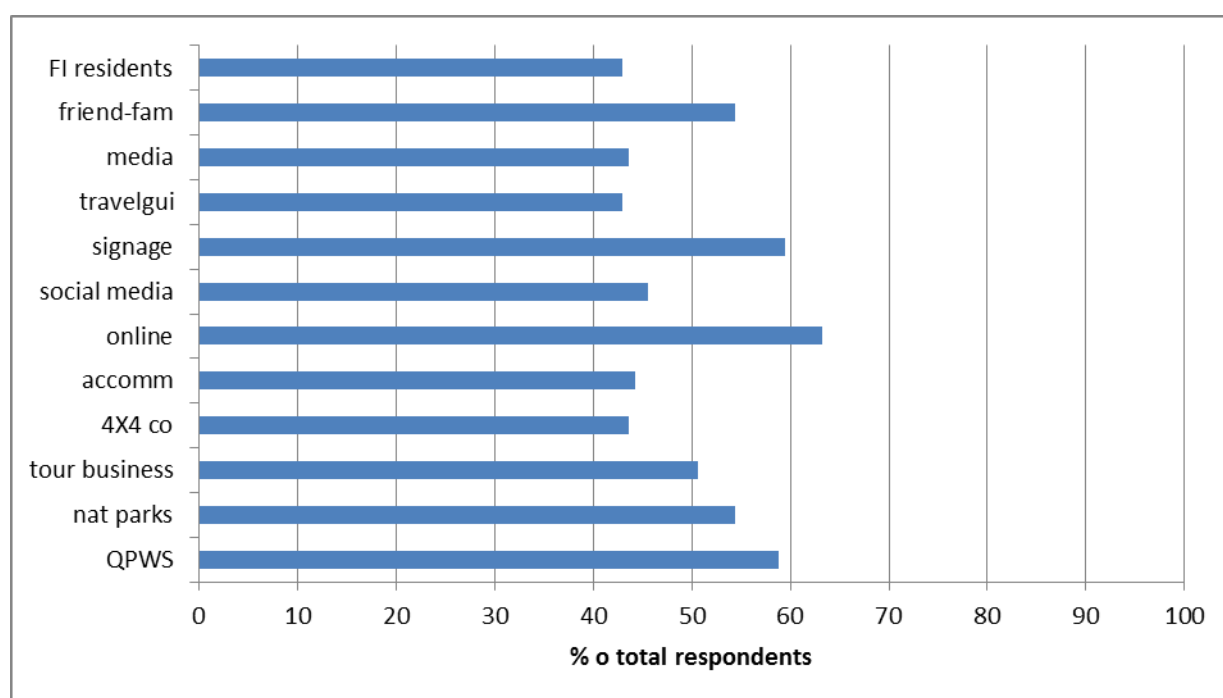


Figure 16: Source of K’gari-Fraser Island information

Significant numbers of respondents also sourced information about K’gari-Fraser Island from four-wheel drive companies (51%), K’gari-Fraser Island residents (43%) and the media (44%). However, 36 – 44 per cent of those respondents who received information from these sources rated the information as ‘not useful’ (see Figure 17).

Information that was most considered ‘useful’ to ‘very useful’ was that sourced from online websites, signage on the Island and QPWS / national parks (see Figure 17). A further six respondents listed K’gari-Fraser Island dingo conservation groups (SFID, FIDO and FINIA) as sources of information and rated these sources as ‘very useful’.

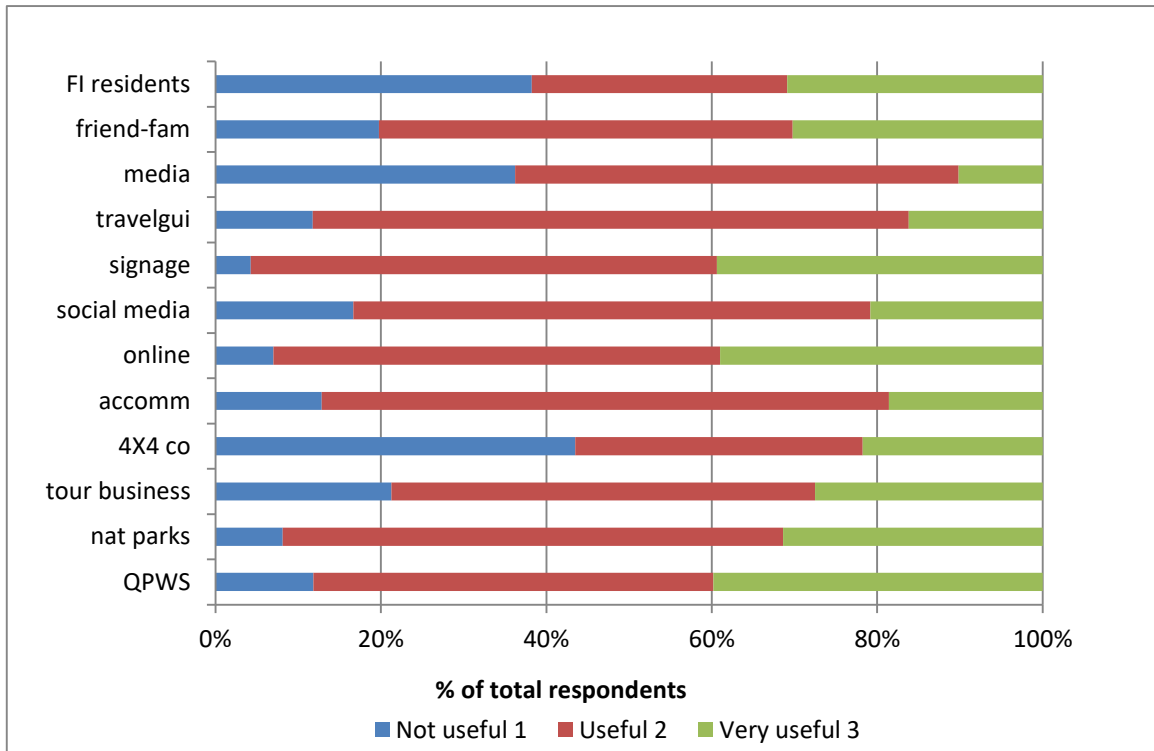


Figure 17: Usefulness of K'gari-Fraser Island information

5.3.1 Most important media sources of information

The survey asked respondents what they considered the most important media sources of information and communication about K'gari-Fraser Island. and to rank them from 1-3 in order of importance. The majority of respondents (76%) ranked tourism websites as the most important media sources of information about K'gari-Fraser Island, followed by government websites (54%) and environmental organisation websites (42% -see Figure 18).¹³

¹³ 10% of respondents made errors in filling out this survey question (such as ticking and not ranking or only ticking or ranking one source).

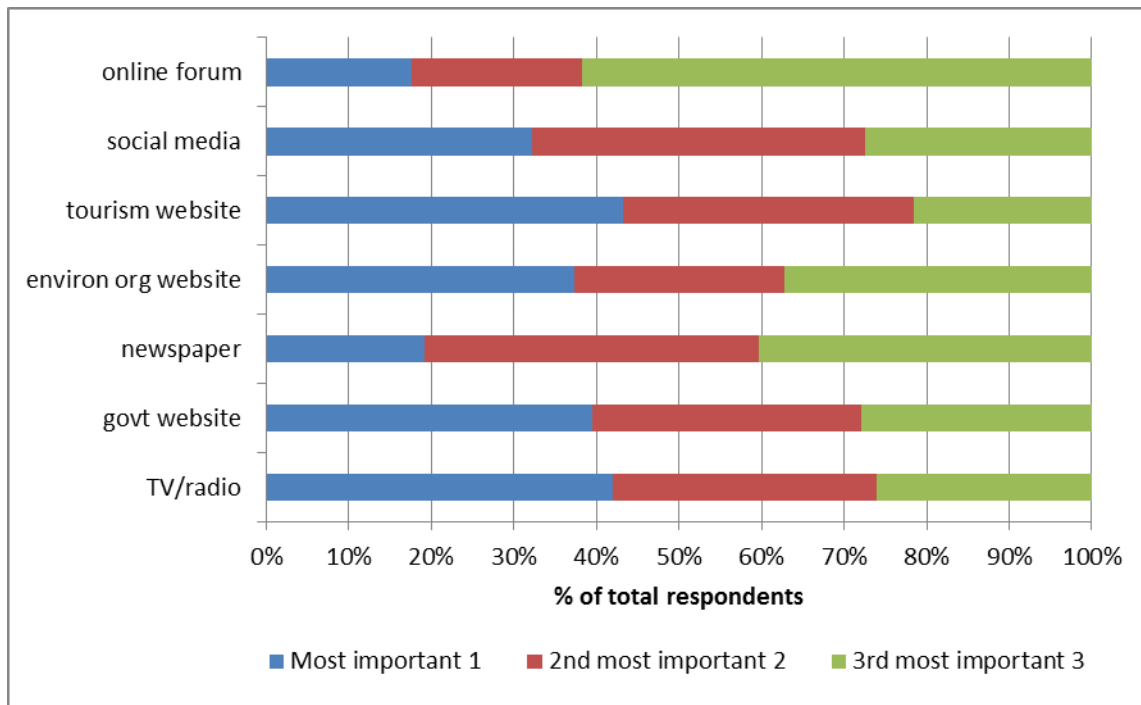


Figure 18: Ranked importance of media sources.

5.3.2 Most important non-media sources of information

When asked to consider the most important media sources of information and communication about K’gari-Fraser Island, respondents indicated overall that friends (61%), rangers (38%) and the Queensland Government (38%) were the most important non-media sources of information (see Figure 19Error! Reference source not found.). When ranked from 1- 3 in order of importance, the ‘friends’ category was the information source of most importance (33%), followed by family (17%) and rangers (16%).

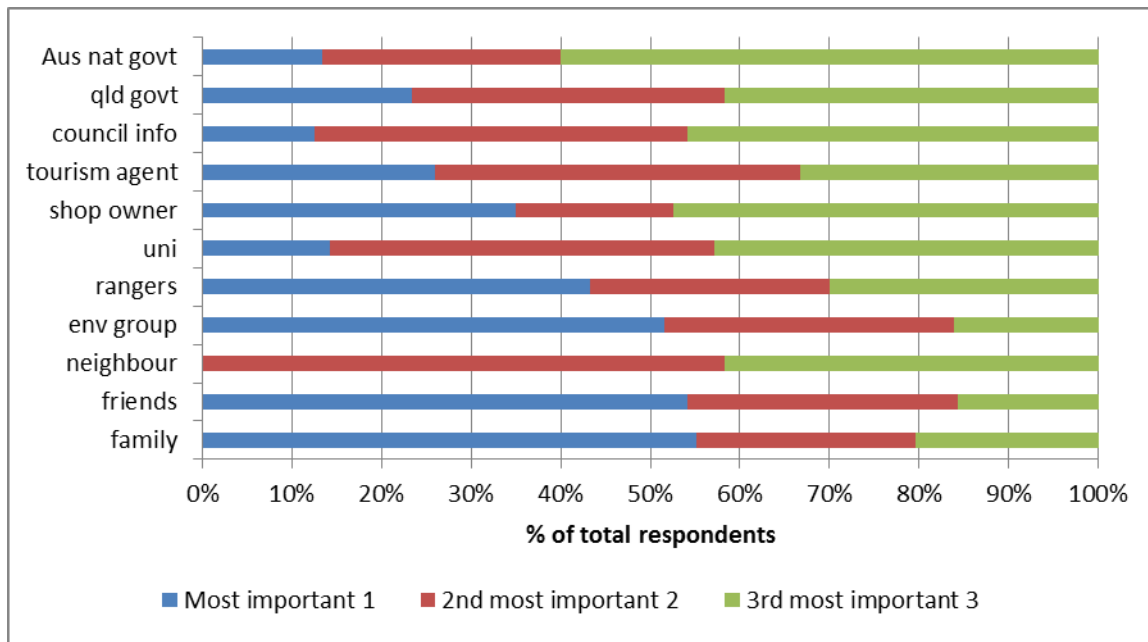


Figure 19: Ranked importance of non-media sources of K'gari-Fraser Island information.

5.4 Knowledge of Fraser Island dingoes and safety

Most survey respondents (89%) expect to encounter dingoes on K'gari-Fraser Island. The survey questioned respondents about their perceptions of dingo danger and safety. In response to the question on what level of risk respondents were willing take in dingo encounters, only one participant indicated they would either feed a dingo, or play with a dingo (see Figure 20). Another 14 per cent indicated they would 'get close enough to get a good photo'. The large majority (77%) of respondents were only willing to observe from a safe distance. Some (8%) would also chase a dingo away if need be.

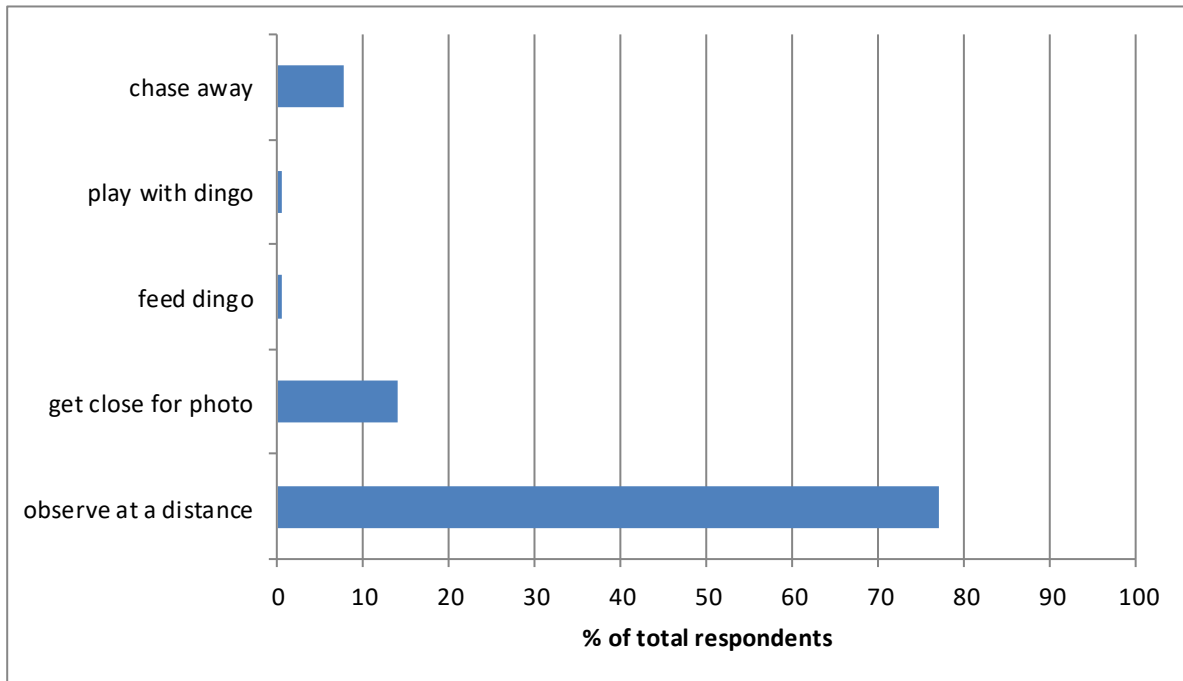


Figure 20: Level of risk willing to take with a dingo.

11 per cent of respondents perceived dingoes not to be dangerous, while the majority (69%) perceived them to be ‘a little dangerous’ to ‘dangerous’, and 20 per cent saw them as ‘very’ to ‘extremely dangerous’ (see Figure 21).

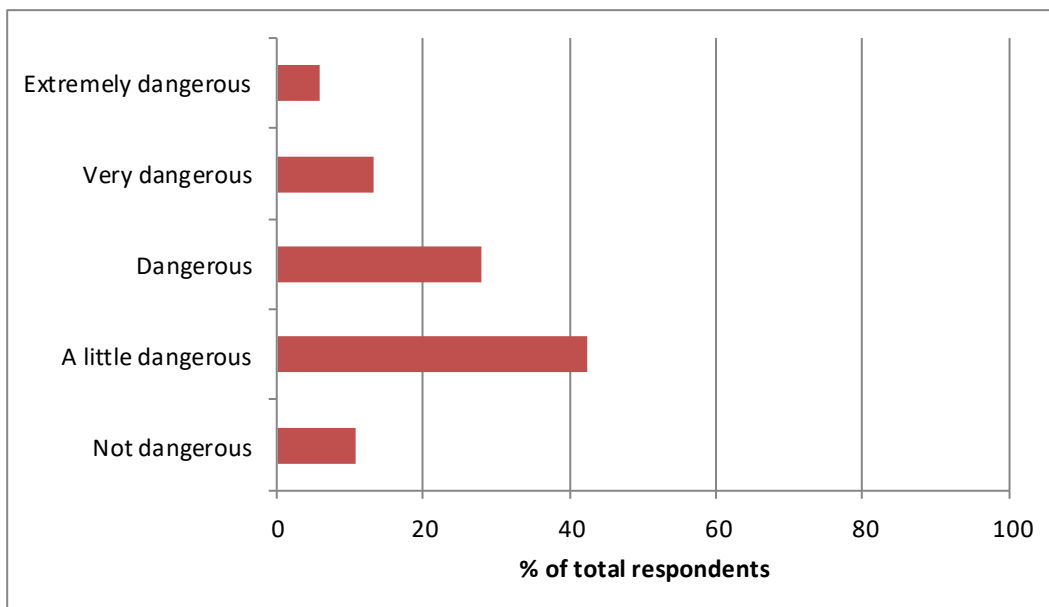


Figure 21: Perception of levels of danger that dingoes pose.

5.4.1 Concerns for people safety

There seemed to be a distinction between perception of danger and concern for personal safety with respondents evaluating the dingo with varying rates of dangerousness. Most respondents (75%) indicated that they were not concerned for their personal safety. Of this 75 per cent (118 respondents), 53 people explained why they were not concerned about dingoes and safety. The main reason provided was that as long as guidelines on *dingo-safety* were followed, they would be safe from dingoes. Another six respondents indicated island management and fencing as ameliorating personal safety concerns.

Of the other respondents expressing concerns about safety, 18 were concerned about their young children in particular. Another seven were concerned about the potential danger and unpredictable nature of dingoes, four worried about habituation in particular and people not understanding the dangers posed by interacting with dingoes. Two respondents believed that the lack of natural food sources for dingoes makes them scavenge from people and then become dangerous.

5.4.2 Concerns for dingo welfare

The majority (58%) of respondents indicated they had concerns for dingo welfare. Of these respondents, four did not explain why they had concerns. The main concern for 38 respondents, who did explain their concern, was a perception that irresponsible human acts may cause dingo habituation, which can lead to dingo aggression and ultimately lethal management. A further 21 respondents expressed concerns about the environmental impact on the dingoes, and the loss of habitat leading to dingo extinction. People were also concerned with the potential impact that the loss of dingoes could have on the ecosystem. Dingo extinction was also a concern for 15 respondents who believed that dingoes are becoming extinct due to them being destroyed or eradicated. Another 10 respondents were concerned there was not enough food for dingoes or that dingoes are starving. Excessive numbers of tourists and traffic on the Island was a concern for 14 respondents, who felt it would impact detrimentally on dingo habitat and dingo lives.

Of the 42 per cent of respondents, who did not indicate concerns for dingo welfare, 8 explained they believed that dingoes were well managed on K'gari-Fraser Island, still seemed to be abundant and most people follow *dingo-safety* guidelines. One stated they were not informed enough to comment and the other 54 respondents not concerned for dingo welfare declined to explain why not.

5.4.3 Previous dingo encounters

A majority of respondents (58%) reported having previously encountered a dingo or dingoes on K'gari-Fraser Island. The total number of dingo encounters reported in responses was 423. Of these 423 encounters, 18% (78 encounters) occurred on the eastern beaches of K'gari-Fraser Island, 13% occurred 'in the bush', 8% each were on a track and near fishing, and 6% each near ferry landings and at or near campsites.

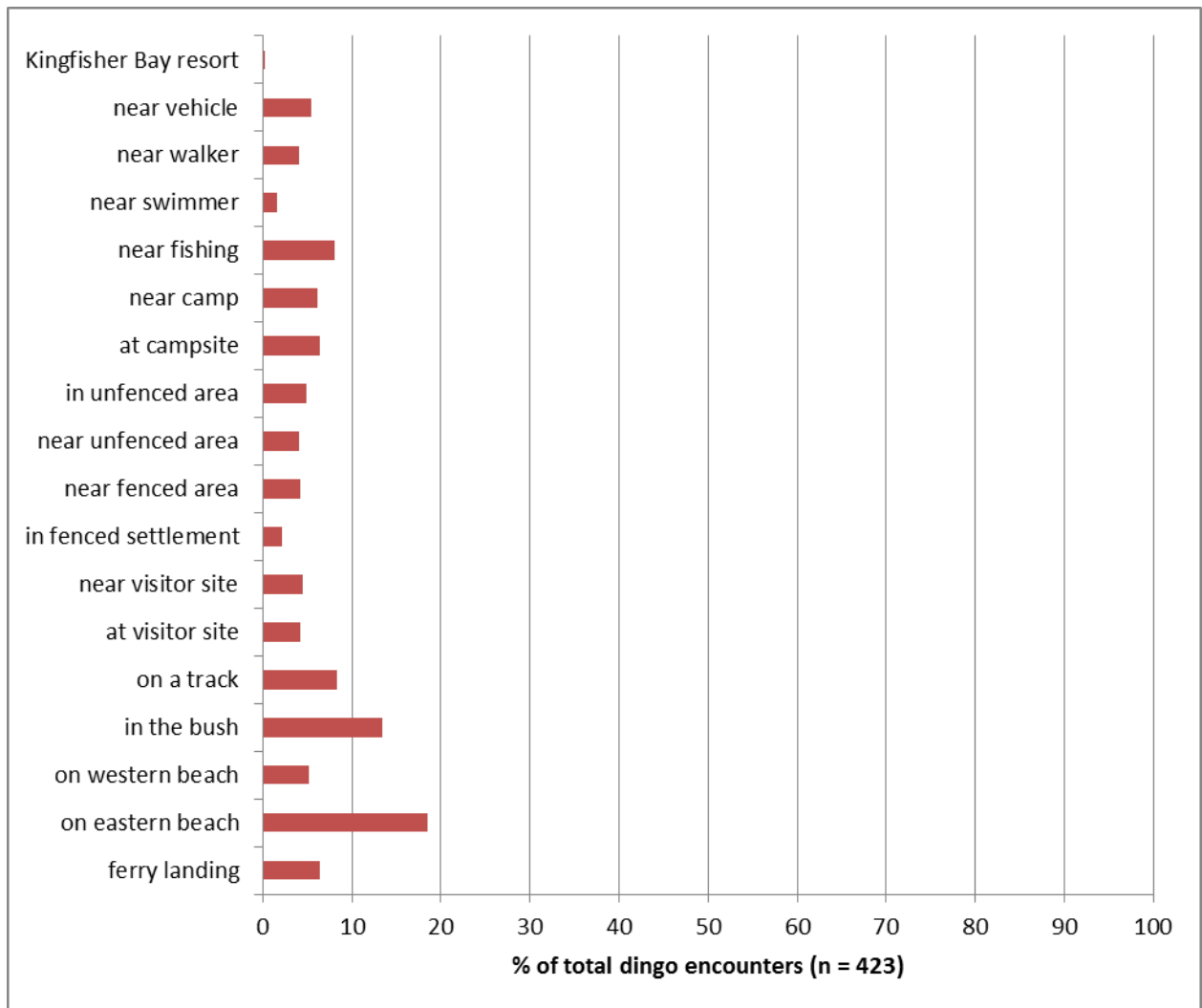


Figure 22: Previous dingo encounters.

5.4.4 Advice on how to behave around dingoes

The survey asked respondents to select from sources listed where they had accessed advice on how to behave around dingoes and how useful that advice was. Again, most respondents accessed *dingo-safe* advice from QPWS, national parks and signage on the Island (see Figure 23).

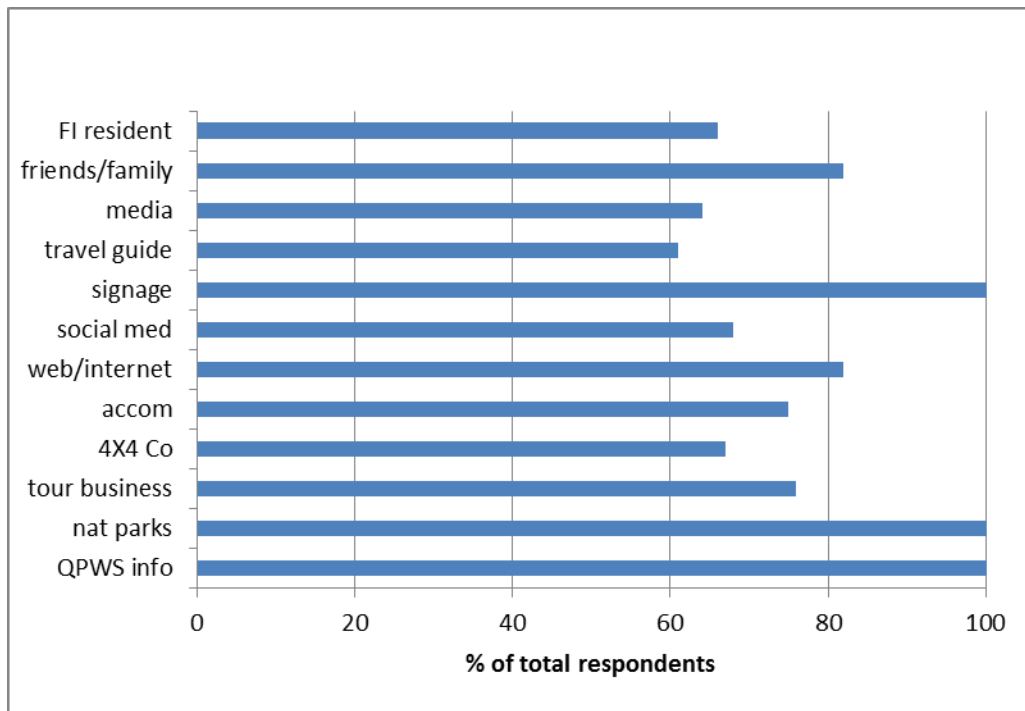


Figure 23: Source of advice on behaviour around dingoes.

The most useful *dingo-safe* advice for respondents came from QPWS and signage (see Figure 24). There were mixed responses about the advice from K’gari-Fraser Island residents. While two thirds of the 66 respondents who had received information from residents viewed it as ‘useful’ to ‘very useful’, one third (22 people or 14% of total respondents) found it ‘not useful’.

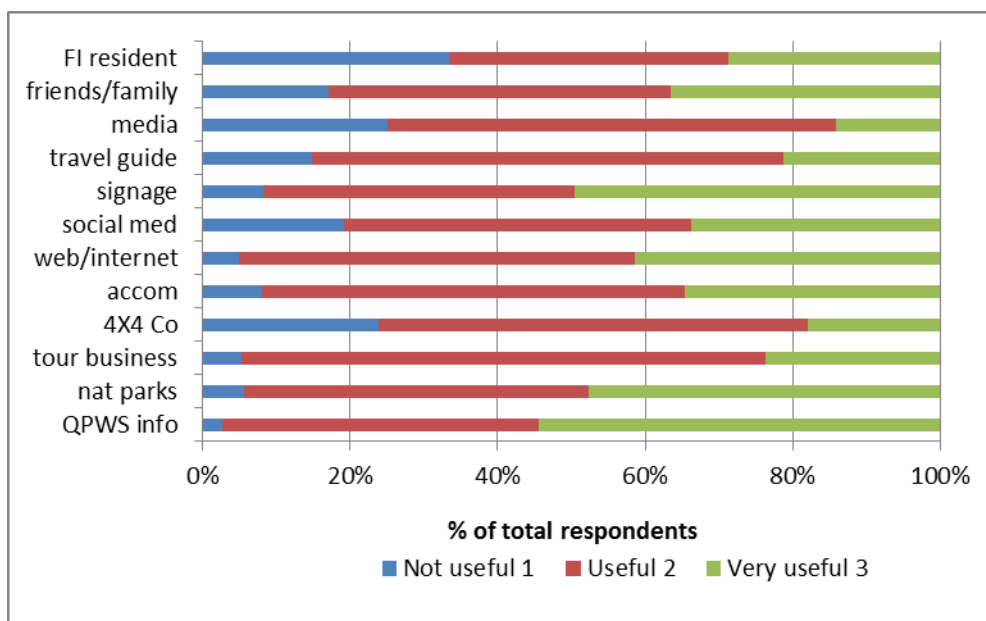


Figure 24: Usefulness of dingo-safe advice.

5.4.5 Perceptions, knowledge and beliefs about dingoes

Question 16 of the survey presented a true / false Likert Scale corresponding with statements related to dingoes on K’gari-Fraser Island. The statements are divided into categories reflecting respondents’ perceptions about safety around dingoes; perceptions about food and dingoes; values about dingoes; and knowledge of management and legislation in relation to dingoes. Overall, most respondents were well informed about how to behave around dingoes and of dingo eating habits.

5.4.6 Perceptions about safety around dingoes

The majority of respondents (83%) believed ‘dingoes are dangerous’, with 45 per cent indicating this statement to be ‘definitely true’ and 38 per cent indicating it to be ‘probably true’ (see figure 25)

However, while a lower percentage (65%) believed dingoes are wild and cannot be tamed, 91 per cent of respondents did not perceive dingoes to be ‘like pet dogs’. Approximately half of the respondents indicated they did not yet know enough about dingo behaviour, but the large majority (84%) perceived themselves equipped to know enough to tell their children (or group members) how to behave if they encountered a dingo on K’gari-Fraser Island. Most respondents overwhelmingly believed it not ‘ok’ to get close to a dingo for the sake of a photo (92%), that it is safer to stay in groups (88%) and to keep all children close on K’gari-Fraser Island (71%). However, 27 per cent of respondents were unsure as to whether ‘dingoes can herd people into the sea’ and the remainder were evenly divided as to whether they believed that statement or not. Information confirming this statement is published in the Queensland Government brochure, *The Dingoes of Fraser Island (K’gari) Safety and Information Guide*.

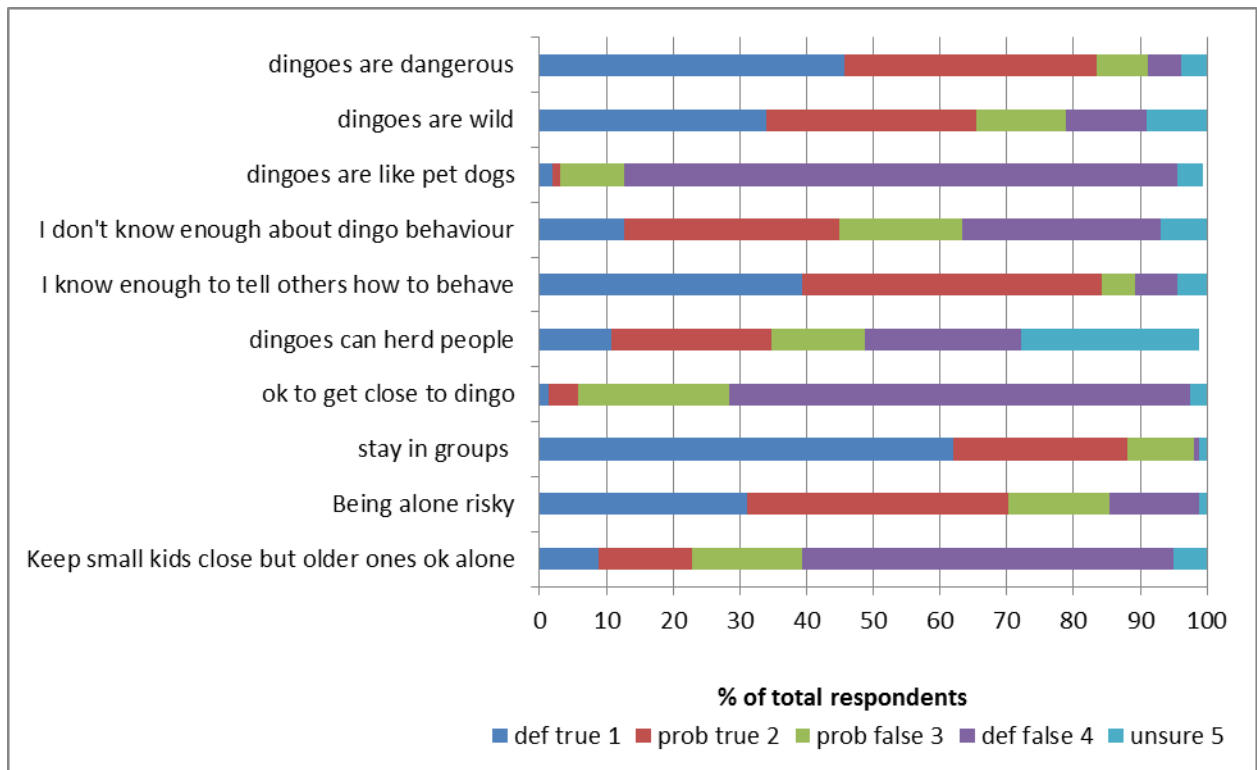


Figure 25: Perceptions about safety around dingoes.

5.4.7 Perceptions about food and dingoes

A quarter of people surveyed perceived as ‘probably true’ that ‘dingoes that look thin are likely to be hungry’, and 3 per cent believed this to be ‘definitely true’ (see Figure 26). While 8 per cent of respondents were unsure about thinness being a sign of hunger, the majority (64%) did not believe it to be so. This correlates with 94 per cent of respondents believing that dingoes hunt for natural food, and thus do not rely on humans for food. Additionally, most respondents were aware that they should not be feeding dingoes, as 75 per cent of them did not agree with the statement: ‘You shouldn’t feed dingoes fruit or bread but meat products are ok’. Nevertheless, 15 per cent of respondents do not believe they can be fined for feeding dingoes and a further 10 per cent do not believe they can be fined for leaving food or rubbish lying around.

The large majority of respondents are aware of the need to store food carefully and had discussed the issue with their group, but about a third of them were unaware of the provision of food lockers on the Island.

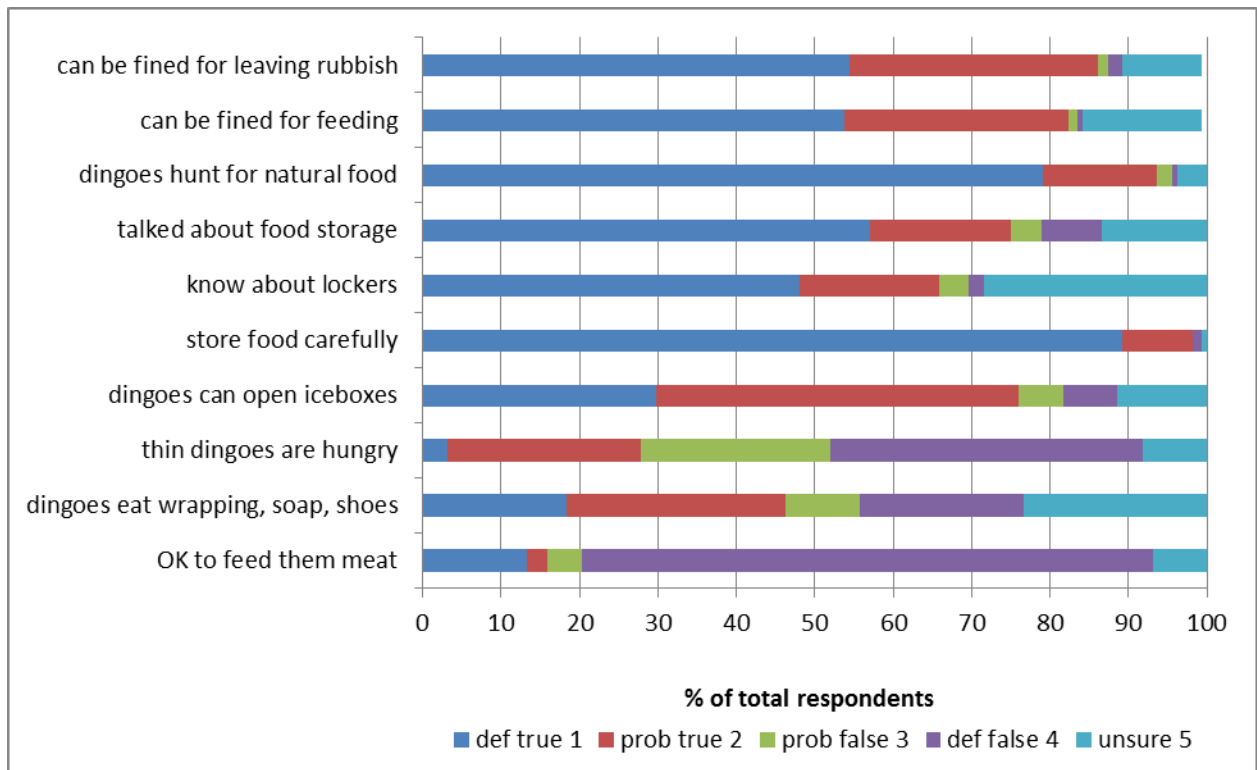


Figure 26: Perceptions about food and dingoes.

5.5 Values about dingoes

Most people surveyed (92%) believed dingoes belong as ‘symbols of wild Australia (and should be protected)’, with 80% of respondents viewing dingoes as ‘part of the tourist experience’ on K’gari-Fraser Island (see Figure 27). Most (80-88%) believed that dingoes have a role in the ecosystem, are not pests, and are not a threat to the environment. A quarter of respondents believed dingoes belong as domestic companions in Indigenous communities, while 35 per cent were unsure about that.

The majority (56%) believed all K’gari-Fraser Island dingoes to be ‘pure’ (20% were unsure), and 44 per cent believed there are also pure dingoes on the mainland, but a third of respondents were unsure of this. People were divided about whether K’gari-Fraser Island dingoes are more important than mainland dingoes with 36 per cent believing they are, 47 per cent believing they are not more important and 18 per cent unsure. Of those surveyed, 42 per cent believed, to an extent, that K’gari-Fraser Island dingoes are nearly extinct (13% were definite), and 27 per cent were not sure that was the case. Only 13 per cent of respondents were definite that K’gari-Fraser Island dingoes are not nearly extinct.

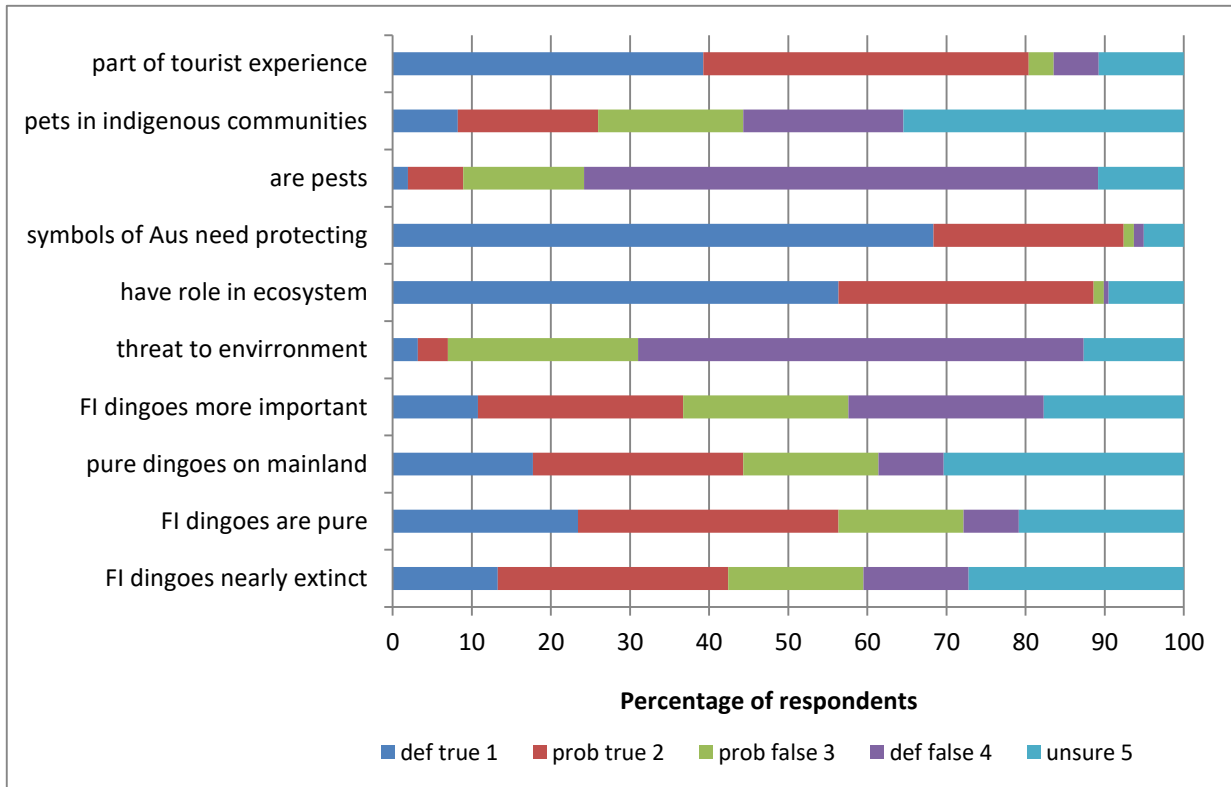


Figure 27: Values and beliefs about dingoes.

5.5.1 Knowledge of management and legislation

Most respondents (90%) believed dingoes were likely to be protected by legislation in protected areas (such as national parks); 65 per cent definitely believed this to be so (see Figure 28). The majority (56%) also believed dingoes were likely to be protected by legislation outside areas such as national parks, while 20 per cent were unsure of this and 13 per cent definitely disagreed.

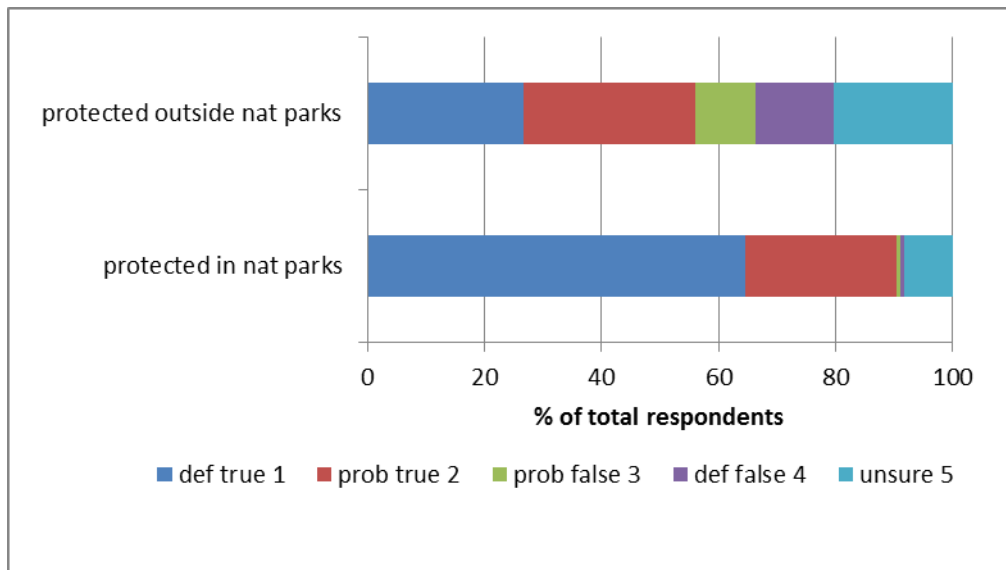


Figure 28: Knowledge of management and legislation.

5.6 Qualitative end comments from respondents

At the end of the survey people were asked to provide any relevant comments or suggestions. Six respondents expressed disappointment at the lack of dingo sightings; five respondents were concerned about carrying capacity of visitors and development on the Island. Twelve comments called for people and management to respect and protect the dingoes on K'gari-Fraser Island. Two respondents expressed concern about lack of food sources, and two expressed concerns about survival of the dingoes as a result of 'mismanagement':

Mismanagement has seen the numbers dwindling and present sightings show starving skinny dingoes. **Unnecessary ear tags ... gross cruelty ...** during the collaring process... **more indigenous being employed** to work and advise visitors about behaviour. **More Rangers** need be employed ...greater respect needs to develop. **The Island needs a Care Centre for injured wildlife.** ..Most wildlife transported off the Island die in transit.

Nine respondents provided suggestions for *dingo-safety* which included:

- There needs to be some penalties e.g. expulsion from the land immediately for severe breaching of local laws
- Security cameras and scanners
- Perhaps a more inclusive approach would improve the life of a dingo
- Stop tourists from meddling; disciplinary action for those that do; full immunity for the dingo
- Island needs a care centre for wildlife
- Unnecessary ear tags

- More indigenous being employed
- More rangers
- More research is required regarding the health of the animals, population and genetic viability

Other comments related to effective management: 3 commented on how safe the fences made them feel, and two indicated that signage was effective ('great for kids to understand') and more 'would be good'.

While summarising the total percentage of responses to individual survey questions provides significant insights into explicit positions on specific questions about communications and values, it is essentially the relationships between these responses that give an insight into communications that are pitched to address specific populations of visitors and communities of interest and identity on K'gari-Fraser Island. In order to identify these relationships a numerical taxonomy was conducted to identify and test the statistical reliability of these relationships.

5.7 Numerical taxonomy methodology and figure interpretation

Demonstrating difference and clarifying relationships that drives much research is often performed on a sub-conscious level and is likely to be subjective (Sarantakos 1993; Belbin 1993a). This report applies a multivariate approach using both standard descriptive statistics (as in the summary graphs showing results of individual survey questions reported in the first section of this survey reporting) as well as numerical taxonomy which comprises cluster analysis, multi-dimensional scaling ordination and network analysis. This provides a means of considering with equal importance, several related and random variables simultaneously (Manly 1994). Standard analysis approaches that combine methods such as Principal Components Analysis, Factor Analysis, Discriminant Function Analysis and Cluster Analysis have been further developed through computer-based approaches that provide a more statistically reliable outcome. This approach avoids hierarchical approaches and compounded errors thus exposing structure in social value-frames more effectively by assessing simultaneously relationships between cases (survey participants) and variables (survey questions and categories) to portray relationships of people with values through clustering, ordination, networks and statistical evaluation (Wardell-Johnson 2005). This process-based validation emphasises characterization of sets of cases (individuals clustered into social assemblages) rather than variables as causes. Identifying affinities between cases (clustered as social assemblages) and variables (clustered as value-frames), and testing the strength of these affinities, provides a means of portraying the cases in abstract ordination space identifying values and socio-demographic descriptors held in common. The results are then statistically evaluated for significance and only a cut-off stress level of 0.2 represents a tested and accurate result (Wardell-Johnson 2005).

This analysis approach using the PATN package (Belbin 2002) did not require a normal distribution of data, and was not dependent on *a priori* decisions about the importance of specific variables (dependent and independent variables) in defining the clusters, ordination or networks. The value-frameworks were portrayed by the co-ordinates of cases (participants) with variables (survey questions) in a matrix within abstract dimensional space (Wardell-Johnson 2005).

Dissimilarity between cases based on variables associated with each of the three social dimensions was quantified using the Gower metric (forming social assemblages) using UPGMA (unweighted pair group arithmetic averaging) with Beta set at -0.1 (Belbin 1991). Groups of variables (value clusters shown in the column dendrograms) were derived using the Two-step metric (Belbin *et al.* 1984) also with Beta set at -0.1. The association between case (social assemblages) and variable groups (attribute clusters) and extrinsic variables (the socio-demographic variables and sources of information for numerical taxonomy analysis research question 1) were compared using Kruskal-Wallis tests which is a non-parametric equivalent of the f-ratio based on average rank of each attribute (Belbin, 1993b). The results are depicted as ordinations showing the number of social assemblages (groups) that have sufficient similarity in response to be represented in association.

The results of the numerical taxonomy portray the analysis results in a range of visual forms. Ordination (multi-dimensional scaling) shows the diversity in the survey participants (through the data) without excluding 'outliers' (Wardell-Johnson 2005). This insight is based on minimal assumptions in the weighting of cases and variables, exposing the pattern and structure that underpins social-landscape relationships (Wardell-Johnson 2005). The patterns of both cases (participants grouped into social assemblages) and variables (attribute clusters grouped into value-frames) that result from a single analysis are analysed and portrayed here through four visual formats: ordinations that include the network of participants (minimum spanning trees) and multi-dimensional scaling ordinations with the significant drivers (ordination vectors)(see Figure 29); row (survey participants) and column (survey question and categories) dendrograms (see Figure 30); and a two-way table (see Figure 31 **Error! Reference source not found.**) that shows the relationship between survey respondents and survey questions (Wardell-Johnson 2005).

Figure shows the ordination, where each dot represents one survey respondent and colours represent clusters of survey respondents with common values named here as social assemblages. The second figure shows the overlaid statistically critical biplot vectors (also) that indicate statistically critical tensions within the social assemblages. Each biplot vector shows direction of correlation with ordination axes (positive association with individuals and social assemblages). Positive association is in the direction of the biplot label and emanates from the centre of the ordination space. Negative association of the variable with the individuals and social assemblages is in the opposite direction from the biplot vector label across ordination space. The neutral zone is in the centre of the ordination space (Figure).

Row and column dendrograms portray visually the statistical clustering of cases (survey participants) and variables (survey questions and categories). The fourth visual form is a minimum spanning tree showing the network of relationships between individuals (each dot) (Figure) and social assemblages (defined by colour).

The objective of applying numerical taxonomy to this analysis was to establish relationships. These results show answers to the question: Is there a relationship between the values people hold in relation to dingoes, and their sources of, and perceptions of usefulness of information on dingoes?

The analysis of people (survey responses 158) in relation to their values, experiences, expectations and socio-demographic descriptions resulted in seven different groups (social assemblages) (table 3) (Figure). The largest social assemblage was number 6 with 42.4% of total responses, and the smallest was SA 3 with only one individual. The four smallest SAs (sub-assemblages) were described in one group due to commonalities in their responses.

Table 3: Percentage of total survey responses in each social assemblage.

| Social Assemblage | Number | % |
|--|---------------|----------|
| <i>Sub-assemblages 1, 2, 3 and 7</i> | 21 | 13.3 |
| <i>SA 4</i> | 45 | 28.5 |
| <i>SA 5</i> | 25 | 15.8 |
| <i>SA 6</i> | 67 | 42.4 |
| <i>Total valid survey participants</i> | 158 | 100 |

The environmental discourse of each survey participant was identified through a series of ranked statements. Table 4 shows the short variable names used in the survey and in the summary of survey question results, as well as in the results of the numerical taxonomy.

Table 4: Environmental discourse categories and associated survey statements.

| Environmental Discourse Category | Environmental Discourse Short Variable Name in multivariate analysis | Survey statement | Survey Variable Name |
|---|---|---|-----------------------------|
| Rational Environmentalist | RtnlEnvtlst | People can use the environment for their recreation needs | Env-Rec need |
| Technical Problem Solver | TchPrblmSlvr | The environment is managed for conservation with advice from scientists and experts | Env-Cons |

| | | | |
|-------------------------------------|-------------|--|-------------------|
| Environmental Survivalist | EnvSrvvlst | The environment is under pressure from people | EnvPplePrssr |
| Environmental Sustainability | EnvSstnblty | The needs of future generations for engagement with nature are considered sustainably | EnvPpleNatre |
| Green Rationalist | GreenRtnlst | The needs of the natural environment are considered within the limitations of the planet | EnvLimitNatre |
| Green Romantic | GreenRmntc | The forces of nature show that people can only exist as an integral part of nature | EnvIntgNatrePpl e |

The relationships between survey participants was analysed and resulted in seven social assemblages statistically differentiated (Figure). The variables (statistically differentiated) characterising these social assemblages include differences in the way information is sourced and valued.

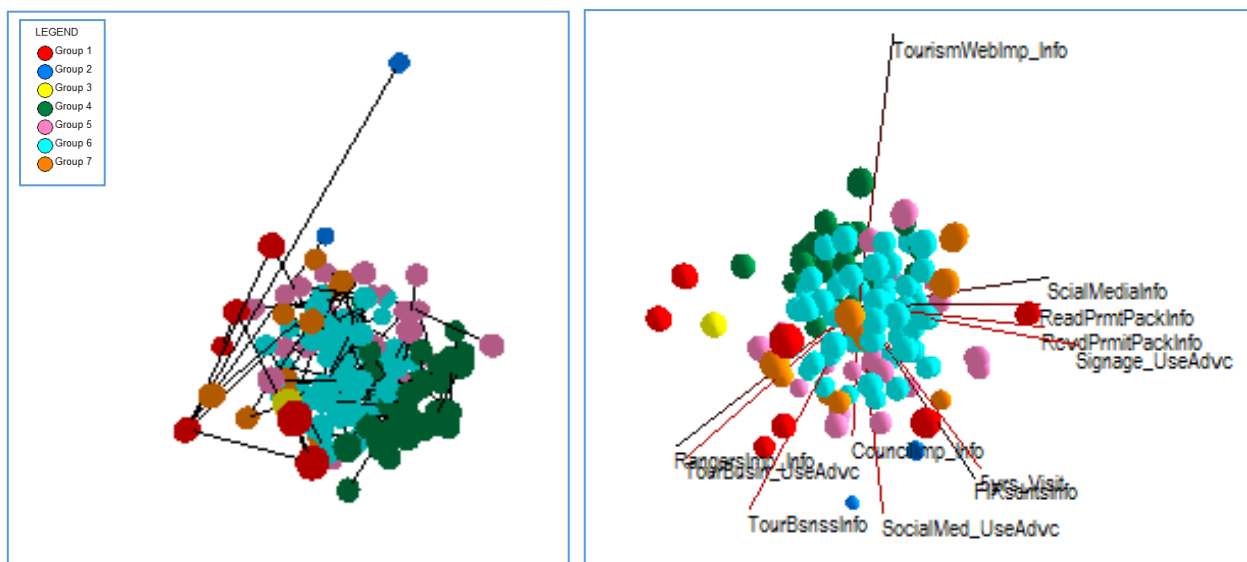


Figure 29: Ordination showing 7 value-frames (social assemblages) for sources of information and value of that information (stress in 3 dimensions at 0.21).

Reading the biplot vectors (Figure) shows evidence that those who have accessed information from tourism websites (TourismWebImp_Info) are statistically different from those who have rated social media advice as useful (SocialMed_UseAdvc). People who have visited KFI over at least five years (5yrs_Visit) have also accessed information from other KFI residents (FIRsdntsInfo). People who have received permit pack information (RcvdPrmtPackInfo) have also read this information (ReadPrmtPackInfo), and have found signage on dingoes useful (Signage_UseAdvc). This group appears to be dichotomously differentiated from those who have rated information from rangers as important

(RangersImp_Info), and information from tourism businesses (TourBsnessInfo). Those who have received information from tourism businesses also rate that information as useful (TrsmBusin_UseAdv).

This ordination showing biplot vectors provides an immediate insight into significant differences in the use of and value of information to visitors and residents on the Island. This provides a useful starting point to differentiating communications strategies to target different value frames and different visitor sectors.

5.7.1 Descriptions of social assemblages

Social Assemblage 4 (28.5% of total responses), outlining distinctive characteristics in comparison to other social assemblages:

- KFI dingoes are not purest dingoes but neither are mainland dingoes pure genetically. Dingoes don't serve an ecological role; don't hold symbolic value; don't need protection in the park; don't need protection outside of the park; are not important for tourism; aren't wild animals; aren't dangerous. This group does not have high expectations of seeing dingoes on KFI.
- For penalties: not indicate a knowledge of fines for feeding; not indicate that leaving rubbish out is a problem; don't use lockers and haven't discussed storage of food; don't rate safety knowledge highly.

5.7.2 Social Assemblage 5 (15.8% of total responses) characteristics:

- Dingoes are not wild, and not a safety risk, but there is a concern for their welfare. Previous encounters with dingoes are on western side of the Island and often in association with settlements.
- Higher levels of Environmental Survivalist discourse (The environment is under pressure from people) and low levels of Green Rational (The needs of the natural environment are considered within the limitations of the planet) and Green Romantic (The forces of nature show that people can only exist as an integral part of nature) discourses. Dingoes have a distinct role in the ecological environment, are protected in the park and have symbolic value. This group has encountered dingoes previously in a range of settings and are more likely to have stayed in a cabin or in a private residence.
- Some awareness of safety: walking in groups (but this didn't correlate with not walking alone as a measure of safety); not necessarily observe from a distance;
- Awareness of interaction with dingoes includes: storage of food.

5.7.3 Social Assemblage 6 (42.4% of total responses) characteristics:

- Dingoes have a role in the ecological environment, are protected in the park and have symbolic value. This group has not encountered many dingoes previously and expect to see dingoes on KFI.
- Strong safety awareness in particular areas of safety, but not a strong sense that they know enough about safety: walking in groups (but this didn't correlate with not walking alone as a measure of safety); have the highest of all SAs of perception that dingoes are an issue for safety; observation from a distance.
- Awareness of interactions with dingoes includes: food storage.
- Dingoes are not necessarily a particular value as a tourist experience, and are not considered to be like pet dogs and must hunt for their food. It would not be OK to feed them meat.
- This group appears to have had some experience of dingoes eating shoes, and opening iceboxes.

5.7.4 Sub-Social Assemblages, 1, 2, 3, 7 (13.3% of total responses) characteristics:

- These sub-assemblages are characterised by their numerous sightings in diverse locations of dingoes previously. These experiences with dingoes appear to have included incidents of 'shoe-eating' and 'ice-box opening'.

The column fusion dendrogram shows the way in which values are ordinated. Descriptions of value-frames are outlined in the figure text. Interpretation of this would indicate first that information provided to short-term visitors from tourism businesses is applied and valued. This group is likely to include tag-along tours, possibly international origin self-drive campers and similar visitors. There are a significant group of people that are not as aware of safety messages, which are likely to be those visiting the Island for fishing and likely domestic self-drive campers. This group also appears to have had the most number of encounters with dingoes. This group has also not nominated QPWS and rangers as specifically responsible for management and information indicating a gap in possible communications strategies.

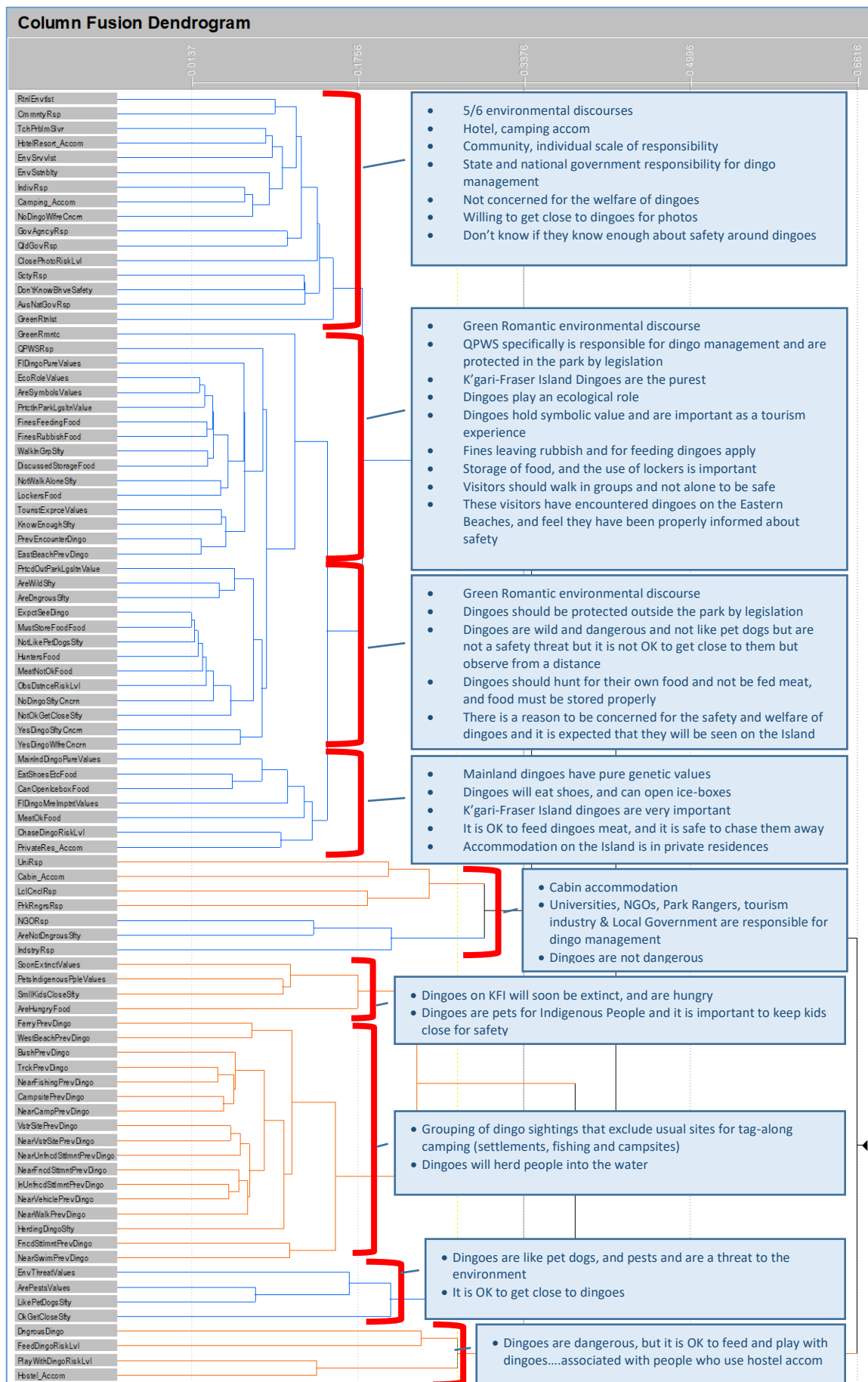


Figure 30: Column fusion dendrogram showing relationships between values and ways dingoes are valued and regarded in terms of safety

The two-way table demonstrates the association between groups of people (social assemblages) and the values that have defined their similarity. The green shading in the two-way table shows areas of significant difference between social assemblages. The right hand column shows the survey participant identification numbers with the social assemblages divided by the dark horizontal lines. Thus, sub-social assemblages 1 – 3 are the first from the top, followed by three larger social assemblages (4 – 6) and finally another sub-social assemblage, 7. A distinctive characterisation of SA 4 (shaded in green) is that they have low association with a range of *dingo-safety* messages, including walking in groups for safety and food storage. In addition, this SA does not consider conservation of dingoes either on or off the Island to be important and this includes low valuing of dingoes as iconic symbols with special value. While SA 5 has similar values to SA 6 it differs by having somewhat more experience in where they have seen dingoes. This group of people is quite similar to sub-SA 7 who differ in their lack of concern for the welfare of dingoes.

There is a difference between people visiting the Island for recreational purposes probably related to fishing and camping as domestic visitors, and those who are visiting as self-drive or tag-along tours who hold Green environmental discourses. The access to information on appropriate behaviour that keeps separation between dingoes and people is more likely to be in practice by those who have received information through the tourism operators responsible for their safety. This strategy appears to be successful.

The numerical taxonomy shows how people hold values and behaviours in common with one another. The analysis indicates significant differences between those who have environmental values that are Green Romantic, or Green Rationalism, in contrast with those who hold other environmental values. There are significant differences in the way people will behave around dingoes (or say they will behave according to the survey question) and the kind of experience they are seeking in visiting the Island. The analysis clearly identified two groups of ‘outsider’ values indicating a difference between those people who are more likely to feed dingoes and other visitors to the Island. In addition, it appears that people who have stayed in hotel accommodation or may be camping (likely the domestic visitors) are not accessing safety information on dingoes that they are applying. They indicate that they do not know enough about safe behaviour around dingoes.

5.8 Summary of survey analysis

The survey results reveal that self-drive tourists are the most common visitor to K’gari-Fraser Island, followed closely by campers, and that these groups often overlap. Less common visitation reasons collected in the survey are tour bus, boating, walking, resort goers and party/event attendees.

Given QPWS figures show annual visitation by campers to be around ¼ of visitors, there is some disproportion in the study. The lower number of tour bus visitors in the statistics is due to the in-field observation that these groups were less willing to participate, due to time

restraints and, at times, whether the tour guide was predisposed to supporting survey participation. Walkers, resort goers and boating enthusiasts were simply less visible in the survey taking, but their qualitative positions were recorded. QPWS figures show annual visitation is around 350,000 to 400,000 and approximately 93,000 visitors stay on QPWS estate so buses, resort guests, etc make up the clear majority of visitors.

Most visitors stay overnight for between 3 days to a week. Valuing of the K'gari-Fraser Island's future and the need for sustainability are high amongst personal social values and while many saw government/ QPWS as responsible, the environmental discourses indicate a receptiveness to individual roles in stewardship. Dingo welfare and expectations of seeing a dingo dominate respondents' concern over personal safety, but many have absorbed aspects of the *dingo-safe* message, such as not feeding dingoes. The survey results reveal the importance of the brochure, signage and the website and the need to collaborate with tourist information providers.

The numerical patterning reveals complex relationships between the types of values held by various people and the sorts of information they sought and how they accessed that information. A significant number of people visiting K'gari-Fraser Island exhibited environmental values in their survey responses. Many also identified with environmental discourses and saw dingo conservation as a priority. These people seem to use both tourism sector communication and the brochures available at the exit points to the Island and absorb communication messages. But people who do not identify the dingo as a significant part of their reason for visiting the Island or do not perceive the dingo as central to the environmental values of K'gari-Fraser Island are also more likely to have an encounter (i.e. unintentional feeding) and less likely to have absorbed *dingo-safe* communication.

6 Communicating and recording human-dingo incidents as part of communication planning

This research initially planned to map the geospatial patterns of human-dingo incidents for the purposes of: (1) understanding the ways communication and place intersect; (2) addressing issues such as where visitors are least likely to follow *dingo-safe* strategies; (3) understanding what the spatial distribution of incidents reveals about dingo attacks. This research component became unviable due to changes in the research team and the nature of the QPWS human-dingo incident data and the situation was clarified in early progress reports. Geospatial mapping would provide significant insights into visitor and resident problem interactions with dingoes, but the QPWS data is ill suited (in its current form) to this mapping due to a lack of Excel data entries and GPS coordinates. Given the contentiousness of public perception and visibility of lethal management (revealed in stakeholder and survey data and in the literature review) we would suggest that a better understanding of the current processes for coding and humanely destroying animals will benefit positive communication and QPWS public relations. To this end initial qualitative analysis of the data for the purposes of improving future data gathering and communication of research is included below.

6.1 QPWS data

The data regarding dingo interactions and incidents, supplied by QPWS, date back to 1990 (over 15 years of incidents). However, the form in which data is recorded was not uniform until mid-2011 onwards. Data elements are missing from the reports recorded, including serious incidents such as the attack and death of Clinton Gage. There are years where few incidents were recorded and, even in the more recent years, months with few or no incidents recorded. It is not clear if this inconsistency is due to failures in reporting or in reduced incidents. There is no comment correlation between incident and human activities preceding the incidents.

An issue with the human-dingo incident record is inconsistency in frequency and detail of reporting. The data from 1991 to September 2001 is inconsistent, with the number of incidents reported ranging from 7 in 1991, 5 in 1992, jumping up to 33 in '93, 72 in '94, then only one incident in '95, peaking with 115 incidents during '97, then down to 6 in 2000, and 8 recorded in 2001. The record does not make it clear whether this is due to sporadic troughs and peaks in actual incidents or inconsistency in reporting of incidents. In addition, the information recorded in the table is minimal and incomplete. Descriptions are brief and locations are broadly listed – sometimes no location is recorded. The 'incident type' description is very brief with the most common type recorded being 'bite'. Of the 81 incidents recorded in '98 approximately 90% of the incident types are listed as 'bite'. This type of incident would be classified as Code E in later years. While there are some, mostly

very brief, details of incidents provided in the 'brief incident description' column, there are no action reports, recommended actions or notes of what action was taken regarding the dingoes.

The description and information recorded for the fatal attack on Clinton Gage in April 2001 is noted as: '30/04/2001 - E - Death - Waddy Point'. The Word document, titled 'Dingo Incidents 10-8-1990 to 1-9-2001', does not include the Clinton Gage incident on 30 April, 2001, but does include reports of three incidents in April in the lead up to Clinton's death and one incident in June after the attack.

The data regarding action taken on dingo incidents is sparse. Inconsistency can be found not only in reporting in the master data spreadsheets as opposed to individual reports in the 'serious incidents' data (which only dates to 2003), but also the particular rangers recommending or carrying out 'humane destruction' of dingoes. This data in the monthly Excel spreadsheets for each year were not consistent with the data in the individual 'serious incidents' reports with only some of the reports of 'humane destruction' actions recorded in the spreadsheets corresponding to individual incident reports filed. Further, there were some individual incident reports of humane destruction in the 'serious incidents' folder that were not included in the master monthly spreadsheets for each year. Comparison of the spreadsheet data with the extra individual reports of euthanasia indicates numbers of dingoes humanely destroyed were more than the number recorded in the master spreadsheets for seven of the 12 years between 2002 and 2013. The euthanasia protocol, processes and roles of particular rangers on K'gari-Fraser Island are not clear in the data. These are frequently sought through freedom of information, thus may impact on public relations for rangers, even suggesting particular rangers are anti-dingo.

A further inconsistency was identified in the discrepancy in numbers of humane destructions of K'gari-Fraser Island dingoes in reports and databases. The Ecosure 2012 report references the QPWS 'humane destruction database', stating that '135 dingoes have been destroyed since 1992' (Ecosure 2012: 82). Ben Allen (2015), who was employed by Ecosure as a consultant, states 'only 110 dingoes have been humanely euthanised for unacceptable or dangerous behaviour... between January 2001 and September 2013. However, the number of humane destruction actions taken or proposed in the dingo incident report data provided by QPWS for this project are higher, totalling 137 from January 2002 to December 2013 period. Some of the recommendations recorded may not have been actioned to full lethal outcome for individual dingoes. Nonetheless, this discrepancy in calculations is still significant, given not all humane destructions are recorded in the monthly or annual Excel workbooks or in individual serious incident reports, and these annual totals do not include the 32 deaths in 2001 or any before 2001. It is not clear from this data if there is a separate destruction log.

Information regarding actions taken and proposed became more detailed after 2011. Prior to this the majority of reports recommended 'monitoring or hazing' for appropriate action.

From 2011, actions were more nuanced and varied such as install sign, trap and tag, advise barge operators to advise visitors, and consider temporary closures. Humane destruction action decreased sharply from 2012 onwards, with three recommendations in 2012, two in 2013 and none recorded in 2014 or up to June 2015.

Presentation and depth of data provided improves over the years with the most recent data from January to June 2015 containing some effective summaries of incidents, dingo behaviours, actions or proposed actions, and risk areas. The 2015 monthly reports January to June in Excel format include summary data of incidents for years from 1999 to June 2015. Data show Code D & E incidents peaking in 2010-2012 and also high in 2004 and 2014. The 2015 folder also contains an Excel workbook summary of risk areas and locations for the year (Jan-Jun). The data is very well presented, separating Code C, D & E incidents for each month in 65 different locations on the Island. In contrast to early incident reports, the description of incident locations increased in specificity over the last few years. However, there are still no GPS coordinates provided, which limits the ability to accurately map risk areas for specific management.

6.2 Summary of qualitative analysis of human-dingo incident data

This brief qualitative analysis has shown that QPWS has been improving the quality of the data collection around the frequency and circumstances of human-dingo incidence in recent years. But there is a need for consistency and increased detail in information recorded. This is particularly in the areas of: GPS locations of incidents; human activities preceding events; communication forms accessed by human involved in incidents; description of dingo behaviour preceding the incident; and clarity of outcomes for dingo identified in the incident. Once data collection procedures are enhanced, there is room to use the data in broader research and consultation, including in discussion of scientific evaluation of dingo behaviours recorded, and mapping and correlations of patterns and locations of incidents.

7 Commentary on communication media strategies and tactics

As a public organisation with legal responsibilities for K’gari-Fraser Island, QPWS has the power to deploy its resources to set the agenda and frame stories in order to engage stakeholders and audiences including the news media. Strategic media communication provides QPWS with the means of defining the content of information provided on dingoes and the K’gari-Fraser Island context. While beyond the ambit of the original grant proposal, this section of the report provides a tertiary overview of various communication media currently used by QPWS. The continuing incidents that involve people and dingoes and difficulties in the dingo management situation found on the Island require that communication regarding dingoes be clear and consistent. Managing the consistency with other forms of media would be aided by creative design through a common theme and meaning, and tailored to accommodate the values of the range of stakeholders.

Currently, QPWS’s communication and interpretation framing regarding dingoes in the various media includes a focus on ecology, wildness (anti feeding), danger and response to danger (*dingo-safe* strategy). QPWS has created a range of online and offline communication pathways for a range of stakeholders. However, these are presented solely through a central route manner and peripheral routes need to be considered to reinforce these messages (see Sheehan & Xavier 2014). As discussed earlier, in communication theory, the central route might be defined as the content of the message itself, whilst peripheral routes include other cues, such as trusting the authority of the messenger, or admiring the aesthetics of the message’s delivery. In practice, the central route might be a standard brochure, while a peripheral route might be a celebrity endorsement.

The World Heritage status of K’gari-Fraser Island, combined with high visitor desirability, also invites communication messages around news and scientific value, potentially including the voices of scientists, tourists, Indigenous peoples, politicians and celebrities. This form of communication could provide education about appropriate visitor behaviour in relation to dingoes to avoid harm to people, and would assist in minimising the need for lethal management of “problem dingoes”. A review of effectiveness of interpretation materials and approaches on K’gari-Fraser Island as it supports management priorities is essential to both achieve the stated goals of communication and target funds effectively.

7.1 Managing face-to-face communication

Interpretation delivered during the ecotourism experience has been shown to increase visitor knowledge, contribute towards supportive attitudes towards the host area, and encourage environmental behavioural intentions (Powell and Ham, 2008). Rangers, tour guides and trained volunteers (a future possibility) can increase visitor knowledge through interpretive programs, interaction mediation, and role-modelling appropriate behaviour.

In this research, many stakeholder and survey participants reported personal forms of communication with rangers and other tour operators (when carried out) as being very effective. This type of individualised communication has lasting impacts on visitors, particularly in terms of conveying the seriousness of dingo encounters but also conveying an interpretation ethos of love for and protection of the Island. In the surveys conducted for this report non-media communication forms ranked most highly from 1- 3 in order of importance cited the 'friends' as information source of most importance (33%), followed by family (17%) and rangers (16%).

Rangers and K'gari-Fraser Island management staff are required to interact with various stakeholder groups both in defence of QPWS policy, and in the role of communicators and educators. The current contested situation often resulting from the lethal management of dingoes has resulted in some negative public image for QPWS, and some expressions of dissent from members of stakeholder groups including, but not limited to, members of the Butchulla community, fishing community, some scientists, tourists, tour guides and animal advocacy groups.

During the course of this research there have been communications incidents in which rangers and QPWS staff did not appear to be clear as to the agenda of meetings or appropriately briefed on video footage presented. Stakeholder interest groups may be antagonistic to current practice on dingo lethal management, thus QPWS staff must be clear as to the rationale and results of their management practice.

In other international contexts, Parks managers have actively sought interaction with and support from communities of identity (such as volunteers, interest communities and civil society) resulting in partnerships that are collaborative (see literature recommendations). This approach significantly reduces the potential of managers and interest groups speaking at cross purposes. Answers to contested issues such as population sustainability and diet depend on a well-informed and confident communications approach that engages and suggests pathways for solutions. Incidents in communications between contesting positions from the outside present the appearance of communication based on preceding presumptions about the other party's position and agenda. A strong emphasis in these community interactions should be to identify and generate greater clarity over *shared* communication goals, roles and a dingo conservation agenda.

7.1.1 Generating partnerships in communication

As part of this research project, a dingo themed promotional event was developed and staged by public relations students enrolled in the University of the Sunshine Coast course CMN243 in October 2015. This event generated much publicity for the *dingo-safe* message, but also functioned as a 'test case' for what staged educational events might look like in the K'gari-Fraser Island context.

QPWS were invited to attach their brand to this student-led promotion, but declined due to time restrictions. The major impediment was that participation in such an event requires

consultation at several levels to ensure compliance with departmental directives, funding priorities and staffing requirements. QPWS provided students with a liaison person to discuss planning and approach for the event, but the students were given little advice on communication and were not permitted to use the QPWS brand as part of the event even though they were using QPWS brochures and messages. QPWS stipulated that the event not be promoted to the media using QPWS branding.

Working partnerships and management transparency can only improve QPWS's public image. An institutional culture of reducing partnership communication and pro-active communication events and acts limits opportunities to engage sympathetic interests. Ranger evaluation of the event after the fact acknowledged the event as well organised and effective. So, whilst this was a missed opportunity for QPWS to gain peripheral communication and positive public relations, it highlighted the need for any future communication opportunities to be presented well in advance.

The final event was admittedly small, accessing 90 backpackers over one day. It helped promote public understanding of the dingo via news releases, boosted for, and by, the backpackers who participated and shared their learnings and stories of fun on social media. The social media site was created by USC students. The event included 'dingo bingo', dingo tag racing games and other interactive activities designed to increase backpacker knowledge of *dingo-safe* strategies and dingo ecology. Attendees competed for prizes donated by various Sunshine Coast businesses, such as Underwater World. Similar creative communication projects would be of significant benefit as part of a suite of communications events for QPWS.

7.2 Brief evaluation of selected signage, brochure and web material

In research into human-bear conflicts in Yosemite National Park Lackey and Ham (2003) found that 44% of people ignored signage and 32% glanced at signs for less than two seconds. To hold the attention of the remaining 24% of visitors, sign messages were brief and vivid, including emotion and humour to retain viewers for more than 20 seconds (Lackey and Ham, 2003).

Hall et al. (2001) found that empathetic and narrative messages about food storage in bear country received the most positive behavioural response from visitors. Narrative messages about consequences for dingoes as a result of inappropriate visitor behaviour may appeal to empathy and encourage appropriate behaviour.

Relevant recommendations from a literature review on safety signage for the QPWS (Weiler *et al.* 2015) include:

- Safety signs must be located near the site of the hazard and contrast in colour, shape, style and placement (centre of vision, perpendicular to track and separate from other information) to attract attention

- Safety signs must present a graphic representation of danger; short, familiar words (DANGER; WARNING) in larger red or yellow font (indicates risk); proscriptive (do not) language; and multiple languages as appropriate
- Safety signs must present a simple hazard statement with symbol (e.g. slash negation symbols), showing how to avoid the hazard or behave appropriately, and an example of the severity of possible consequences.

A mix of proscriptive and prescriptive messages as part of a sign hierarchy is appropriate. These recommendations can be developed with Lackey and Ham's (2003) insight to ensure emotive connection, order and humour are used.

This research includes a brief review of QPWS signage as provided by QPWS, and includes signs viewed during site visits. It is worth noting that a communications program has not documented the installation of signs, or mapped the distribution of signs. This correlates with the limited information on geospatial distribution of inappropriate dingo-human interactions. A brief evaluation of 35 signs against the findings of Weiler *et al.*'s comprehensive literature review on best signage practice (2015) reveals signage on K'gari-Fraser Island is characterised by the following:

- Proscriptive signage (about what not to do) dominates
- There were several different brands in evidence; World Heritage listing logo is small and insignificant
- Older signs are not replaced by newer signs.
- The strongest safety messages, according to recent research (Weiler *et al.* 2015), were signs that used drawings showing appropriate and inappropriate behaviour with a green tick or red cross (see Figure 33)
- The least effective were a list of things to do or not do with no visuals to support the information. (see Figure 35)
- The short and rhyming signs may not present a strong message to visitors and may be difficult to decipher linguistically and visually because they are
 - highly abstract
 - do not make a strong appeal to humour, narrative, affect/emotion or stewardship values
 - are visually unclear, for example Figure 34
- Messages about dingo ecology are not always separated from signage about appropriate human behaviour creating confusion (see Figure 32)
- There were no signs in the sample that overtly expressly mentioned the significance of the dingo population and encouraged stewardship
- There were no signs that mentioned the relationship between Butchulla people and dingoes.



Figure 32: Dingo Encounters sign. Source: Queensland Government.



Figure 33: Do's and Don'ts sign. Source: Queensland Government.

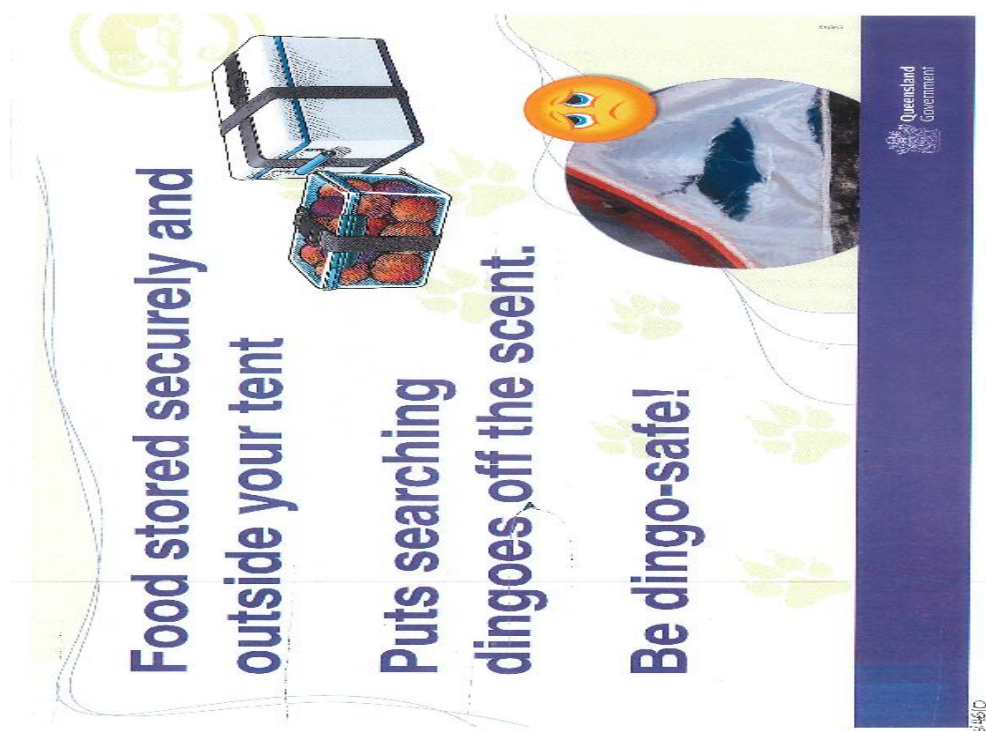


Figure 34: Off the Scent sign. Source: Queensland Government.

Living wild on Fraser Island



Dingoes roam wild all over the island. The seasons determine their activities and survival. Throughout a year they hunt, mate, fight for territories and bring up pups.



A year in the life of dingoes

Dingoes' natural behaviour changes throughout the year—it's all about dominance and food.

Dingoes in submissive and dominant stance. Illustrations: Maria-Anne Loi for Queensland Government.



Summer (December to February)

Testing strength

Pups learn pack rules through play, showing aggressive behaviour to gain dominance. Young dingoes will try to dominate people, especially children. Children entangled in dingo play can be mauled or killed.

Autumn (March to May)

Mating—a time of dominance

Adults compete to mate and will fight to protect their territory—to the death if necessary. Some dingoes will also try to dominate humans by snarling, nipping or biting.



Winter (June to August)

Feeding newborn pups

Dingoes are opportunistic feeders, eating whatever they can find. Mothers may be aggressive in search of food for pups.



Pack facts

Dingo packs—of up to 12 animals—observe a strict hierarchy among males and females.

Dingoes hunt for prey and food within well-defined home territories, across the island.

Pack leaders, or alpha dingoes, appear healthier and well fed.

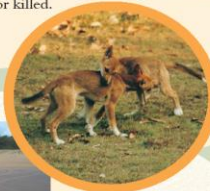
Subordinate and scapegoat pack dingoes are generally thinner and leaner.

These must submit to the dominant dingoes. They crouch, cough and fold their tails between their legs to gain access to available food.

Dominant pairs breed once each year. Other pack members help to rear pups.



Fraser's dingoes are healthy, but they are naturally thin. All photos, Queensland Government.



Spring (September to November)

Pups learning survival skills from their parents

If food from humans is available, pups may not learn natural hunting skills. Adult dingoes and pups may regard humans as competitors for that food and can become aggressive.

You're visitors in dingo territory Be dingo-safe!

- Always stay within arm's reach of children, even small teenagers.
- Walk in groups.
- NEVER feed dingoes*.
- Never encourage or excite dingoes.
- Lock up your food stores*.
- Pack away your food scraps*.
- Keep fish, bait and berley off the ground and in sealed containers*.
- Make your tent boring for dingoes—keep your belongings in locked boxes or vehicles*.
- If threatened back away, don't run or wave your arms.
- *Penalties apply.

Report dingo interactions, including irresponsible behaviour, to dingo.ranger@npsr.qld.gov.au



Queensland Government

Figure 35: Living Wild on Fraser Island sign. Source: Queensland Government.

7.2.1 Print material

A cursory analysis of some of the brochures and printed materials indicates that there is room to increase sophistication and creativity in this collateral. The materials are informative but not always engaging.

The materials selected for analysis are the three key brochures provided at the main entry points to the Island: the *dingo-safe* leaflet, the dingoes of Fraser Island (K'gari) brochure, and the discovery brochure – 'Keep discovering'. The survey data analysed for this report demonstrates that these brochures (when read and accessed) are crucial entry point media. According to the analysis in this report, they are already achieving a degree of efficacy in promotion of the *dingo-safe* message.

The one-page *dingo-safe* leaflet is clear and direct with a consistent safety message. That message is nuanced in that the 'some dingoes are dangerous' message is given the clear caveat 'because people have fed them'. It is a communication strength that this human responsibility message is given primacy in the leaflet. However, it is text dominated and could be enhanced through repetition of some of the clear 'do's and don'ts' symbols used in other QPWS signage (see Figure 33). The *dingo-safe* leaflet also uses muted and disengaging colouring.

The dingoes of Fraser Island (K'gari) brochure is quite textually cluttered. There is a lot of information that swings between safety and ecological messaging. There is an attempt to communicate to various audiences with the inclusion on each page of a 'kids' story corner'. There is not much evidence that concept mapping has been done to ensure forms of communication in this section are targeted to a child audience as the material is essentially non-engaging ecological descriptions.

Concept mapping involves considering: the various meanings the dingo conveys to the different strata of audiences; how best to imagine the dingo in communications; and what is best to be strategically associated and juxtaposed with the dingo to achieve particular outcomes among particular stakeholders. The ecological information in the story corner section could assist in creating informed future adult visitors with a conservation ethos. The information can be made more engaging through increased narrative and empathy building elements, and through increased concept mapping specifically for the audience. The information on food / detritus containment and anti-feeding is mostly proscriptive and focused on safety rather than stewardship or conservation of the animal.

The printed foldable brochure titled 'Keep Discovering' presents a map of the Island and offers information about important scenes, spots, lakes, activities and animals. The dingoes are presented as wild animals, semantically consistent with the *dingo-safe* message. The pro-conservation message could be enhanced. It is important to sell the message more energetically while making the point about safety central. The message next to one dingo

image reads: 'Keep a look-out ... for Fraser's wild dingoes especially early morning, late afternoon and at night. Let them roam free and find their own food'. These words connect to other words on the brochure, all linked to the theme 'discover'. The words used for other icons and places are 'explore', 'have a whale of a time', 'breathe', 'stroll', 'imagine', and 'enjoy'. Dingoes, then, are presented as part of what can be looked for and discovered within the subtext of the brochure. This may increase anticipation and expectation of seeing a dingo. The safety message is confusing in this brochure, as dingo safety is not listed under safety headings. The dingo-safe message is not always consistently branded in this way in the discovery brochure and is placed in various sections of the brochure.

It is clear the newer online version of the discovery brochure has initiated steps to more peripheral messaging (see <http://www.npsr.qld.gov.au/parks/fraser/pdf/fraser-island-visitorguide.pdf>). This online version of the visitor guide is framed with Indigenous art and language, and opens with a welcome from an Indigenous ranger. It includes pithy quotes around various rangers' favourite spots on K'gari-Fraser Island. These operate in positive communicative ways to evoke personal narratives and connections with the Island. But there are no other stakeholder perspectives present. Dingo specific printed material can build on this updated online brochure by using these forms of communication in more empathy building and narrative forms to increase representations beyond QPWS: for example, a Butchulla representative presenting a narrative on dingo information through analogy and experience. It is crucial to the World Heritage listing identity of the park that these concepts of human values and conservation should emerge as central.

7.2.2 The website

The website provides a crucial interface for many visitors to the Island. It is their first port of call to access vital information about tides, camping, visitor permits and access. Brief qualitative analysis was carried out on the Queensland Government's Department of National Parks, Sport and Racing's Fraser Island Great Sandy National Park's link title 'About Fraser Island dingoes': <http://www.npsr.qld.gov.au/parks/fraser/fraser-island-dingoes.html>. This is the main page for dingo information. It is characterised by the following communicative features:

- Very detailed information on the appearance, reproductive behaviour, markings, colours, and other significant dingo descriptors
- *Myths and realities (FAQ)* page: text is defensive in tone and the questions focus on danger
- Interaction with locals is described as rare because of fencing, and it is depicted by photos of dingo-deterrent grids and fences
- *People-dingo interactions* page: three main photos start with negative pictures and end with one positive

- *Be dingo-safe! On Fraser Island* page: links on the top of the page start with the words 'threat' and 'danger'; all the actual educational information is placed peripherally indicating low importance at the end of the list
- Photos of dingo bites on humans
- Difficult to access albums of dingo photos that are not well organised.

Overall the website provides interesting ecological information. It is also clear on the threat posed by dingoes. Unfortunately, it is cluttered and difficult to navigate, therefore not user friendly. The QPWS website is also densely populated by links and at times difficult to navigate. The dingo section of the website includes a focus on ecology and safety but has so many components that the message becomes confused. Audio visual material seems out of date and is difficult to play and appears on several different locations of the website. The images are hard to find, located in sub folders and albums. The FAQs section reads as defensive and is legitimated by 20 year old references, which have themselves been subject to recent scholarly scrutiny (Probyn-Rapsey, 2015). The focus appears to be meeting legislated requirements for safety messages, and minimising need for managing safety associated incidents, rather than sharing information on a World Heritage listed site.

There are also significant absences within the website communication of messages relating to the dingo. There is no information on the connection of dingoes and traditional owners of the land. This needs reconsideration as the dingo forms a significant part of Indigenous culture. The cultural significance to Indigenous (and other stakeholders) of dingoes can be narrativised in a positive and humane manner without compromising the *dingo-safe* strategy. Empathy with the animal is likely to create more compliance with *dingo-safe* strategies providing space to increase positive (not sentimental) stories about the dingoes that would evoke an affect-driven (or, an emotional response-driven) imperative to comply with *dingo-safe* strategies. Cultivating a desire to act as stewards or enhance an interpretive approach to the animals is key. Additionally, the website has too many sub-pages on dingoes repeating the same information. Dingoes overall are depicted as dangerous animals. Most repeated words used are referring to dingoes as 'pests', 'dangerous', 'aggressive', and 'high-risk'. Rethinking of these words is required to emphasise the positive 'zero-risk' of dingo avoidance and how that is in line with a conservation ethos.

One way to reconsider the website is through comparison with the effectiveness of another World Heritage listed site's website: YNP. The key site of YNP communication and interpretation beyond the physical park is the website. It is visually clear and not densely populated with links. It includes short and easy-to-follow links with information on broad safety advice and advice categorised by animal (such as bear, bison, wolf, cougar, coyote). It has a 'learn' section with a series of short and accessible videos in a FAQ format, mostly hosted by scientist Doug Smith, (2016). Smith's videos and publications can be read as a form of peripheral communication; he acts as a figure of stewardship and scholarly research

into wolves and other animals. In terms of education and redress of visitor desire to see and 'experience' dangerous or rare animals it has a media section devoted to short clips of audio or visual material (for example, wolf packs playing, wolf howls).

In the fast-moving world of online communications, it is prudent to conduct regular analysis of insights, including analytics around visitor reach and engagement. This type of scrutiny of the ways in which these dingo messaging websites are being used and interpreted would provide valuable insight into what is 'working' or not for online information seekers. At a basic level, tracking which links are attracting click through and how long each visitor remains reading that page will assist in synthesising information into the most accessible and user-friendly arrangements.

7.2.3 The QPWS Facebook page

The Queensland National Parks Facebook page is a positive social media innovation showing implementation of previous policy review documents and advice that may be better used. It is characterised by the following features:

- Overall one post per day, usually a photo with either a caption or short story
- General picture of the scenery or photos of the local fauna, a few kangaroo photos
- First (and only) photo of dingoes is on the 12th of September. Dingoes are at the beach eating a whale carcass. Caption: 'It' not pretty but that's nature'. This is clearly a semantic embedding of the safety message: wild dingoes eat wild food sources, which counters myths implicitly. It assumes audience values that the image is unpleasant or unexpected.
- Animal photos are diverse, especially focussing on possums, lizards, snakes and sea life
- Photography can be reframed positively to enhance education possibilities
- Low levels of visitor interactivity are present, but it seems when visitors post comments and queries they are responded to promptly and with humour and empathy
- Scrolled back to the beginning of July, 2016. There was only one photo/post (the one above) on dingoes
- Possible key message: the best outcome is minimal interaction with dingoes - *they are mysterious, part of Australian cultural tradition and best admired from a distance.*

There appears to be a consensus in media reporting on dingo attacks that they are caused by lack of education; that is, people feeding them, ignoring safety messages, being alone on beaches, allowing children out of reach, or wanting to take photos. Media responses also show that the public is outraged by dingo lethal management. These points suggest that while Facebook is used consistently with the *dingo-safe* message (wild dingoes, wild food, park promotion), it not been used in a targeted form. The public seems responsive to overt

messages of this kind and a K'gari-Fraser Island dedicated Facebook page with more regular promotion of nuanced information may be beneficial. Anything QPWS can do to take control of a positive, advocacy and pro dingo message is desirable.

7.3 Research and communication

Organisational research into knowing visitors and those who interact with visitors has been demonstrated to improve effective interpretation towards sustainable tourism (Weiler, et al. 2016, Moscardo, 2014 and Skibins et al. 2012). The sorts of research park management organisations can do include gathering data on:

- Tour guide discourse and interaction with visitors towards improving messages and role modelling
- Visitor demographics; motivation; and preferences in messaging (Porter and Howard, 2002); trip expectations; and preferred activities.

In addition, it is clear that not just proactivity in media but responsiveness and evaluation of media is crucial to positive Parks communication and management. Conservation management and planning relies on strategic communication to promote changes in human attitudes to Parks and its animals (Ernoul and Wardell-Johnson 2016). Ongoing media analysis provides an insight into the broader social issues and a way to gauge responses to management issues and the best pathways of communication (Ernoul and Wardell-Johnson 2016).

7.4 Summary of communication analysis

The interpretation messages are best founded on creative conceptual mapping of the dingo. This would require a bottom-up, grassroots orientation. This requires empowerment of key stakeholders who can assist as claims-makers for QPWS and can result in authentic and clear meanings to encourage public re-thinking of their expectations and behaviour around the dingo. The process of knowledge transfer needs to occur and acknowledge contentious and contrasting positions. Then QPWS can function as an active change agent that engineers a societal conservation ethos and sets the agenda for prioritisation of the issue of dingo management.

This section provided very tertiary evaluation of the communication media currently at use and provided some theoretical directions for enhancing and clarifying communication tactics. Primarily these lie in cohesion of message, and inspiring people to act with an understanding of conservation and stewardship responsibilities. There are points where QPWS signage, social and written media are in alignment with research on best communication practice, including some use of simplicity in symbols, use of affective connection to conservation message, narrative and bright colours along with a mix of proscriptive and prescriptive messages. There is, however, room to enhance some problem areas such as the textually heavy, abstract and mixed forms of messages. Attempts to update signage and other forms of communication do not seem to be accompanied by audit of and removal of outdated information. This results in mixed messaging, with desired

outcomes hampered by cluttered signage. There does not seem to be evidence of co-design – for example, between rangers and other educators, or between Parks and the Butchulla people. Collaboration across communication media would result in more regular revisions of messaging.

8 Recommendations

The subsequent recommendations section of this report draws out the key recommendations in each of the data commentary sections of the report. These include expanding and explicating the recommendations emerging from the literature review section, the stakeholder analysis, the survey analysis, the brief analysis of human-dingo incident data and the review of communication media interacted with and used by QPWS. Each section has its own recommendations and is followed by a summary list of these recommendations.

8.1 Recommendations emerging from literature review

The literature review covered aspects of management practice and human dimensions of wildlife management (of which communication is just one part). The literature review found it is often difficult to discern in policy and in practice the distinction between management and communication and this implies that human dimensions of management are much more central and require crucial integration into all aspects of management. Management practices can affect visitor and stakeholder receptiveness to communication messages. Visitor and stakeholder investment in a common agenda is shown to be beneficial in all aspects of human dimensions of wildlife management. Internationally there is much research into the benefits of adaptive management practice that incorporates perspective and views of stakeholders into management practice and into the co-design of communication messages. The literature also reflects a focus on the need for park management to be proactive in their relationship with media and publication: conducting and promoting their research in ways that go beyond understanding of park management as responsible for only operational and engineering aspects of the park. This overall results in more focus on people than animals in parks and wildlife management in international best practice. The recommendations focus emerging from the literature review are thematically organised into: research, dissemination and ongoing communication *and* authentic stakeholder collaboration and consultation.

8.1.1 Research, dissemination and ongoing communication

The research literature exposes a common thread of interpretation approaches: encouraging humans to act as stewards and enact conservation behaviour through adaptive management, over intervention, controlling or corralling animal and human behaviour, at all levels of communication. This may require some revision of communication media, including signage, web, ranger communication, media releases and an increase in good news stories. Ideally this involves large scale revision of structural interpretation components, such as signage, public relations and explicit communication training for ranger staff. It can also extend to mandatory professional development for tour guides and other personnel, and liaising frequently with visitors to expedite change. Weiler and Walker (2014) have researched rangers and tour guides in the Pacific Islands, finding communication forms and story as a key mode in promoting visitor interpretation over visitor intervention. These findings make compelling reading for the K'gari-Fraser Island context. An interpretive approach fosters visitor connection with 'natural and cultural

heritage....[in ways] that foster a sense of care and stewardship' (Weiler & Walker 2014: 90) . Most training of tour guides internationally has focused on practical skills and safety accreditation and employing intuition and past experience rather at the expense of explicit communication training (Weiler & Black 2015). Training should 'incorporate content on visitor expectations, the four domains of experience brokering, and the six pillars of interpretive guiding' (Weiler & Walker 2014: 97). The six pillars used in this study were 'involving (active and sensory), thematic, relevant, enjoyable (diverse approaches), emotionally engaging and logical (Weiler & Walker 2014). A significant literature on environmental education informs most interpretive and communications materials elsewhere, and it would be appropriate to apply the international learning in these fields to an important protected area afforded World Heritage status here in Queensland.

Social values can change, and can impact on landscape values (Wardell-Johnson 2011; Hanley et al. 2009). Shifting management focus from managing for past values to anticipating the needs of future values is required. Conservation professions such as those making decisions about, and managing the World Heritage landscapes of K'gari-Fraser Island, express a diverse range of values (Winter 2007; Sandbrook *et al.* 2011). However, there is a need for a shift to focus on future values (Wardell-Johnson et al 2015). This shift has driven conservation strategies in New Zealand through practices based on 'a close collaboration between island communities, managers, social scientists' (Oppel *et al.* 2011: 232). Environmental governance now focuses on active conservation practices anticipating future needs for World Heritage management (Keitt *et al.* 2011). While social values are influenced by context (Fischer 2012), changes in landscape are also driven by changes in social values (and the way nature is valued) (Wardell-Johnson 2015), and by scientific values changing from passive information provision to an active, solutions driven approach (Woinarski *et al.* 2012).

Social norms, values and behaviour are critical elements in conservation (Wardell-Johnson 2015). Thus, there is a need to identify the way people value ecosystems and landscapes, which this research has done. World Heritage management will need strong and visionary legislative controls, as well as social and cultural engagement from park users (Ernoul & Wardell-Johnson 2013). Integrating the concept of equity with environmental sustainability will make important contributions to future-oriented conservation strategies based on stewardship and partnerships on K'gari-Fraser Island (Wardell-Johnson 2015). Identifying the barriers to achieving behavioural change and wider adoption of a conservation ethic appropriate to World Heritage values on K'gari-Fraser Island is essential. Consistent and appropriate interpretation material across the World Heritage area is an essential starting point (Ringer 2013; King *et al.* 2014).

Interpretation is an educational activity that reveals meaning and identifies relationships through illustration and communication of information (Tilden 2007). There are three elements to interpretation: education, meaning and experience. Interpretation is an

educational activity with the intent of persuasive communication. Broadly, interpretation has four main functions: to create visitor experiences, to assist in visitor management, to support tourism development and potentially to contribute to sustainable management of destinations (Moscardo 2015). Education, interpretation and awareness raising is conducted for K'gari-Fraser Island through QPWS programs and made available to visitors at different stages of their trip through (Government of Australia 2002):

- Pre-visit material prior to their trip, including brochures, videos, maps and the web
- Off-site orientation once *en route* to the Island, providing visitors with opportunities to find out about the unique features of the Island through displays
 - in private sector commercial businesses
 - at interpretive displays at River Heads
 - at Visitor Information centres such as Tewantin
 - on barges at entry points to the Island
- On-site orientation (island-wide) at interpretive shelters at campgrounds and day visit areas
- On-site orientation (site-specific) such as at
 - Central Station's old forestry shed converted to a large informative display shelter
 - major campgrounds
 - day use areas, providing special features of the sites
- Site interpretation through interpretive trails such as those developed along Wanggoolba Creek and Middle Rocks boardwalks, Central Station, at Pile Valley and the wreck of the Maheno
- Post-visit reinforcement available through publications such as children's story and colouring books, postcards and posters featuring the Island, and brochures designed as souvenirs

Interpretation material at some of the most highly visited sites on the Island shows values that do not reflect World Heritage listing (Wardell-Johnson 2015). For example, there were no signs in the sample that overtly mentioned the significance of the dingo population and encouraged stewardship, rather than simply showing warnings. Additionally, there were no signs that mentioned the relationship between Butchulla people and dingoes.

Values that were used in past interpretation materials may contradict the conservation values essential for maintaining World Heritage status, emphasising the importance of auditing and replacing dated materials (Wardell-Johnson 2015a). This contrasts with interpretation material near the lakes reflecting contemporary World Heritage and cultural values (Wardell-Johnson et al 2015). Language is important in defining the changing use of environments (Mühlhäusler & Peace 2001), guiding environmental behaviour. In the case of environmental behaviour that is at odds with appropriate human-dingo interactions, interpretation material may help reduce the impact (Littlefair & Buckley 2008). Updated signage and other interpretation materials that effectively promotes World Heritage values would provide significant on-going benefits to conservation of those values. Considerable interpretative material is needed at all access points to the Island, to shift the value framing of visitors to a future beyond historical context and new relationships of respect with dingoes as wild animals with an intrinsic right to habitat unfettered by human impact. Clear differentiation between the gateway points and context of K'gari-Fraser Island is critical to engender engagement of visitor awareness and shift to context-sensitive behaviours appropriate to the World Heritage status of the Island. This is best achieved through dedicated visitor centres at all entry points to the Island (Wardell-Johnson *et al.* 2015). In addition, visitors' centres on the Island would serve as a critical point of monitoring visitor values and practices in a World Heritage context.

It is important that park managers be in control of their own message and brand, becoming the dominant medium in consultative, disseminated well-researched and defensible positions. It is important to define that brand in keeping with the vesting of the park, which in the K'gari-Fraser Island context is World Heritage. Defensible positions require clarity, strategy and research over the forms of reasoning and interests invoked. McDougal *et al.* (in Clark & Gillesberg 2001: 137) suggest the interests effecting dangerous animal management are fourfold:

principled (based on ethics), expedient (based on compromise), assumed (presumed to be the common interest), or scientifically valid (supported by evidence).

Human dimensions of wildlife recognise that the relationships between these different interests or imperatives to management action are complex. But communication is improved when consistent forms of 'interest' are used to defend management actions. To be clear a management act like lethal management can be in defence of human safety due to activities of specific animals (and therefore serve ethical and common good interests). Or lethal management maybe an ecological intervention, a cull to help sustain populations or protect surrounding species.

The significance of interests in communication can be explored through one instance that seems to create controversy and harm to QPWS brand and thus communication efficacy: lethal management. Close reading of the FIDMS document suggests dingo euthanasia is defended through assumed / common good and ecological interests, the protection and

safety of visitors against ‘unacceptable’ dingo behaviour *and* that dingo populations can sustain such targeted cull. But lethal management on K’Gari Fraser Island is an ethical (decision based on a principals) and assumed (common good, i.e. human safety) interest. They are not killed for population control reasons. The reasons of ethics and common interest should be made overt.

The controversy around lethal management is evidenced in stakeholder responses and visitor survey responses. It was cited on more than one occasion as a reason for refusal to participate in the survey. This may stem from a perception of culling being a common response to dingo threats by QPWS; the literature review shows that lethal management of dingoes has, at times, exceeded the frequency of this method in the international context. The rate of culling is dropping, however, and it is important to stakeholder consultation to make this fact clear, and explain why. As we work together to create a greater understanding of our stewardship responsibilities, for example, the pressure on rangers to respond with measures like lethal management are reduced. In this way, as shown throughout this report, there is a joint responsibility involved in holistic management strategies.

To keep returning to the (oft disputed) fact that dingo populations can sustain lethal management is to muddy both the reasoning for the killings (a transparent, regrettable but ethical protection of human safety) *and* the fact that lethal management is reducing. So there is a missed opportunity for QPWS to clarify their position as advocates for dingo welfare and human safety through ethical reasoning.

The literature on managing human-wildlife conflict and DCAs worldwide, including SANParks Management Plans, commonly recommends more research and evaluation to be conducted in order to improve management systems and strategies (see, for example, Treves *et al.* 2006; Baruch-Mordo *et al.* 2009; Can *et al.* 2014; Gore *et al.* 2006; Bogart, Duberstein & Slobe 2009; Acord 1992 ; Nyhus & Tilson 2004). Topics and issues recommended for research and baseline data collection include:

- Local people’s perceptions of risk
- Changing human behaviour
- Management actions
- Education programs
- Resource losses and damage incidents
- Numbers of animals
- Numbers of visitors

Ongoing thorough research and open communication of the outcomes informs the public (Acord 1992: 10; Treves *et al.* 2006: 386). Baseline data relating to wildlife damage and conflict with humans, including behaviour of both human and wildlife involved in incidents, is essential in development of management strategies (Treves *et al.* 2006: 386; Anthony, Scott & Antypas 2010: 236-37). Equally important is monitoring and evaluation of strategies. Baruch-Mordo *et al.* (2009: 221-22) suggest that more research into how well management

strategies change human behaviour is needed to inform wildlife management plans. Systematic monitoring, data collection, record keeping, and effective reporting of human-wildlife interactions, including good news stories (Gore & Knuth 2006), is critical in informing the public so that issues are understood and considered in context (Treves *et al.* 2006: 386; Anthony, Scott & Antypas 2010: 236). Nyhus and Tilson (2004: 72) also recommend better processes for data collection and management of information.

Secondly, the research establishes a role for citizen reports *in conjunction with* rigorous scientifically-based data gathering. Nyhus and Tilson (2004) (in the context of Sumerian tiger management) recommend a database to be constructed where accurate locations, dates, habitat types, victim demographics and reported responses to the incident are recorded. It is important in the K'gari context to have transparent research publication (and other forms of dissemination) on the positive impacts of fencing, the actual rates of lethal management and the concrete impacts on dingo population. Once this data is obtained and disseminated in a strategic and nuanced way it becomes easier to defend the FIDMS from dissent and, more importantly, to communicate *dingo-safety* messages. This goal would be enhanced through meaningful community consultation, collaboration and participation in management.

8.1.2 Authentic stakeholder engagement and collaboration

In optimising tourism sustainability in an island context Lim and Cooper (2009) use a definition that integrates economic viability for both the income stream of the Island's management needs, but also for the associated communities, that is based on conservation of socio-cultural and ecological integrity. They identify unique characteristics of islands as vulnerability, isolation and peripherality to differentiate carrying capacity, community involvement and the particular political and interest communities. Islanders rarely have the power to control their political and economic identity with consequences for economic independence. They recommend that policy and planning focus on positive incentives that promote rehabilitation initiatives of associated communities to support conservation measures.

Many World Heritage sites are threatened by processes of poverty, war, environmental change and the impacts of globalisation (Breen 2007). Multi-stakeholder conflicts persisting over the past 25 years indicate the need for managerial responses that bridge collaborative and adaptive approaches in the governance of protected area management (Plummer & Fennell, 2009). Recommendations (González *et al* 2008) for achieving sustainability in World Heritage sites of natural significance include:

- Promoting a more adaptive resilience-centred co-management model
- Adopting an integrated approach to landscape planning
- Building participative practices and institutional networks

- Promoting transdisciplinary research through social and biophysical sciences.

Promoting precautionary resource management principles based on decision-focused processes (Gregory & Long, 2009) ensures that conservation strategies are negotiated amongst a range of voices, positions and management approaches (Ernoul & Wardell-Johnson 2015). Identifying and managing biophysical and socio-cultural values that define World Heritage listing guides management and operates across multiple scales of governance (local, state, national and international) (Ernoul & Wardell-Johnson 2013, Hughes *et al.* 2007; Stevenson 2000). These approaches have shifted environmental governance from limited consultation to significant collaborative participation (Head & Ryan, 2003). While these shifts show exemplary practice in governance, transparency and institutionalised relationships with civil society and independent scientific advisory groups will give greater security to decision-making for dingoes in protected areas (Wardell-Johnson 2015).

Sustainable tourism is dependent on the involvement and engagement of entry-point and host communities (Wearing and Darcy 2011). Collaboration in the process of planning and management for tourism is critical in the face of changing global values that reflect inclusive practice. Management principles that embrace social sustainability and justice moving beyond purely economic and ecological values in tourism (Wearing and Darcy 2011).

Partnerships between protected areas managers and the tourism sector have been shown to make a significant contribution to understanding and protecting landscape values and biodiversity conservation (Wardell-Johnson 2015). The improved outcomes for these partnerships include social benefits to local communities with associated economic viability of the protected area (Pfueller *et al* 2011). The exclusion of local communities and traditional owners of World Heritage listed landscapes runs counter to practice in most other international settings. Both adjacent communities and First Nations people provide significant opportunities for local development and integration of interests through cross-cultural, community-based conservation initiatives (Ancorenaz *et al* 2007).

On Lord Howe Island, a World Heritage property, their participatory governance structures have enabled the establishment of rules to conserve the local, natural and social environment. This management approach includes capping visitor numbers through available tourist beds on the Island which is carried out by the tourism association itself. This form of collaborative governance requires a conducive governance context (Reis & Hayward 2013). This has ensured that management of ecological processes are sustainable and do not suffer undue pressure from excessive visitor numbers (Wardell-Johnson 2015).

Integrating roles and responsibilities through collaborative decision-making provides reflexive and adaptive capacity in landscape management (Wardell-Johnson 2015). Authentic engagement that acknowledges rights to access and cultural association that includes Indigenous and settler communities provides a central role for communities of

place, identity and interest in addition to the management agencies with formal responsibility (Carter, 2010, Quiroga, 2009). Improving the input of Indigenous knowledge and local knowledge to complement the knowledge of formal science provides a greater potential for reconciling conservation science and practice science and practice with social justice in World Heritage landscapes (Celata & Sanna 2012, Wardell-Johnson *et al.* 2011).

There is evidence to suggest increased transparency and delicate stakeholder consultation increases stakeholder engagement and the success of interpretation and communication goals of protected area management (Treves *et al.* 2006: 386). Part of the issue is the contrary messages existent around K'gari-Fraser Island and the evidence of hostility between some stakeholders and QPWS. Treves *et al.* (2006: 334; 337-338) recommend research into stakeholders' perceptions and perspectives to inform management planning and practices as essential, because socio-political issues influence effective management. This is consistent with much communication research (Fox and Beckoff 2011). More than this, international best practice models suggest that 'a wildlife manager's job is not simply to persuade people to adopt someone's notion of preferred behaviours ... stakeholders often expect clear and complete agency communication (transparency) about management decisions' (Shanahan, Gore & Decker 2012: 157). Research frequently cites that people are often misinformed about human-animal conflict management operations and objectives (Acord 1992: 10). This can be redressed through participatory and adaptive management and communicative practice.

Much of the literature relating to human-wildlife conflict management recommends participatory approaches in planning and implementing management strategies (see Gore 2004; Treves *et al.* 2006; Slagle *et al.* 2013; Rastogi *et al.* 2014; Bogart, Duberstein & Slobe 2009; Anthony, Scott & Antypas 2010; Osborne & Parker 2003). Rastogi *et al.* (2014: 919) suggest that working with stakeholders, such as local communities, tourism professionals and the broader public, in addressing their concerns and encouraging them to be a 'soldier for conservation' or in the YNP context 'taking the ranger pledge' (US National Park Service 2016f) can result in stakeholder support in reserve management and thereby reduce threats to wildlife. Further, Treves *et al.* (2006: 383) argue that not only does co-management and participatory methods help in conservation of wildlife and minimising harm to people within the parks or reserves, but such inclusive approaches can also garner support for conservation in other areas:

Incorporating local stakeholders as partners in planning and implementation can help to win space for wildlife beyond protected area boundaries (Treves *et al.* 2006: 383).

For example, Osborne and Parker (2003: 83) recommend external agencies and wildlife managers work *with* farmers and community to deter human-wildlife conflict, and place more responsibility on farmers for managing the issue rather than relying on compensation for damage. .

Communication and education is imperative to a participatory approach to management. Bogart, Duberstein & Slobe (2009: 442) argue that work with stakeholders and external institutions in planning, implementation and evaluation of wildlife management must be carried out 'through an effective process of strategic communications, outreach, and education'. Lamarque *et al.* (2009: 37) suggest public education and awareness-raising about the value of wildlife and the importance of wildlife in the ecosystem throughout the community can engender commitment towards conservation. For example, training programs for farmers in communities around Kakum National Park in Ghana were effective in teaching them how to be farmer trainers themselves in farm management and non-lethal techniques to prevent wildlife damage to livelihoods (Lamarque *et al.* 2009: 39).

Information about wildlife, conservation and management strategies through reserves and wildlife park interpretation communication and education programs is critical to encourage conservation values and human-wildlife safety. Literature about wildlife management in reserves recommends clear communication about the benefits of wildlife populations and management practices in protection of wildlife from human impacts, including the reasoning behind the practices (see Slagle *et al.* 2013; Ballantyne, Packer & Hughes 2009; Marker & Boast 2015). Ballantyne, Packer & Hughes' (2009: 663) research suggests that tourists are more likely to forego getting close to wildlife for the sake of wildlife protection if they are fully informed about why avoiding feeding or getting close to wildlife will help protect them. They also recommend providing more practical information about what individuals can or should not do to help conservation of wildlife. An effective communications program, however, demands consistent monitoring and updating, thus needs sufficient financial and human resources (Bogart, Duberstein & Slobe 2009: 447).

This review of international literature has explored a range of practical examples of the way in which a range of voices may be engaged to increase local stakeholder involvement and communication goals with visitors. Festivals, PR events, local sponsorship of campaigns on products, and volunteer community rangers can all be used to increase interpretation aims and communication aims. It is important to note here consultation and collaboration in the K'gari-Fraser Island context is a fraught issue, given the historical and potential conflicts over what is best for dingoes. This tension between stakeholders is consistent to wildlife management (particularly of dangerous animals) internationally, but responses to this tension vary between contexts. In the Fraser Island situation, this report posits some work is still required to align stakeholder expectations with an effective communication strategy (Clark, Rutherford & Casey 2005; Decker, Riley & Seimer 2012).

The human dimensions of wildlife management and dangerous wildlife management is an increasing focus for Parks education and professional development internationally. This body of literature including an international journal¹⁴ and the latest educational texts

¹⁴ See *Human Dimensions of Wildlife Management: An International Journal*, which has been publishing 6 issues a year and was started in January 2015 see <http://www.tandfonline.com/toc/uhdw20/current>

(Decker, Riley & Seimer 2012) capture a shift in focus from animal-focused intervention to people focused management. This involves the addition of social sciences and human inquiry models of biological and ecological studies (Shanahan, Gore & Decker 2012). These ideas can inform communication and management practice in the K'gari-Fraser Island context.

8.1.3 Summary literature review recommendations

The recommendations emerging from the literature review and best practice in human dimensions of wildlife management are all synergised around a theme shifting to adaptive human focused approaches and away from animal focused interventions (other than engineering elements to separate humans and animals).

The key findings include the importance of:

- Interpretation approaches that call upon human visitors and stakeholders to engage with parks and the animals who reside there as stewards and conservationists
 - including strategic word choices focusing on the human role in conservation
 - the significance of education and interpretation centres staffed by experienced management staff and volunteers
- Adaptive (changing with consultation) and participatory management approaches
- Participatory co-development of communication and education material
- Emotionally engaging, active/participatory, logical, thematically consistent and hierarchically ordered communication that is visually clear
- Clarifying the interests and reasoning used in all communication and making distinctions between scientific and common good forms
- Understanding of the contentious nature of lethal management and the need for careful communication around this issue
- Maintaining baseline data on many aspects of management, including animal and visitor numbers, management actions and resources lost
- Disseminating research and pro-active engagement of media
- Incorporating citizen science approaches
- Engagement with formal education in terms of harnessing schools and teachers for long term attitudinal change
- Incorporating peripheral communication using volunteers and partnerships.

8.2 Recommendations emerging from the stakeholder analysis

The semantic analysis of stakeholder focus group responses exposes significant differences between three thematic communities: of place, of identity and of interest. The stakeholders' positions gathered through mediated focus group and interview questioning in person over the phone or via email included Butchulla representatives, residents, scientists, FINIA, SFIDO, fishing groups, NGOs and private sector and the tourism sector representatives. This consultation is in effect that of key expert witness panels, and can form the foundation for adaptive management practice and communication that are key recommendations arising through the review of international literature on the subject. A bullet point synopsis of each group outlines explicit differences in recommendations. It must be noted that not all members of each group agreed on all these recommendations but that these recommendations are the one repeated but significant proportion of each group. Finally this section of the recommendations will draw point of synergy and debate within these various groups.

8.2.1 Butchulla traditional owners

The Butchulla traditional owners and Indigenous historical residents recommended:

- Significance of dingoes in Butchulla culture to be given higher visibility and centrality in public communication (signage and brochures) about K'gari-Fraser Island dingoes
- More open communication and information transmission between managers, users and traditional owners about dingo populations, packs and dingo welfare
- Better education for tourists about dingoes and natural values of the Island
- Involvement of experienced Butchulla people in both guided tours and safety training for tourists and tour operators including 4-wheel driving on sand
- More secure and frequent rubbish facilities made available for tourists to access to control waste in campsites and reduce aggressive behaviour of dingoes around food and rubbish
- A formal Butchulla presence in dingo management
- Inclusion of the Butchulla name for dingoes in all communication.

8.2.2 Residents and others with place-based connection

Residents and others with personal place-based connections recommend:

- More education for people about appropriate behaviour when encountering dingoes, particularly staying close to children always, including a focus on what not to do and on dingo rights
- To help protect government agencies from litigation it was suggested visitors sign a disclaimer as part of the permit process before going to the Island; this could cover entering at their own risk, understanding risks dingoes might pose, appropriate behaviour to minimise risk, and not feeding
- Better understanding, respect for and acceptance of normal Fraser Island dingo behaviour; that is, as inquisitive, notorious thieves and opportunistic scavengers, who are not aggressive by nature
- Better warnings about dingoes post November tailor-fishing season with an abrupt discontinuation of abundance of food for dingoes
- More clarity in incident reporting

- concerning dingo behaviour and coding and readjustment about what counts as serious or inappropriate behaviour
- including behaviour of people involved in the lead up to the incident
- Extensive research on
 - the health of the dingo population a
 - the impact of lethal management on packs and other species in the ecological system
- Ban commercial net fishing close to K'gari-Fraser Island

It is important to note that communities of place and identity incorporate activists, and residents have points of synergy and conflict between groups and within groups. For example, there are residents who identify with advocacy group positions and those who do not, and perceive the FIDMS as effective.

8.2.3 Rangers

The focus for rangers was on the problem of resourcing: direct communication is perceived as effective but there are not the human resources currently to action that pervasively. They also discussed their perception of the prevalence of myths and misinformation creating interruptions to communication of the *dingo-safe* message. Rangers recommended several QPWS communication activities including:

- Improve and increase ranger-sourced professional development for different tourism operators, drivers, and staff on the ground for flow on communication to the public
- Increase ranger resourcing
 - generally
 - and in target times: interpretation education during school holidays
- Reduce signage to strategic signage to make it more likely to be read and information absorbed
- Increase in proactive QPWS public communication via marketing and the broader media
 - on the population of dingoes on the Island to allay fears of dingo extinction and anti-ranger sentiment
 - on reducing visitor expectations of encountering dingoes
 - on QPWS responses misinformation reported in the media
- Different approaches to overcome communication barriers and ensure visitors are receiving relevant information
- QPWS to collaborate with the tourism sector in research into visitation and communication in collaboration in areas such as data gathering, data management and marketing of K'gari-Fraser Island.

8.2.4 Scientists

Of all groups the scientists presented some of the most divergent positions in relation to dingo management (especially in terms of the role and appropriateness of lethal management). Scientists recommended the following points of feedback:

- Conduct sufficient research into the ecology and population dynamics of the dingo¹⁵
- Consult diverse scientific dingo expertise in management and coding
- Better management of public who act inappropriately, such as more enforcement regarding non-compliance of *dingo-safe* regulations
- Better management of diverse social values
- More effort made toward positive interactions between rangers and public
- More accurate data about the dingoes for rangers to communicate to the public
- More funding to implement actions to achieve the objectives of FIDMS
- Reduce reliance on public in conclusive identification of dingoes involved in incidents.

It is important to note that perhaps more than any other stakeholder group, scientists present contested rather than synthesised positions. There was significant difference in position on the appropriateness of lethal management and the need to continue or discontinue it. Most agreed on the need to research in relation to dingo populations but several felt strongly that scientific data weighed heavily in favour of discontinuing lethal management. Also contested were the way in which dingoes might be coded and what constituted inappropriate behaviour, so much so as to suggest there is not scientific community consensus on these issues.

All stakeholder groups shared a focus on the need for greater collaboration between various stakeholders, improved research and data gathering activities, and improved transparency and proactivity in QPWS' communication with the media. This is consistent with the recommendations emerging from the review of international literature.

8.2.5 Summary of recommendations emerging from the stakeholder analysis

The K'gari-Fraser Island dingo is a much contested symbol of the Island and there was often disagreement within and between various stakeholder groups and communities. There were however important points of synergy:

- More stakeholder involvement and consultation in development of management strategies
- More stakeholder involvement and consultation in interpretation and communication activities (for example Butchulla guided tours or safety education AND volunteer education)
- Increase QPWS collaboration with tourism sector
- Less intervention in dingo behaviour generally, although not all agree on what this entails
- Greater focus on visitor responsibility
- Increase in quality and depth of data gathering

¹⁵ 75% of scientists interviewed also stated that all lethal management should discontinue until research into efficacy had been conclusively established

- Increase in ranger resourcing and presence
- Increased research into dingo population sustainability
- Increased promotion of research once obtained and increase visibility of QPWS story in media.

8.3 Recommendations emerging From the survey analysis

The commentary section of this report reveals a great many details in terms of stakeholder and visitor understandings, values and use of communication medium. Some of the more important results emerging from this research are that there is not a clear correlation between demographic and choice or preference of communication medium. Most surveyed defined themselves as pro-dingo. And there was strong use of tourism websites and the QPWS brochure resulting in mostly effective absorption of the *dingo-safe* message. It appears those who receive the discovery and *dingo-safe* brochure as part of their centralised entry into the park via barges, ticket and park permits OR those who enter with experienced tour operators have a good understanding of the key messages. Those who enter outside of these entry experiences (such as to resort accommodation via the River Heads Barge or some self-drive visitors who don't access the brochure) have less information, knowledge and more likelihood of negative interaction. This is especially true in cases where visitors do not already have dingo conservation as central to their values or sighting dingoes as key reasons for entering the park. This indicates the need for mandated centralised dissemination of information as more likely to be effective, possibly through designated visitor centres on the Island at key entry points or high visitor use areas. Signage was used by those who did not access such forms but survey participants indicated that there were too many signs with inconsistent and confusing messages at times.

The numerical taxonomy analysis has shown that there are distinct groups of responses to information, awareness of safety around dingoes and interactions with dingoes. There appears to be evidence that some sectors are effective in disseminating information that is proving to be useful for raising awareness about appropriate human interactions with dingoes on KFI, with particular usefulness of direct relationships between tourism operators and 'organised' tours. It appears that people coming onto the Island without the mediation of an information provider (such as fisher people and self-drive domestic campers, and those staying in private residences on the Island) are not necessarily receiving information that is indicating appropriate interactions with dingoes. This provides a useful means of identifying communications investment to address critical safety issues applying differentiated media.

The consistent self-identification of visitors as pro-dingo indicates potential for an interpretation focussed conservation strategy that enhances focus on visitors with positive roles as stewards. An effective stewardship measure (Satterfield *et al.* 2013) indicates the implications of engagement (or lack thereof) for conservation in protected areas. In defining

stewardship Satterfield *et al.* (2013) outline the importance of the cultural components which include both spiritual and practical values. The key recommendation for participatory engagement hinges on the importance of developing “a defensible basis for shared decision making” where stewardship allows negotiation of management alternatives through ongoing dialogue among sectors and voices over time. A poor outcome of stewardship is when one or more key voices is excluded from active participation. A very good ranking is achieved when all key voices are fully involved enabling significant opportunities for active and collaborative stewardship. Constraints in achieving success are as a result of ‘limited long term financial and institutional commitment’ (Satterfield 2013 *et al.* p111). This need for economic investment was borne out in survey responses and in stakeholder focus groups calling for greater clarity in information. These all exemplify the importance of the economic and formal institutional dimensions in context-based conservation efforts (Wardell-Johnson 2015). An excellent achievement results when all key voices are fully involved in active and collaborative stewardship with active commitment and on-going oversight (Satterfield *et al.* 2013).

8.3.1 Summary of recommendations emerging from the survey analysis

- Centrality of the role of communication grounded in stewardship theories, as well as monitoring, recognition and exploitation of environmental values in human management and education
 - Including long term enhancing of environmental values for visitors who place low priority on conservation issues broadly and the dingo in particular, seeing the park as a space for play or pleasure, such as boating, fishing and parties
 - Immediate exploitation on the broad base of visitors who do have high environmental values
- Exploiting partnerships with tourism and other sectors to ensure consistent message
- Ensuring shared decision making in park management and co-design of communication
- Exploiting the importance of gateway entrance points to enhance communication
- Increasing institutional will and financial resourcing of communication clarity
- Potential to rebrand K’gari-Fraser Island through focus on education centres and interpretation ethos consistent with its World Heritage listing status.

8.4 Recommendations in relation to human-dingo incidents and their communication

Information on the most contentious elements of dingo management on K’gari-Fraser Island will assist QPWS in being proactive about the messages it sends and public relations it conducts: myths may be countered with clear data, publication and transparency. An empathetic public is more likely to comply with communication and interpretation messages.

The approaches and desired outcomes outlined in section 2.5, Programs, of the 2013 K'gari-Fraser Island Dingo Conservation and Management Strategy (FIDCMS) are sound but broad. They generally address many of the recommendations outlined in the 2013 Ecosure review of FIDMS and some of the concerns of the 2012 Review Steering Committee Report on the Ecosure Review. However, research on which this report is based indicates that some of the approaches outlined in the 2013 FIDCMS have been either unsuccessful, yet to be actioned sufficiently, or need further actions in regard to those Program focus areas to achieve the desired outcomes. Such relevant recommendations and considerations of previous reports are reiterated here.

Improved accuracy and consistency in human-dingo incident data will lead the way for more research to map the placement of incident. Waddy Point, for example, appears a hot spot but cannot be proven without more ongoing GPS data. It can also help rangers avoid lethal management outcomes by incorporating scientific analysis of dingo behaviours and other factors around human-dingo incidents. This information can then be used to effectively dispel future miscommunication and allow QPWS communications and media liaison staff information to present to the media.

8.4.1 Summary of recommendations emerging from the human-dingo incident data analysis

- More consistency in reporting incidents
- More transparency in providing information as to actions taken (particularly in terms of lethal management and presentation of attempts to avoid this outcome)
- More summaries of risks areas compiled for each month/year, including past years, to provide a history of risk locations
- Incident reports to provide GPS coordinates
- Greater collaboration with scientists to access human-dingo incident factors

8.5 Recommendations emerging from the communication medium analysis

Representations of dingoes as only dangerous can be stereotype and therefore less effective than nuanced examples. Dingoes are complex and the issues surrounding them are diverse with a range of stakeholders expressing concerns for their welfare. These diverse views can be harnessed in co-designing of communication. Instead of pushing the catch phrase 'Be *dingo-safe*', QPWS could consider catch-phrases such as 'Think Dingo': presenting messages with positive overturns can increase communication efficacy. In almost all effective change communication campaigns, the 'edutainment' aspect is emphasised. In most recent brochures and signage there are positive steps in these directions in terms of empathetic and affective communication. But there is room to enhance a balance of education and entertainment on the complexity of the dingo and still convey the safety message. This may involve associated the dingo with island's history and culture as well as its ecological value.

Given the distinct differences between value position found in this research a central route may not be effective or appealing enough. Further framing and agenda setting theories indicate that organisations like QPWS have the resources and the power to 'frame' events and influence the news agenda (students in CMN243 did this for QPWS when they staged and managed an event that received news media coverage). While most organisations do not want to talk about the 'bad things' that happen these are nevertheless, discussed on social media sites sometimes becoming viral. Thus, discussing some past events – like dingo attacks – represented from the victim perspective would provide a central route for others to expound through social media. Directing an appropriate discursive narrative has a greater potential to achieve good publicity even if it is not positive rather than meaningless rhetoric.

Overall, there is consistency in the delivery of messages and images but this is not reflective of reality. The real world of the dingo is complex and diverse. The Dingo can be presented in culturally and historically iconic ways. Ongoing monitoring and evaluation of online and offline messages, images and conversations is required (see Sheehan & Xavier 2014).

A more culture-centred approach to the online representation of dingoes would benefit QPWS. Increased association of dingoes with traditional owners and telling stories about this cultural association enhances online narratives for public consumption. In addition, linking this iconic animal with a culture enhances a sense of relational value. The web page requires substantial updating including:

- Production of research and use of up to date research on the K'gari-Fraser Island dingo particularly
- Clear and easy to access information rather than densely packed multiple linked sites
- Room to construct creative and vicarious access to dingo experiences and downplaying expectations of interacting with real dingoes on K'gari-Fraser Island
- Nuancing of safety message to ensure positive compliant not fear, focus on empathy and respect for iconic predator
- Move away from defensive into positive and proactive branding of message
- Updating of technology possible in web pages
- Updating and clarifying of the safety video on the web so it is accessed first.

Creative and sectorally differentiated signage could be generated through partnerships with a range of public relations and communications university researchers and students. This would provide 'new eyes' and a more diverse range of insights into the communications pathways necessary to reach a wider range of visitors. Recommendations arising from a review of 35 signs about dingoes on K'gari-Fraser Island provided by QPWS are as follows.

- In consultation with stakeholders develop a branded sign hierarchy from more detailed interpretive messaging about dingo significance and ecology to shorter, more direct signage focused on appropriate behaviour to protect dingoes and people, including a mix of proscriptive, prescriptive and narrative-styled messages. Ensure key messages and narratives are clearly identified.
- There were several different brands in evidence. Ensure branding is consistent across signs including interpretive and graphic design elements such as colour palette, font style and size, thematic development, heading and subheading treatment, presentation of graphics (photos and drawings) and logos. As budgets allow, replace older signs with the new brand.
- The strongest safety messages were signs that creatively used drawings showing appropriate and inappropriate behaviour with a green tick or red cross. They are easy to read and quick to absorb.
- All signs should be updated for consistency and multipronged attempts to appeal to different visitor values. Future signs ensure that the amount of information and visuals used are rationalised, graphic design is kept simple and clear and that the purpose of the sign has been clearly identified. QPWS can consider separating information on dingo ecology from information on appropriate behaviour (Weiler et al, 2015).
- This review of signage reveals opportunities for enhanced communication, ideally in partnership with tourism and research stakeholders.
- There were no signs that mentioned the relationship between Butchulla people and dingoes. Inclusion of this information would deepen visitor appreciation of dingoes and is culturally necessary.

This is a definite opportunity to exploit in partnership with tourism and research stakeholders in the region. As the availability for wireless access increases, apps will be the ideal way to provide on-location information, similar to the QR coding process and extend citizen science opportunities. This can be achieved through partnerships with research and higher education institutions, NGOs active in conservation on the Island, the medical services sector and the bushfire/ emergency services groups.

The backpackers exploiting Social Media stories about the dingo in the PR event staged by USC students in 2015 was passed around. Backpackers shared their knowledge in inclusive ways and posted their memories of the fun and learning. Types of social media pages for different communities could be usefully exploited.

8.5.1 Summary of recommendations emerging from the communication data commentary

- Need to evaluate and monitor media on dingo to inform communication planning and dexterity
- Proactive engagement with media rather than defensiveness or responsiveness

- Engagement with communication partnership (university, tourism, stakeholder, visitor experiences) to enhance authenticity and efficacy of communication forms
- Comprehensive auditing of current media and removal of inconsistent or out of date material
- Design enhancement and decluttering of communication media
- Brand consistency: exploiting symbols and clear communication not textually heavy for safety communication
- Avoid using media to communicate messages with mixed intent
- Increased use of narrative and affect / emotion in some communication media to create a conservation ethos and human empathy.

9 Conclusions

This report is the result of a year-long project started in May 2015. It was commissioned by the Department of Science, Information Technology, Innovation and the Arts' 2014 Fraser Island Dingo Research Program. It set out to evaluate the Queensland Parks and Wildlife Service's (QPWS) communication of Fraser Island Dingo Management Strategy (FIDMS, 2012) and *dingo-safe* message, via an analysis of key human interactions, responses and values that represent the K'gari-Fraser Island dingo.

It addressed these objectives through a critical review international literature through peer-reviewed journal articles, wildlife management reports and webpages of similarly World Heritage listed parks and wildlife management agencies. The field research drew on a range of instruments to identify visitor and stakeholder responses via survey, interview and focus group data gathering instruments. All focused on responses to the QPWS *dingo-safe* message and valuing of the K'gari-Fraser Island dingo.

This process involved ongoing communication with QPWS regional management staff who provided samples of communication media, policy history, permits to access the Island and assisted with organising of ranger focus groups. The rangers participated in these focus groups and provided feedback on the survey instrument used to gauge (visitors' and others') perceptions of dingoes, management and communication of the *dingo-safe* message. These surveys were conducted both online (the link was given to visitors to complete later) and in person while researchers were on site visitors in 2015 and 2016. Focus groups were also held with representatives from the Butchulla Indigenous community. In addition, interviews were conducted with representatives from:

- Fraser Island Residents Association
- Fishing community
- Tourism sector
- Fraser Island Natural Integrity Alliance
- Save the Fraser Island Dingo Organisation
- diverse scientific expert positions (5)

The research found K'gari-Fraser Island presents a highly contested area of dangerous animal management. There is much that is anomalous in the K'gari-Fraser Island situation in terms of its reflection of dangerous animal management practice internationally. The key differences are: a current inability to control viewing of dingoes, and difficulties in policing human-animal proximity. A lack of knowledge over visitation numbers and no control over park entry points make the K'gari-Fraser Island context distinct from other parks and nature reserve areas examined in the literature.

Additionally, in many cases internationally, human positions are polarised between control (utilitarian or dominionistic) versus protection ('right to exist' or symbolic values) attitudes to wildlife. The K'gari-Fraser Island visitor surveys and stakeholder interviews conducted for this research reveal that unlike many other places internationally, the majority of stakeholders define themselves as pro dingo and support dingo conservation. But there is great discursive schism around how to semantically define pro dingo positions. And there is evidence that there exist people who intentionally harm dingoes whilst on the Island. Yet, given these differences there are clear synergies emerging from the different forms of data. These are presented in tabular form and points of connection are demonstrated through like colour coding.

9.1 Summary of recommendations

Table 5 provides a succinct summary of the specific recommendations emerging as key priorities for action across this research base

Table 5: Summary of recommendations by detailed activities

| Recommendations | Detailed activities |
|---|--|
| Risk intervention | <p>A communication and community engagement plan be developed, regularly updated and enacted</p> <p>More fenced camping / eating areas for camp groups, backpacker groups, and tag-along tours</p> <p>Increased visitor briefings on <i>dingo-safety</i>, current risks and risk areas, and community involvement in creating these briefings</p> <p>Increased enforcement of fines for non-compliance of regulations related to dingoes (ie feeding, rubbish)</p> |
| Communication enhancement and infrastructure | <p>Develop the communication sections of the 2014 FIDMS implementation document and finalise the draft communication and education implementation document</p> <p>Reduce expectation of visitors seeing / interacting with a dingo and collaborate with tourism industry and other community groups and stakeholders to present this consistent message</p> <p>Update the <i>dingo-safe</i> strategy incorporating a more culturally consultative, narrative-based and affect-appeal process (that is, appealing to emotional connections and responses) focussing on positive human behaviours and natural (not essentialised) dingo behaviours</p> |

| | |
|--|--|
| | <p>Be proactive in the presentation of the dingo story through collaborating with various stakeholders in the area of conservation and avoid responsive / defensive communication in all medium</p> <p>Reinstate safety information conveyed on ranger guided tours, campground ranger information / host programs (including campground briefings) and consider collaboration with community volunteers and Indigenous operators in these roles</p> <p>Extend programs run by QPWS for all commercial tourism operators</p> <p>Incorporate peripheral communication strategies, such as community festivals, promotions or celebrity promotion</p> <p>Use university and commercial partnerships to enhance consistent communication campaigns</p> <p>Exploit the USC backpacker community event regularly at times of most danger (holiday periods)</p> <p>Conduct regular sign audits (including removal of signs) and ensure signs have cohesion, hierarchal clarity and narrative / affect-appeal</p> <p>Develop new technologies beyond the broader QPWS Facebook page (apps, for example)</p> |
| Detailed participatory activities: stakeholder engagement and community collaboration | <p>Employ adaptive and collaborative approach to wildlife management as world's best practice and promote this process in the media</p> <p>Increase concept mapping using stakeholder forums to improve authenticity of communication for various target audiences</p> <p>Increase recognition of, and communication with, traditional owners</p> <p>Fostering participatory engagement of all stakeholders is vital in wildlife decision-making processes and community engagement with policy development</p> <p>Restore dingo advisory group</p> <p>Hold an annual inclusive meeting for all stakeholder representatives and increase citizen science activities</p> |
| Research and data collection | <p>Conduct research into ongoing media analysis and evaluation to guide communication planning</p> <p>Conduct ongoing research to inform management and communication strategies incorporating social science research paradigms of persuasion theory (subtly changing the attitudes of message receivers), conflict resolution and human conditioning</p> <p>Understand lethal management as constituting impact to public relations</p> |

| | |
|--|--|
| | <p>and communication efficacy. Counter this with evaluation of and in depth research into these areas that are then proactively publicised</p> <p>Increase regular research and accurate data gathering regarding dingo populations to inform management policy and stakeholders via transparent communication</p> <p>Increase regular research and accurate base-line data provided regarding visitors to the Island (i.e.. numbers, demographics, country of origin, awareness of dingo issues and perceptions of risk. Is it, for example, that dingoes are misbehaving or that the human population is escalating at high risk times?</p> <p>Broaden research into dingo behaviour and what constitutes 'normal behaviour' to be considered in dingo management policy</p> <p>Provide and maintain transparent (publicly available) and clear data on lethal management rates, fencing and other management methods and their outcomes</p> <p>Incident reports to be consistent, include dingo sightings (including Codes A & B) and GPS coordinates for explicit purpose of future research</p> <p>Increase summaries of risk areas compiled for each month / year, including past years, to provide a history of risk locations to inform management strategy and policies</p> <p>Standardise and store data for ease of access and analysis. Make much of the data publicly available</p> <p>Audit signs and brochures and update all communication media</p> |
|--|--|

Table 6 compares the summaries of recommendations from the literature review, stakeholder analysis, survey analysis and brief analyses of human-dingo incident and communication media currently in use. It reveals a strong patterning of the theme of adaptive managements, partnerships and co-designing of communication material.

There is consistency across the data analysed on the need for more comprehensive research and data keeping on the part of QPWS and the need for QPWS to be more proactive and forthright in promoting that research and their role as conservation experts on K'gari-Fraser Island.

There is a consistent recommendation emerging from the analysis for more stewardship and conservation to be exploited using affective and narrative forms, while maintaining clarity over the safety message.

Table 6: Summary of recommendation compared by source

| Recommendation Category | Recommendation | Research source |
|--------------------------|--|-------------------------|
| Participatory engagement | Interpretation approaches that call upon human visitors and stakeholders to engage with parks and the non-human animals who reside there as stewards and conservationists: strategic word choices focusing on the human role in conservation | Literature review |
| | More stakeholder involvement and consultation in development of management strategies; adaptive (changing with consultation) and participatory management approaches | Stakeholder analysis |
| | Ensuring shared decision making in park management and co-design of communication; participatory co-development of communication and education material | Survey analysis |
| | Increase QPWS collaboration with tourism sector | Survey analysis |
| | More stakeholder involvement and consultation in interpretation and communication activities; for example, Butchulla guided tours or safety education and volunteer education | Stakeholder analysis |
| | Incorporating citizen science approaches; engagement with formal education in terms of harnessing schools and teachers for long term attitudinal change | Literature review |
| | Engagement with communication partnership (university, tourism, stakeholder, visitor experiences) to enhance authenticity and efficacy of communication forms | Communications analysis |
| | Incorporating peripheral communication using volunteers and partnerships | Literature review |
| Stewardship development | Centrality of the role of communication grounded in stewardship theories, as well as monitoring, recognition and exploitation of environmental values in human management and education | Survey analysis |
| | Immediate exploitation of the broad base of visitors who do have high environmental values | Survey analysis |

| | | |
|---|---|---|
| | Increasing institutional will and financial resourcing of communication clarity and interpretation branding | Survey analysis |
| | Emotionally engaging, active / participatory, logical, thematically consistent and hierarchal ordered communication that is visually clear | Literature review And Communications analysis |
| | Potential to rebrand K'gari-Fraser Island through focus on education centres and interpretation ethos consistent with its World Heritage listing status | Survey analysis |
| | Greater focus on visitor responsibility | Stakeholder analysis |
| | Increased use of narrative and affect in some communication medium to create a conservation ethos and human empathy | Communications analysis |
| Reporting and research | More consistency in reporting incidents | Human-dingo incident data |
| | More summaries of risk areas compiled for each month / year, including past years, to provide a history of risk locations | Human-dingo incident data analysis |
| | Increase in quality and depth of data gathered | Human-dingo incident data analysis |
| | Greater collaboration with scientists to access human-dingo incident factors | Human-dingo incident data and stakeholder analyses |
| | Maintaining baseline data on many aspects of management, including animal and visitor numbers, management actions and resources lost | Stakeholder analysis |
| | Disseminating research and pro-active engagement of media | Communication analysis and literature |
| | Increased research into dingo population and its sustainability | Stakeholder analysis |
| | Need to evaluate and monitor media on dingo to inform communication planning and dexterity | Communication analysis |
| | Proactive engagement with media rather than defensiveness or responsiveness | Communications analysis |
| Resourcing and infrastructure (grey) | Exploiting the importance of gateway entrance points to enhance communication | Survey analysis |
| | Comprehensive auditing of current media and removal of | Communications analysis |

| | | |
|--|--|--|
| | inconsistent or out of date material | |
| | Increase in Ranger resourcing and presence | Survey analysis and Stakeholder analysis and Literature Review |
| | Design enhancement and decluttering of communication medium | Communications analysis |
| | Brand consistency: exploiting symbols and clear communication not textually heavy for safety communication and avoid media with mixed intent | Communications analysis |

The recommendations summaries indicate a pervasiveness of ethical considerations affecting the perception of management practice and the efficacy of communication practice, as well as the need for widespread increases in resources to ensure any form of institutional change and support for change.

Finally, to construct an ongoing communication implementation plan there needs to be ongoing consultation and continued processes of communication assessment. It appears that QPWS has taken a somewhat staccato approach to the evaluative and consultative processes, probably due to resourcing issues. An ideal form of communication evaluation and implementation is to move in continuous cycle from inputs to outputs to process outtakes to summative outtakes (Mahoney, 2013: 211). See table 7.

K'gari-Fraser Island is a highly significant site in the QPWS suite of parks management areas. Its ecosystems and pristine beauty mark it as extraordinary on an international scale: rainforests growing on sandy dunes, rainbow sands, a crucial breeding site for hundreds of bird species, countless mammals and reptiles, including rare and vulnerable species. Its geomorphology is also rare and ecologically significant.

Dingoes are crucial to the ecosystem and the environmental values with which people associate K'gari-Fraser Island. Dingoes are also a factor in the World Heritage listing of the Island, which marks the park as globally significant. The high volume of visitors to the Island means that human-focussed strategies must form part of overall park management. Improved communication and education of visitors will allow them to safely enjoy and celebrate the Island's wonders, whilst ensuring the conservation of these iconic predators.

Appendices

Appendix 1: Focus questions for stakeholder interviews and focus groups

RESEARCH PROJECT INFORMATION SHEET



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Purpose

You have been invited to take part in this project because you are a representative of a stakeholder group with interest in how K'gari-Fraser Island dingoes are valued, understood and interacted with. The goals of this research are to explore human-dingo interactions and the values human beings place on these interactions. The project is funded by Queensland Department of Information Technology Science Innovation and the Arts, in partnership with Queensland Parks and Wildlife Services (QPWS). If you agree to take part in this research, you will be asked to complete a brief series of survey questions, which should take no more than approximately 7 minutes to complete.

Researchers

The research team consists of Chief Investigator Dr Clare Archer-Lean (University of the Sunshine Coast - USC), Associate Professor Jen Carter (USC), Dr Angela Wardell-Johnson (Curtin University), Dr Umi Khattab (USC), Dr Sanjeev Kumar Srivastava (USC) and Dr Inez Mahony (USC).

Risks and benefits

There are no specific risks involved in the research project. You will receive the benefit of participation in valuable research and have your viewpoints inform management and communication of K'gari-Fraser Island dingoes.

Participation and consent

Participation in the research is voluntary and you may discontinue at any time without penalty. You will be asked to sign a consent form prior to participating in this research.

Consent is for the use of your comments and reflections in this project as well as future related research projects.

Confidentiality and results

Your responses to the questions will not identify you in any publications or presentations arising from the research. The chief investigator, Clare Archer-Lean or a nominee from the team, will be present to assist facilitation of research, but no record of any identifying information will be placed with responses. Results will be published in a final report and journal articles, and presented at conferences. Results will also be used to inform QPWS future communication with the community. Participants are welcome to contact Dr Clare Archer-Lean for advice on the date of publication of any final report and how to access it.

Dr Clare Archer-Lean

Email: carcher@usc.edu.au

Phone: 07 54565029 (email is preferred contact)

Complaints / Concerns

If you have any complaints about the way this research project is being conducted you can raise them with the chief investigator. If you prefer an independent person, contact the Chairperson of the Human Research Ethics Committee at the University: (c/- the Research Ethics Officer, Office of Research, University of the Sunshine Coast, Maroochydore DC 4558; telephone (07) 5459 4574; email humanethics@usc.edu.au).

The researchers and the University of the Sunshine Coast thank you for consideration of this study.

PLEASE TEAR OFF THIS PAGE AND RETAIN FOR YOUR RECORDS

CONSENT TO PARTICIPATE IN THIS RESEARCH

I have read, understood and kept a copy of the Research Project Information Sheet for the above research project.

I realise that this research project will be carried out as described in the Research Project Information Sheet, a copy of which I have kept.

Any questions I have about this research project and my participation in it have been answered to my satisfaction.

I agree to participate in the research project on human and dingo interaction

I give consent for data about my participation to be used in a **confidential** manner for the purposes of this research project, and in future research projects.

Participant signature

Date

Print name _____

Questionnaire

1. Fraser Island is a place where.....

Choose only 3 categories ranking the most important as 1, second most important as 2 and the third most important as 3

| | |
|--|--|
| People can use the environment for their recreation needs | |
| The environment is managed for conservation with advice from scientists and experts | |
| The environment is under pressure from people | |
| The needs of future generations for engagement with nature are considered sustainably | |
| The needs of the natural environment are considered within the limitations of the planet | |
| The forces of nature show that people can only exist as an integral part of nature | |

2. Who is responsible for solving environmental problems on Fraser Island?

Choose only 3 categories ranking the most important as 1, second most important as 2 and the third most important as 3

| | | | |
|------------------------------|--------------------------|---|--------------------------|
| Individuals | <input type="checkbox"/> | Government agencies | <input type="checkbox"/> |
| The community | <input type="checkbox"/> | Australian National Government agencies | <input type="checkbox"/> |
| Society | <input type="checkbox"/> | Queensland Government agencies | <input type="checkbox"/> |
| University/ tertiary sector | <input type="checkbox"/> | Local Councils | <input type="checkbox"/> |
| Non-Government organisations | <input type="checkbox"/> | The Park Managers (QPWS) | <input type="checkbox"/> |
| The business sector | <input type="checkbox"/> | Rangers | <input type="checkbox"/> |
| Industry/ commercial sector | <input type="checkbox"/> | Other: (please name) | <input type="checkbox"/> |

3. Did you obtain information about Fraser Island and its dingoes before you arrived?

Circle YES or NO

4. Please indicate where you got your information about Fraser Island and rate the usefulness of the information you received:

| | NOT USEFUL | USEFUL | VERY USEFUL |
|--|---------------|--------|----------------|
| Fraser Island rangers & QLD Parks & Wildlife staff | | | |
| National Parks information centre/ noticeboard | | | |
| Tour business | | | |
| Four wheel drive company | | | |

| | | | |
|------------------------------|--|--|--|
| Accommodation place or staff | | | |
| Online web pages / brochures | | | |
| Online social media | | | |
| Signage on the Island | | | |
| Travel guide / travel book | | | |
| Media – radio, TV, newspaper | | | |
| Friends or family | | | |
| Fraser Island resident | | | |
| OTHER: please name here | | | |

5. What are your most important media sources of information and communication about Fraser Island? **Choose only 3 categories. Rank first most important 1, second most important 2 and third most important 3**

| | | | |
|-------------------------------------|--------------------------|----------------------|--------------------------|
| TV/ Radio | <input type="checkbox"/> | Tourism websites | <input type="checkbox"/> |
| Government websites | <input type="checkbox"/> | Social media | <input type="checkbox"/> |
| Newspapers and magazines | <input type="checkbox"/> | Online forums | <input type="checkbox"/> |
| Environmental organisation websites | <input type="checkbox"/> | Other: (please name) | <input type="checkbox"/> |

6. What are your most important non-media sources of information and communication about Fraser Island? **Choose only 3 categories ranking 1 as most important , 2 as second most important and 3 as third most important.**

| | | | |
|-----------------------------|--------------------------|--|--------------------------|
| Your family | <input type="checkbox"/> | Local commercial suppliers/ shop owners | <input type="checkbox"/> |
| Your friends | <input type="checkbox"/> | Tourism agencies | <input type="checkbox"/> |
| Your neighbours | <input type="checkbox"/> | Local Council information | <input type="checkbox"/> |
| Environment groups | <input type="checkbox"/> | Queensland government information | <input type="checkbox"/> |
| Rangers | <input type="checkbox"/> | Australian National government information | <input type="checkbox"/> |
| University/ tertiary sector | <input type="checkbox"/> | Other: (please name) | <input type="checkbox"/> |

7. Have you received a permit pack containing brochures about Fraser Island? **Circle** YES or NO
8. Did you read the information before arrival to Fraser Island? **Circle** YES or NO

9. Do you expect to encounter dingo/es on Fraser Island?

Circle YES or NO

10. Do you think dingoes are dangerous? **Circle only one category**

| | | | | |
|---------------|--------------------|-----------|----------------|---------------------|
| Not dangerous | A little dangerous | Dangerous | Very dangerous | Extremely dangerous |
|---------------|--------------------|-----------|----------------|---------------------|

11. Do you have concerns/worries about dingoes and safety? NO / YES **please explain**

| |
|--|
| |
| |

12. Do you have concerns/worries about dingo welfare? NO / YES **please explain**

| |
|--|
| |
| |

13. What level of risk are you prepared to take with a dingo? **Circle all categories that apply to you**

| | | | | | |
|-----------------------------------|--------------------------------------|--------------|-------------------|---------------------|--|
| observe from a safe distance only | Get close enough to get a good photo | Feed dingoes | Play with dingoes | Pat / touch a dingo | Chase dingo away by waving arms or throwing things |
|-----------------------------------|--------------------------------------|--------------|-------------------|---------------------|--|

14. Have you previously encountered a dingo /dingoes on Fraser Island?
or NO

Circle YES

If YES, where? **Tick all that apply**

| | | | |
|---|--------------------------|-------------------------------|--------------------------|
| At a ferry landing point | <input type="checkbox"/> | Near an unfenced settlement | <input type="checkbox"/> |
| On an eastern beach | <input type="checkbox"/> | In an unfenced settlement | <input type="checkbox"/> |
| On a western beach | <input type="checkbox"/> | In a camp site | <input type="checkbox"/> |
| In the bush | <input type="checkbox"/> | Near a camp site | <input type="checkbox"/> |
| On a track | <input type="checkbox"/> | Near someone fishing | <input type="checkbox"/> |
| In a visitor site (eg Lake McKenzie/ Eli Creek) | <input type="checkbox"/> | Near someone swimming | <input type="checkbox"/> |
| Near a visitor site | <input type="checkbox"/> | Near someone walking/ running | <input type="checkbox"/> |
| In a fenced settlement/ camping area | <input type="checkbox"/> | Near parked vehicles | <input type="checkbox"/> |

| | | | |
|--|--------------------------|----------------------|--------------------------|
| Near a fenced settlement/ camping area | <input type="checkbox"/> | Other: (please name) | <input type="checkbox"/> |
|--|--------------------------|----------------------|--------------------------|

15. Where have you seen advice on how to behave when encountering dingoes?

Please only rank the usefulness of the information you have accessed

| | NOT USEFUL | USEFUL | VERY USEFUL |
|--|---------------|--------|----------------|
| QLD Parks & Wildlife information pack/ brochures | | | |
| National Parks information centre/ noticeboards | | | |
| Tour business brochures | | | |
| Four wheel drive company brochures | | | |
| Accommodation place or staff information | | | |
| Online web pages / brochures | | | |
| Online social media | | | |
| Signage on the Island | | | |
| Travel guide / travel book | | | |
| Media – radio, TV, newspaper | | | |
| Information from friends or family | | | |
| Information from Fraser Island resident | | | |
| OTHER: please name here | | | |

16. From your personal point of view, are these statements true or false?

| | DEFINITELY TRUE | PROBABLY TRUE | PROBABLY FALSE | DEFINITELY FALSE | UNSURE |
|---|--------------------|------------------|-------------------|---------------------|--------|
| Parents should keep small children close, but older children are safe when alone | | | | | |
| Walking alone on or near the beach is a risk for adults | | | | | |
| Walking in groups is recommended as a safety precaution because dingoes roam all over the Island. | | | | | |
| It's OK to go close to dingoes to get a good photo | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| Dingoes can herd people into the sea | | | | | |
| I know enough to tell my children (or group members) how to behave if they encounter a dingo on Fraser Island | | | | | |
| Dingoes are very much like pet dogs | | | | | |
| | | | | | |
| You shouldn't feed dingoes fruit or bread but meat products are ok | | | | | |
| Dingoes like to eat cooking oil, food wrappers, vegetables, soap & leather shoes | | | | | |
| Dingoes that look thin are likely to be very hungry | | | | | |
| Dingoes can open iceboxes | | | | | |
| It is important to store food carefully | | | | | |
| Some campsites have food lockers for securing food | | | | | |
| My group has talked about special care in storing food on the Island | | | | | |
| Dingoes on Fraser Island are hunters and can find natural food for themselves | | | | | |
| There are large fines (up to \$4000) for feeding dingoes | | | | | |
| There are large fines for leaving food or rubbish lying around | | | | | |
| I don't know enough about wild dingo behaviour yet | | | | | |
| | | | | | |
| Fraser Island dingoes are becoming extinct | | | | | |
| All dingoes on Fraser Island are 'pure' | | | | | |
| There are 'pure' dingoes on mainland Australia | | | | | |
| Fraser Island dingoes are more important than mainland dingoes | | | | | |
| Dingoes are a threat to the environment | | | | | |
| Dingoes play an important role in the eco-system on Fraser Island | | | | | |

| | | | | | |
|--|--|--|--|--|--|
| Dingoes are protected by legislation in protected areas (such as national parks) | | | | | |
| Dingoes are protected by legislation outside areas such as national parks | | | | | |
| Dingoes are wild (cannot be tamed) | | | | | |
| Dingoes are dangerous | | | | | |
| Dingoes belong as symbols of wild Australia (and should be protected) | | | | | |
| Dingoes are pests | | | | | |
| Dingoes belong as domestic companions in Indigenous communities | | | | | |
| Dingoes are a part of the tourist experience | | | | | |

17. Where have you lived most in the past five years?

| | | | |
|-------------------------------|--------------------------|-----------------------------|--------------------------|
| On Fraser Island | <input type="checkbox"/> | In Brisbane | <input type="checkbox"/> |
| In regional town/ city in Qld | <input type="checkbox"/> | In another city outside Qld | <input type="checkbox"/> |
| In a rural area in Qld | <input type="checkbox"/> | Another country | <input type="checkbox"/> |
| In a rural area outside Qld (| <input type="checkbox"/> | Other: | <input type="checkbox"/> |

18. What is your main occupation?

19. Gender? **FEMALE** **MALE**

20. What is your age bracket?

| | | | | | |
|--|-------|-------|-------|-------|-----|
| 21. Please state your nationality? _____ | 18-24 | 25-39 | 40-64 | 65-79 | 80+ |
|--|-------|-------|-------|-------|-----|

22. What is your main reason for being on Fraser Island?

| | | | |
|--|--------------------------|---------------------------------------|--------------------------|
| Resident of Fraser Island | <input type="checkbox"/> | Visitor on a large tour bus | <input type="checkbox"/> |
| Small business operator | <input type="checkbox"/> | Visitor on a small tour bus | <input type="checkbox"/> |
| Government agency staff member | <input type="checkbox"/> | Tag-along-tourist (guided self-drive) | <input type="checkbox"/> |
| QPWS (Ranger/ Management) | <input type="checkbox"/> | Self-drive tourist | <input type="checkbox"/> |
| Tourism Business Operator | <input type="checkbox"/> | Camper | <input type="checkbox"/> |
| Tourism service sector (hospitality etc) | <input type="checkbox"/> | Fishing | <input type="checkbox"/> |
| Traditional Owner | <input type="checkbox"/> | Walking/ hiking/ cycling | <input type="checkbox"/> |

| | | | |
|-----------------------------------|--------------------------|------------------------------------|--------------------------|
| Researcher/ Tertiary Student | <input type="checkbox"/> | Water based activity (boating etc) | <input type="checkbox"/> |
| NGO/ Environmental service sector | <input type="checkbox"/> | Other: (please name) | <input type="checkbox"/> |

23. How many times have you been to Fraser Island? *please tick only one category*

| | 1 visit | 2–5 visits | 6–10 visits | 10+ visits |
|----------------------|---------|------------|-------------|------------|
| in the past year | | | | |
| in the past 5 years | | | | |
| in the past 10 years | | | | |
| in the past 20 years | | | | |
| for over 20 years | | | | |

24. Are you staying overnight on the Island? **Circle** YES or NO

25. If YES, what kind of accommodation are you using? *Circle the category that applies*

| | | | | | |
|-----------------|---------|-------|---------------------------|---------------------|---------------------|
| Bed & breakfast | camping | cabin | Hotel/ resort / apartment | backpacker / hostel | private residential |
|-----------------|---------|-------|---------------------------|---------------------|---------------------|

26. If you are staying on the Island, how long will you stay on the Island this trip?

| | | | | |
|-------------------------------------|----------|----------|-----------|-------------------|
| Today is the first day of this trip | 1-3 days | 3-7 days | 7-14 days | More than 14 days |
|-------------------------------------|----------|----------|-----------|-------------------|

27. Please provide any relevant comments or suggestions

| |
|--|
| |
| |
| |

Thank you

Appendix 2: Focus questions for stakeholder interviews and focus groups

Interview Guide for Focus Group and semi-structured interviews

Participants from various stakeholder groups will be interviewed for no more than one hour in a focus group discussion or individually.

The purpose of these interview discussions are to gather data on the way various stakeholders and interests value and expect to interact with dingoes.

The decision to interview or use focus group will be determined by most appropriate format required by the group. For example QPWS rangers have requested we attend one of the group ranger meetings on the Island to speak with them together, but the Butchulla PBC have requested discussions at the meetings *and* in personal, individual on country interviews where recorded information is then approved after by the participant.

During discussions with **broader stakeholder groups including Fraser Island Natural Integrity Alliance and Fraser Island residents** the interviewer will try to draw out information related to the following research questions:

The questions will focus on:

- Participants' opinion of the Queensland Parks and Wildlife Services' (QPWS) Fraser Island Dingo Management Strategy (FIDMS) and key education messages (see below)
- How participants feel about conservation of the dingo and their cultural value
- Whether the FIDMS is effective in meeting its objectives (see below)
- Suggestions on improving strategies and effectiveness of communication to the public

During discussions with **QPWS staff / rangers** the interviewer will try to draw out information related to the following:

- Participants' opinion of the Queensland Parks and Wildlife Services' (QPWS) Fraser Island Dingo Management Strategy (FIDMS) and key education messages (see below)
- Education and training QPWS staff have in relation to dingo behaviour, management and communication of these with the public
- Resources - adequate or not to achieve FIDMS objectives (enforce and educate visitors and residents)
- Participants opinions on what is thwarting achieving objectives and communicating key messages of the FIDMS
- High incident areas suggestion for improving communication about and management of those areas
- Suggestions on improving strategies and effectiveness of communication with the public

During discussions with **tour operators** the interviewer will try to draw out information related to the following:

- Participants' opinion of the Queensland Parks and Wildlife Services' (QPWS) Fraser Island Dingo Management Strategy (FIDMS) and key education messages (see below)
- High incident areas suggestion for improving communication about and management of those areas
- How participants are promoting FIDMS messages and educating public
- How they perceive their clients responses to the FIDMS message
- Suggestions on improving strategies and effectiveness of communication to the public

During discussions with **the Fraser Island Butchulla traditional owners** the interviewer will try to draw out information related to the following:

- Participants' opinion of the Queensland Parks and Wildlife Services' (QPWS) Fraser Island Dingo Management Strategy (FIDMS) and key education messages (see below)
- Knowledge of dingo behaviours based on long oral history and custodianship and opinions of best practice in dingo and human management
- Suggestions on improving strategies and effectiveness of communication to the public based on their observations of dingo-human interaction
- Suggestions on improving strategies and effectiveness of dingo management based on their observations of dingo-human interaction
- How might effective communication and/or management vary between different places e.g. campgrounds, beaches, national park, resorts, or townships?

Objectives of the FI Dingo Management Strategy (2006 in Ecosure 2012 FIDMS Review):

People living, working or visiting Fraser Island are:

1. Aware of natural dingo behaviour, including likelihood of habituation, attraction and potential aggression towards humans
2. Alert to the potential dangers that dingoes may pose, especially towards children
3. Active in behaviours that minimise risk:
 - Refrain from feeding
 - Refrain from inadvertent feeding
 - Behave 'safely' around dingoes
4. Attentive to individual dingo characteristics for ID purposes
5. Provide visitors with a safe, enjoyable opportunity to view dingoes in an environment as near as possible to their natural state
6. Reduce the risk posed to humans by dingoes to an acceptable low level
7. Reduce the frequency and intensity of aggressive and destructive behaviour by the Island dingoes towards visitors and local residents

KEY MESSAGES (in ECOSURE 2012 - FIDMS Review)

- Dingoes are wild and unpredictable; seasonal behaviour
- How to behave in relation to dingoes
- Keep food secure, clean up after cooking, secure fish/bait/berley
- It is an offence to feed dingoes
- Report dingo incidents
- Dingo ID tips

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